# ACCOUNTING and CONTROL 2019 EDITION

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## COST ACCOUNTING AND CONTROL 2019 Edition

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### COST ACCOUNTING AND CONTROL

By

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#### PREFACE

This text is designed for a dual purpose. First, it is intended to introduce undergraduate students to the financial aspects of Cost Accounting. Second, it is organized to serve the needs of reviewees for the CPA board examinations in Advanced Financial Accounting and Reporting (AFAR)

The discussions and illustration are focused not only on product costing – cost accumulation and cost allocation but also on the managerial uses of cost accounting information

Major discussions are on such topics as job order costing, process costing, joint-products, and standard costing, all of which adequately illustrate concepts and procedures in cost accumulation and cost allocation. Also now included are a discussion of Just=in=Time technology, Activity Based Costing and Cost Volume Profit analysis

All three types of business organizations need cost accounting information for decision-making functions. However, manufacturing organizations offer a more intricate network of cost concepts and procedures that it is chosen as basis for much of the discussions. To serve the needs of CPA reviewees, materials often tested in the board examinations are adapted. Some items are also taken from other published sources to bring added comprehensiveness with the problem-solving exercises. It is made certain that concepts addressing these varied accounting situations are found in the text to allow self-instructional learning methods

It is hoped this little effort will serve the needs of interested users.

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#### INTRODUCTION TO COST ACCOUNTING

#### LEARNING OBJECTIVES

Upon completion of this chapter, you should be able to:

- Distinguish between financial, managerial, and cost accounting
- Distinguish between merchandising and manufacturing operations
- Identify the uses of cost accounting data
- Distinguish between job order costing and process costing

The main and primary objective of accounting is to provide financial information about an economic entity to different types of users. First we have internal users managers for planning, controlling and decision making. Then we have external users - the government, those who provide funds and those who have various interests in the operations of theof the entity.

Cost Accounting is an expanded phase of general or financial accounting which informs management promptly with the cost of rendering a particular service, buying and selling a product, and producing a product. It is the field of accounting that measures, records, and reports information about costs.

All types of business entities - manufacturing, merchandising, and service businesses - require information systems which provide the necessary financial data. Because of the naturé of the manufacturing process, the information systems of manufacturing entities must be designed to accumulate detailed cost data relating to the production process. Thus, it is common today for small, medium, and large manufacturing companies to have structured costs accounting systems. systems should show what costs were incurred and where and how these costs were Cost accounting today is recognized as being essential to efficient cooperation of business and industry.

In order to appreciate the importance of an efficient cost system, it is necessary to understand the nature of the manufacturing process. In many ways, the activities of a manufacturing organization are similar to those of a merchandising business. Both are concerned with purchasing, storing, and selling goods; both must have efficient management and adequate sources of capital; both may employ hundreds or thousands of workers. In the manufacturing process itself, we see the distinction

between the two: merchandisers, such as SM buy items in marketable form to be resold to their customers; manufacturers, such as PHILACOR, must make the goods they sell. Once the merchandising organization has acquired and stored goods, it is ready to carry out the marketing function. The purchase of materials by a manufacturer, however, is only the beginning of a long, and sometimes complex, chain of events that will eventually produce a finished article ready for sale.

The manufacturing process involves the conversion of raw materials into finished goods through the application of labor and the incurrence of various factory expenses. The manufacturer must make a major investment in physical facilities, such as factory buildings and warehouses, and acquire many specialized types of machinery and equipment. In order to carry out the manufacturing process, the manufacturer must purchase appropriate quantities of raw materials, Supplies and parts, and build up a work force to convert these resources into finished goods. Once the goods are completed and are ready for sale, the manufacturer performs basically the same functions as the merchandiser in storing and marketing the goods. The methods of accounting for sales, cost of goods sold, and selling and administrative expenses are also similar to those of the merchandising organization.

Although cost accounting developed originally in manufacturing business to satisfy management's need for product cost information, cost accounting information is useful for all types of activities in all types of organizations. Cost accounting is essential not only for profit-seeking entities but also for not-for-profit organizations such as governmental agencies, churches, and charities.

Comparison of Financial, Managerial, and Cost Accounting
There are two major areas of accounting – (1) financial accounting and (2)
managerial accounting.

Financial accounting is the use of accounting information for reporting to external parties, including investors and creditors. Financial accounting is primarily concerned with financial statements for external use by those who supply funds to the entity and other persons who may have vested interest in the financial operations of the firm. The suppliers of funds include stockholders (the owners of the corporation) partners (the owners of the partnership) and sole proprietors. Creditors, who provide debts are also interested on the financial statements of the entity. The financial statements are the output from an accounting system. The reports prepared under financial accounting focus on the enterprise as a whole. Financial accounting is based on historical transaction data. The information may be historical, quantitative, monetary and verifiable. The data are historical and are supported by documents (evidence). The information provided by financial accounting is usually

presented in the form of financial statements, tax returns, and other formal reports distributed to various external users. The same information may also be used internally to provide a basis for financial analysis by management. Financial accounting is required for many firms organized as corporations because of the requirements of the Securities and Exchange Commission.

The <u>Bureau of Internal Revenue</u> also requires financial accounting information for compliance with the country's tax laws. Information based on accounting data is required for all firms without regard to their size.

Managerial accounting focuses on the needs of parties within the organization, rather than interested parties outside the organization. Managerial accounting information commonly addresses individual or divisional concerns rather than those of the enterprise as a whole. The information may be current or forecasted, quantitative or qualitative, monetary or non-monetary and most of all timely the data are futuristic and some of the costs are not recorded on the accounting books of the organization

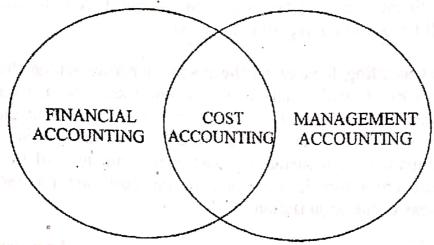
Managerial accounting is not separate and distinct from financial accounting. Financial accounting data are used in the managerial accounting system. Management decisions made today will affect the financial statement of future periods. There is no requirement or legislation that mandates the format or use of managerial accounting. Managerial accounting methods are tools that are available for use to management.

Financial accounting attempts to present some degree of precision in reporting historical information while at the same time emphasizing verifiability and freedom from bias in the information, relevance to the general user and some degree of timeliness in reporting which is not as critical in managerial accounting. The timing of information and its relevance to the decision on hand has greater significance to the internal decision-maker. Management is more concerned on the timeliness of the information so management cannot wait until tomorrow for information that is required for today's decision.

The measuring based in managerial accounting does not necessarily have to be restricted to pesos. Various bases may be appropriate to report managerial information. Examples include: (1) an economic measure such as pesos; (2) a physical measure such as pounds, gallons, tons, or units; and (3) a relationship measure such as ratios..

Cost accounting is the intersection between financial and managerial accounting. Cost accounting information is needed and used by both financial and managerial accounting. Cost accounting provides product cost information to external parties, such as stockholders, creditors and various regulatory boards for credit and investment decisions. Cost accounting provides product cost information also to internal parties such as managers for planning and controlling,

#### Relationship of Financial, Management, and Cost Accounting



#### Merchandising versus Manufacturing Operations

Much of our accounting education has centered on the merchandising organization. Thus, it is important here to explain the difference in accounting for manufacturing firms and merchandising firms. Many types of businesses gather information on costs, but doing so is especially important in manufacturing.

A merchandising company normally buys a product that is ready for resale when it is received. Nothing needs to be done to the product to make it salable except possibly to prepare a special package or display. As shown in Figure 1-1 total beginning merchandise inventory plus purchases is the basis for computing both the cost of goods sold and ending merchandise inventory (MI) balances. Costs assigned to unsold items make up the ending inventory balance. The difference between the cost of goods available for sale and the ending inventory amount is the cost of goods sold during the period. The following example shows the computation.

Beginning merchandise inventory P 5,0	00
Plus: Total purchases	
Cost of goods available for sale 29,0	00
Less: Ending merchandise inventory  Cost of goods sold  23,0  6,5  22,5	
22, 5	00 - got

The example in the previous page and Figure 1-1 show how easy it is to compute the cost of goods sold for a merchandising company. The only expenditure occurs when salable goods are purchased. Any item unsold at year end make up the ending inventory balance. Cost of goods sold is computed by subtracting the ending Inventory (MI end) balance from the total of the beginning inventory balance and purchases during the period.

Figure 1-1. Cost of Goods sold for a Merchandising Company

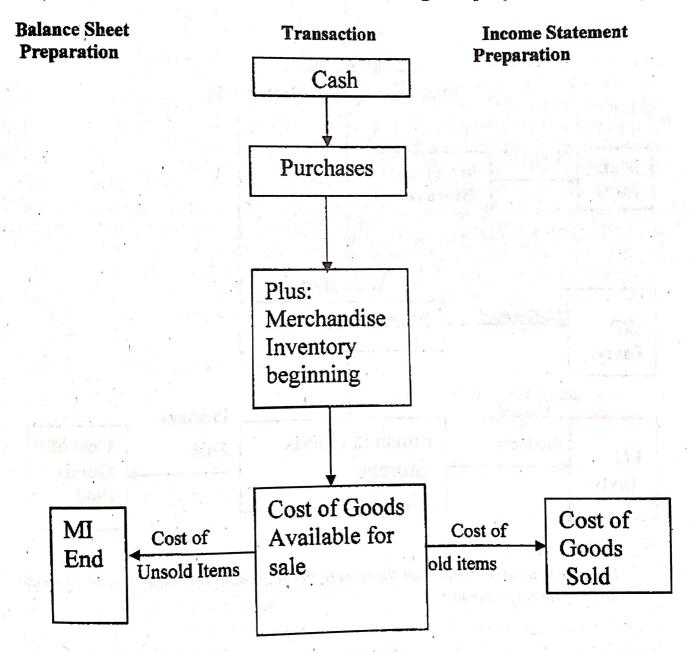
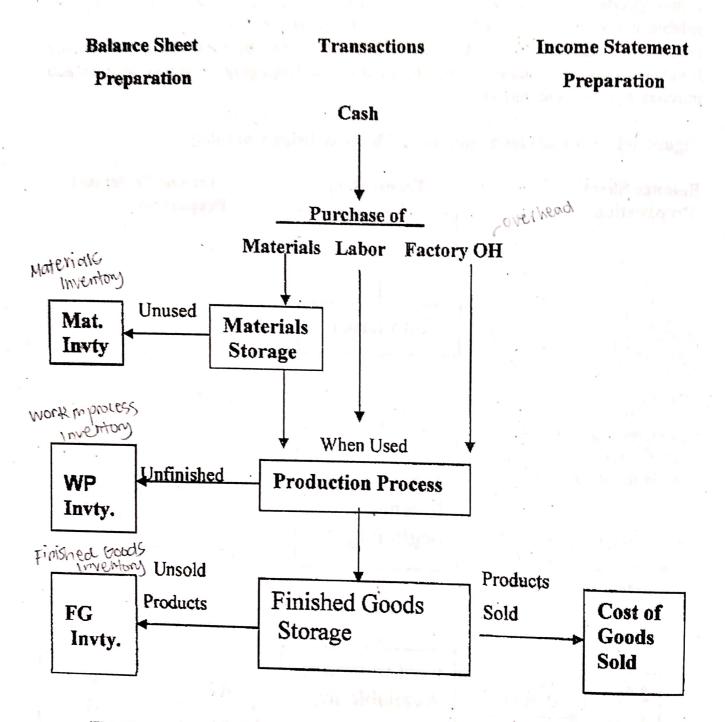


Figure 1-2 Cost of Goods Sold for a Manufacturing Company



The illustration assumes that there were no beginning inventory balances in the three inventory account.

Computing the cost of goods sold for a manufacturing company is more complex. As shown in Figure 1-2 instead of one inventory account, a manufacturer maintains three inventory accounts: (Materials Inventory, Work in Process Inventory, and Finished Goods Inventory. Purchased materials unused during the production process make up the ending Materials Inventory balance. The cost of materials used plus the costs of labor services and factory overhead are transferred to the Work in Process Inventory account when the materials, labor services, and overhead items are used in the production process. (Factory overhead includes such items as indirect materials, indirect labor, utility costs, depreciation of factory machinery, depreciation of factory building, and supplies). The three types of costs mentioned are often called direct materials, direct labor and factory overhead (abbreviated DM, DL, and FO). These costs are accumulated in the Work in Process Inventory (WP Invty.) Account during an accounting period. When a batch or order is completed, all manufacturing costs assigned to the completed units are moved to the Finished Goods Inventory account. Costs remaining in the Work in Process Inventory account belong to partly completed units. These costs make up the ending balance in the Work in process Inventory account. The Finished Goods Inventory (FG Inventory.) Account is set up in the same way as the Merchandise Inventory account under Merchandising. Costs of completed goods are entered into the Finished Goods Inventory account. Then costs attached to unsold items at year end make up the ending balance in the Finished Goods Inventory account. All costs related to units sold are transferred to the Cost of Goods Sold account and reported on the income statement.

#### USES OF COST ACCOUNTING DATA

The information produced by a cost accounting system provides a basis for determining product cost and aids management in planning and controlling operations.

#### **Determining Product Costs**

Cost accounting procedures help management in gathering the data needed to determine product costs and thus generate meaningful financial statements and other reports. Cost procedures must be designed to permit the computation of unit costs as well as total product costs. For example, if a manufacturer spent P10, 000 for labor in a certain month, the information is insignificant; but if this labor produced 5,000 finished units, the fact that the cost of labor was P2 per unit is significant, because this figure can be compared to the unit labor cost of other periods and the trends analyzed.

Unit cost information is also useful in making a variety of important marketing decisions.

- 1. Determining the selling price of a product. A knowledge of the cost of manufacturing a unit of product helps in setting the selling price, which should be high enough to cover the cost of production, pay a portion of marketing and administrative expenses and provide a profit. It will be difficult to set the selling price without knowing the costs incurred in the manufacture of a product and cost incurred in rendering a service.
- 2. Meeting competition. If a competitor is selling the product at a low price, detailed information regarding unit costs can be used to determine the action to be taken by the company. The company would know if selling price must be reduced, or manufacturing costs must be reduced, or the product must be eliminated.
- 3. Bidding on contracts. Many manufacturing firms must submit competitive bids in order to be awarded manufacturing contracts by the government or private firms. An analysis of the unit costs relating to the manufacture of a particular product is of great importance in determining the bid price to be submitted. The bid price must be able to cover costs to be incurred and at the same provide profit for the company. It must not be set so high so as to be able to compete with other bidders.
- 4. Analyzing profitability. Unit cost information enables management to determine the amount of profit that each product earns and possibly eliminate those that are least profitable, thereby concentrating efforts on those items that are most profitable.

Costs are said to be used for managerial accounting purposes when costs are used inside the organization by managers to evaluate the performance of operations or personnel, or as a basis for decision making. When costs are used by outsiders, such as stockholders or creditors, to evaluate the performance of top management and make decisions about the organization, we say costs are used for financial accounting purposes.

#### Planning and Control

One of the most important functions of cost accounting is the development of information which can be used by management in planning and controlling

operations. Planning is the process of establishing objectives or goals for the firmi and determining the means by which the firm will attain them. Planning is essential to good management because it provides a means of coordinating all of the operations of firm. Cost accounting helps in the development of plans by providing historical costs that serve as basis for projecting data for planning. Management can analyze trends and relationships among such data as an aid in estimating future costs and operating results and in making decisions regarding the acquisition of additional facilities, changes in marketing strategies, and obtaining additional capital

Planning can be divided into three (3) components:

- 1. Strategic planning concerned with setting long range goals and objectives to determine the overall direction of the company.
- 2. Tactical planning concerned with plans for a shorter range (or tine period) and emphasizes plans to achieve the strategic goals.
- 3. Operations planning relates to the day to day implementation of tactical plans. It emphasizes the coordination of the major factors of production (materials, labor and facilities)

Control is the process of monitoring the company's operations and determining whether the objectives identified in the planning process are being accomplished.

#### RECENT DEVELOPMENTS IN COST ACCOUNTING

Cost accounting is experiencing dramatic changes. Manual bookkeeping has been reduced because of the use of computers. Changes in production methods have made traditional applications of cost accounting obsolete in some cases. Increasing emphasis on cost control is seen now in hospitals, in industries facing stiff foreign competition and in many organizations that have traditionally not focused on cost control.

The traditional role of cost accounting is to record full product cost data for external reporting. However, the use of accounting data for decision making and performance evaluation has gained importance in recent years.

#### COST ACCOUNTING AND OTHER FIELDS OF STUDY

The recording of the costs of a product or a service is part of financial accounting. The use of cost for valuation of inventory and cost of goods sold for external reporting is also financial accounting. The use of cost data in choosing between two or more alternatives is part of managerial accounting. Differential cost analysis is considered by others as a form of applied microeconomics. Cost accounting provides data for use in decision models for finance, operations management, and

marketing. Cost accounting is also related to motivation and behavior because it is used in planning and performance evaluation. Finally, tools from statistics, mathematics, and computer sciences are used to perform cost analysis.

#### TWO BASIC PRODUCT-COSTING SYSTEMS

- 1. Job order costing a system for allocating costs to groups of unique product. It is applicable to the production of customer specified products such as the manufacture of special machines. Each job becomes a cost center for which Costs are accumulated. A subsidiary record (job cost sheet) is needed to keep track of all unfinished jobs (work in process) and finished jobs (finished goods).
- 2. Process costing a system applicable to a continuous process of production of the same or similar goods, e.g., oil refining and chemical production. Since there is no need to determine the costs of different groups of products because the product is uniform, each processing department becomes a cost center.

#### Job Order versus Process Costing

Job order costing and process costing are the two traditional basis approaches to product cost accounting systems. Actual cost accounting systems may differ widely. However, all are based on one of these two product costing concepts. Once the type of system is selected, it is then adjusted to fit a particular industry, company, or operating department. The objective of the two systems is the same. They both provide product unit cost information for pricing, cost control, inventory valuation, and income statement preparation. End-of-period values for the Cost of Goods Sold, Work in Process Inventory, and Finished Goods Inventory accounts are computed using product unit cost data.

#### Characteristics of Job Order Costing

A job order cost accounting system is a product costing system used by companies making one-of-a-kind or special-order products. In such a system, direct materials, direct labor, and factory overhead costs are assigned to specific job orders or batches of production. In computing unit costs, the total manufacturing costs for each job order are divided by the number of good units produced for that order. Industries that use a job order cost accounting system include those that make ships, airplanes, large machines, and special orders. Job order costing may also be used when producing a set quantity of a product for inventory replenishment, such as a

production run of 500 identical lawn mowers. Procedures similar to those used in job-order costing are used in many service industry firms, even if these firms have no work in process or finished goods inventories. In a public accounting firms, for firms, costs are assigned to audit engagements. For consulting and architectural research project.

#### The primary characteristics of a job order cost system are as follows:

- 1) It collects all manufacturing costs and assigns them to specific job or batches of product.
- 2) It measures costs for each completed job, rather than for set time periods.
- 3) It uses just one Work in Process Inventory Control account in the general ledger. This account is supported by a subsidiary ledger of job order cost cards or sheets for each job in process at any point of time.

#### **Characteristics of Process Costing**

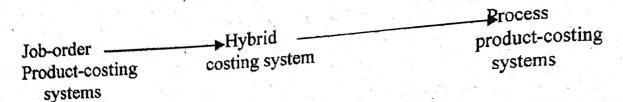
A process cost accounting system is a product costing system used by companies that make a large number of similar products or maintain a continuous production flow. In these cases, it is more economical to account for product-related costs for a period of time (a week or a month) than to try to assign them to specific products or job orders. Unit costs are computed by dividing total manufacturing costs assigned to a particular department or work center during a period by the equivalent unit of production. If a product is routed through four departments, then four unit cost amounts are added to find the product's total unit cost. Companies producing paint, oil and gas. automobiles, bricks, or soft drinks use some form of a process costing system.

#### The main characteristics of a process cost accounting system are as follows:

- 1) Manufacturing costs are grouped by department or work center, with little concern for specific job orders.
- 2) It emphasizes a weekly or monthly time period rather than the time taken to complete a specific order.
- 3) It uses several Works in Process Inventory accounts one for each department or work center in the manufacturing process.

Many manufacturing firms have production systems which are not suited for strictly job-order costing or process costing, but instead require a costing system which

incorporates ideas from both. This blending of ideas is known as hybrid costing. The continuum below demonstrates the relationship between these costing systems.



The costing system an organization selects will mainly depend on its underlying production system. Operation costing is a hybrid costing system often used in repetitive manufacturing where finished products have common, as well as distinguishing characteristics. For example, in the manufacture of clothing, basic suits can be assembled in one operation. These suits can then move on to the next operation and have a deluxe lining added. Based on the variations, the products and the related costs are identified by batches or by production runs. A television assembly plant, which produces a basic chassis and component system, but which varies options such as remote control and cabinetry would be a logical user of operation costing.

Some companies process large orders of identical units as a group through the same production sequence. Each of these orders is called a batch. In batch production, costs are allocated to each batch. Whenever a change in the production line is required to continue production, a new batch is created. A furniture manufacturer may produce a batch of chairs, then a batch of tables, then a batch of drawers, and so forth. Generally, job costing concepts are used to account for batch production and each batch is treated as a job for costing purposes.

#### MAJOR DIFFERENCES BETWEEN PROCESS & JOB ORDER COSTING

#### of the same kind PROCESS COSTING

- 1. Homogeneous units pass through a series of similar processes.
- 2. Costs are accumulated by processing department
- 3. Unit costs are computed by dividing the individual departments' costs by the equivalent production

#### JOB ORDER COSTING

- 1. Unique jobs are worked on during a time period.
- 2. Costs are accumulated by individual iob.
- 3. Unit costs are determined by dividing the total costs on the job cost sheet by the number of units on the job.

- 4. The cost of production report provides 4. the detail for the Work in Process account for ach department
- The job cost sheet provides the Details for the work in Process account.

In job costing, costs are accumulated for each job or batch produced. In process costing, costs are accumulated by department for an accounting period (for example, a month) Process costing has less detailed recordkeeping, hence, if a company was choosing between job and process costing, it would generally find that recordkeeping costs are lower under process costing. Process costing does not provide as much information as job costing because records of the cost of each unit produced are not kept using process costing. The choice of process versus job costing systems involves a comparison of the costs and benefits of each system.

As a general rule job systems are usually more costly than process systems. So if managers and accountants must decide whether to use job costing or process costing, recordkeeping costs must be compared with additional benefits that will be derived from knowing the actual cost of each unit. If recordkeeping costs were equal under job and process systems, for the units in a product line, then the job costing systems are better because they provide all of the data that process systems do.

#### **QUESTIONS**

- 1. Define financial accounting
- 2. Define management accounting.
- 3. How does management accounting serve both external users and internal users?
- 4. What are the differences between financial accounting and managerial accounting?
- 5. Why is managerial accounting information more "future oriented" than financial accounting?
- 6. Discuss the relationships between goals, planning, and controls.
- 7. Identify and define the three levels of planning.
- 8. Differentiate job order costing from process costing.
- 9. What are the main characteristics of job order costing.
- 10. What are the main characteristics of process costing.
- 11. What method must be used by a company manufacturing school bags
- 12. What method must be used by a company manufacturing aircrafts
- 13. What method must be used by a company manufacturing candies
- 14. What method must be used by a beer manufacturing company
- 15. What method must be used by a company tennis balls

#### TRUE-FALSE QUESTIONS

Indicate whether the following statements are true or false by inserting in the blank space provide a capital "T" for true of "F" for false
1. Reports prepared in financial accounting are general-purpose reports, whereas reports prepared in managerial accounting are usually special-purpose reports.
2. Managerial accounting internal reports are prepared more frequently than are classified financial statements.
3, Determining the unit cost of manufacturing a product is an output of financial accounting.
4, Management accounting applies to all forms of business organizations.
5, Controlling is the process of determining whether planned goals are being met.
6. Managerial accounting information generally pertains to an entity as a whole and is highly aggregated.
7. Job order costing system is for allocating costs to group of unique product and is applicable to the production of customer specified products such as the manufacture of special machine.
8. Process costing is used by companies making one-of-a-kind products.
9. Operation costing is a hybrid costing system often used in repetitive manufacturing where finished products have common as well a distinguishing characteristics.

10. Cost accounting procedures help management in gathering the data needed to determine product costs and thus generate meaningful financial statements and other reports.

#### **MULTIPLE-CHOICE**

- 1. Financial statements for external users can be described as
  - a. user-specific.
  - -b. general purpose.
  - c. special purpose
  - d. management reports
- 2. Planning is a function that involves
  - a. hiring the right people for a particular job.
  - b. coordinating the accounting information system
- c. setting goals and objectives for an entity
  - d. analyzing financial statements.
- 3. Which of the following is not a management function?
  - a. Constraining
    - b. Planning
    - c. Controlling
    - d. Directing and motivating
- 4. A manager that is establishing objectives is performing which management function?
  - a. Motivating
  - b. Directing
  - c. Planning
    - d. Constraining
- 5. Management accounting information is generally prepared for

  - b. creditors
  - c. managers
  - d. regulatory agencies

- 6. Managerial accounting is applicable to
  - a. service entities
  - b. manufacturing entities
  - c. merchandising entities
  - d. all of these
- 7. Which of the following is not an internal user?
  - a. creditor
    - b. department manager
    - c. cost accountant
    - d. controller
- 8. Managerial accounting is also called
  - a. management accounting
    - b. controlling
    - c. analytical accounting
    - d. inside reporting
- 9. Management accountants would not
  - a. assist in budget planning
  - b. prepare reports primarily for external users.
    - c. determine coist behavior
    - d. be concerned with the impact of cost and volume on profits
- 10. Internal reports must be communicated
  - a. daily
  - b. monthly
  - c. annually
  - -d. as needed
- 11. Which of the following statements about internal reports is not true?
  - The content of internal reports may extend beyond the doubleentry accounting system.
  - b. Internal reports may show all amounts at market values.
- c. Internal reports may discuss prospective events.
  - d. Most internal reports are summarized rather than detailed

- 12. Internal reports are generally
  - a. aggregated.
  - -b. detailed
    - c. regulated
    - d. unreliable
- 13. Management accounting information
  - a. pertains to the entity as a whole and is highly aggregated.
  - -b. pertains to subunits of the entity and may be very detailed
    - c. is prepared only once a year.
    - d. Is constrained by the requirements of FASB
- 14. Financial accounting information is used for reporting to
  - a. External parties
    - b. Investors
  - c. creditos
    - d. managers
- 15. Which of the following statements about cost accounting is not true?
  - a. Is the intersection between financial and management accounting
  - b. Information generated by cost accounting is used by both financial and managerial accounting.
  - c. Cost accounting provides product cost information to internal parties such as managers for planning and controlling

#### **COSTS - CONCEPTS AND CLASSIFICATIONS**

#### LEARNING OBJECTIVES

Upon completion of this chapter, you should be able to

- Distinguish between cost, expenses, and losses.
- Distinguish between direct and indirect costs.
- Define the three integral components of a product.
- Define prime costs and conversion costs.
- Define variable, fixed, and mixed costs and discuss the effects of changes in volume on these costs.
- Distinguish between common costs and joint costs
- Distinguish between capital expenditures and revenue expenditures
- Identify the costs for planning, control and analytical processes

Costs are associated with all types of organizations – business, non-business, service, retail, and manufacturing. Generally, the kinds of costs that are incurred and the way in which these costs are classified will depend on the type of organization involved.

Our initial focus will be on a manufacturing, but in our discussion we should be aware that, in a conceptual sense, manufacturing encompasses much more than just firms in the industrial sector of our economy. It also encompasses many organizations that are typically viewed as being service in nature, such as movie studios and fast-food outlets. Organizations such as these are involved in manufacturing in the sense that they create a distinct product for customers or patrons. As we proceed with our discussion, therefore, we should keep in mind that manufacturing is a broad term, and that the costs included under the manufacturing heading have application to a wide range of organizations – many of which may be involved in service-type activities. An understanding of the cost structure of a manufacturing company therefore provides a broad, general understanding of costing that can be very helpful in understanding the cost structures of other types of organizations.

Before cost terminology can be discussed the term cost itself must be defined. Cost is the cash or cash equivalent value sacrificed for goods and services that are expected to bring a current or future benefit to the organization. We say cash equivalent because non-cash assets can be exchanged for the desired goods or services. For example, it may be possible to exchange land for some needed equipment.

Costs are incurred to produce future benefits in a profit making firm, future benefits usually mean revenue. As costs are used up in the production of revenues, they are said to expire. Expired costs are called expenses. In each period, expenses are deducted from revenues in the income statement to determine the period's profit. A loss is a cost that expires without producing any revenue benefit. The focus of cost accounting is on costs, not expenses.

CLASSIFICATION OF COSTS

#### I. Costs classified as to relation to a product

- A. Manufacturing costs/product costs
  - 1. Direct materials
  - 2. Direct labor.
  - 3. Factory overhead
- B. Non-manufacturing costs/period costs
  - 1. Marketing or selling expense
  - 2. General or administrative expense

#### II. Costs classified as to variability

- A. Variable costs
- B. Fixed costs
- C. Mixed costs

#### III. Costs classified as to relation to manufacturing departments

- A. Direct departmental charges
- B. Indirect departmental charges

#### IV. Costs classified to their nature as common or joint

- A. Common costs
- B. Joint cost

#### V. Costs classified as to relation to an accounting period

- A. Capital expenditures
- B. Revenue expenditures

#### VI. Costs for planning, control, and analytical processes

- A. Standard costs
- B. Opportunity costs
- C. Differential cost
- D. Relevant cost
- E. Out-of-pocket cost
- F. Sunk cost
- G. Controllable cost

#### MANUFACTURING COSTS/PRODUCT COSTS/INVENTORIABLE COSTS

#### Direct materials

Direct materials are the basic ingredients that are transformed into finished products through the use of labor and factory overhead in the production process. Direct materials are those that can be traced to the finished product can they form part of the product.

All manufactured products are made from basic direct materials. The basic material may be iron ore for steel, sheet steel for automobiles, flour for bread wood tables and chairs,. Theses examples show the link between a basic raw material and a final product.

The way a company buys, stores, and uses materials is important. Timely purchasing is important because if the company runs out of materials, the manufacturing process will be forced to shut down. Shutting down production results in no products, unhappy customers, and loss of sales and profits. Buying too many direct materials, on the other hand, can lead to high storage costs.

Proper storage of materials will avoid waste and spoilage. Large enough storage space and orderly storage procedures are essential. Materials must be handled and stored properly to guarantee their satisfactory use in production. Proper records, the materials stockcars, make it possible to find goods easily. Such records reduce problems caused by lost or misplaced items.

Direct materials are materials that become part of a finished product and can be conveniently and economically traced to specific product units. The costs of these

materials are direct costs. In some cases, however, even though a material becomes part of a finished product, the expense of actually tracing the cost of a specific material is too great. Some examples of this include nails in furniture, bolts in automobiles, and rivets in airplanes. These minor materials and other production supplies that cannot be conveniently or economically traced to specific products are accounted for as indirect materials. Indirect materials costs are part of factory overhead costs.

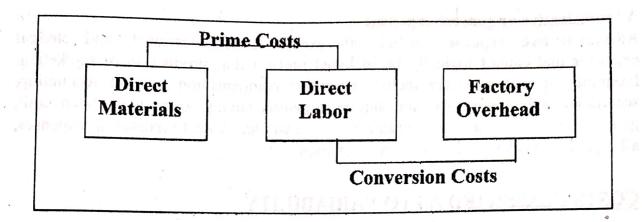
#### Direct labor

Direct labor represent the amount paid as wages to those working directly on the product. Labor services are, in essence, purchased from employees working in the factory. In addition, other types of labor are purchased from people and organizations outside the company. The labor costs usually associated with manufacturing include machine operators; maintenance workers; managers and supervisors; support personnel; and people who handle, inspect, and store materials. Because these people are all connected in some way with the production process, their wages and salaries must be accounted for as production costs and, finally, as costs of products. However, tracing many of these costs directly to individual products is difficult.

To help overcome this problem, the wages of machine operators and other workers involved in actually shaping the product are classified as direct labor costs. Direct labor costs include all labor costs for specific work performed on products that can be conveniently and economically traced to end products. Labor costs for production related activities that cannot be conveniently and economically traced to end products are called indirect labor costs. These costs include the wages and salaries of such workers as machine helpers, supervisors, and other support personnel. Like indirect materials costs, indirect labor costs are accounted for as factory overhead costs. Payroll related costs, such as payroll taxes, group insurance, sick pay, vacation and holiday pay, and other fringe benefits can be considered as part of direct labor costs, but are usually included as factory overhead.

Direct labor plus direct materials = prime costs, while direct labor plus factory overhead = conversion costs. Prime costs and conversion costs may be diagrammed as shown on the next page

Total manufacturing cost = direct materials, + direct labor + factory overhead



#### **Factory Overhead**

The third manufacturing cost element is a catchall for manufacturing costs that cannot be classified as direct materials or direct labor costs. Factory overhead costs are a varied collection of production-related costs that cannot be practically or conveniently traced directly to end products. This collection of costs is also called manufacturing overhead, factory burden, and indirect manufacturing costs.

Examples of the major classifications of factory overhead costs are:

Indirect materials and supplies: nails, rivets, lubricants, and small tools.

Indirect labor costs: lift-truck driver's wages, maintenance and inspection labor, engineering labor, machine helpers, and supervisors.

Other indirect factory costs: building maintenance, machinery and tool maintenance, property taxes, property insurance, pension costs, depreciation on plant and equipment, rent expense, and utility expense.

#### NON-MANUFACTURING COSTS/PERIOD COSTS

#### Marketing or selling expenses

Marketing or selling expenses include all costs necessary to secure customer orders and get the finished product or service into the hands of the customer. Since marketing expenses relate to contacting customers and providing for their needs, these expenses are often referred to as order-getting and order-filling costs. Examples of marketing expenses include advertising, shipping, sales travel; sales commissions, sales salaries, and expenses associated with finished goods warehouses. All organizations have marketing costs, regardless of whether the organizations are manufacturing, merchandising, or service in nature.

Administrative or general expenses

Administrative expenses include all executive, organizational, and clerical expenses that cannot logically be included under either production or marketing. Examples of such expenses include executive compensation, general accounting, secretarial, public relations, and similar expenses having to do with the overall, general administration of the organization as a whole. As with marketing expenses, all organizations have administrative expenses

#### COSTS CLASSIFIED AS TO VARIABILITY

#### Fixed, Variable, and mixed

One of the most important cost classifications involves the way a cost changes in relation to changes in the activity of the organization. Activity refers to a measure of the organization's output of products or services. In specifying cost behavior, the managerial accountant often limits the description to a specific range of activity. This is called the relevant range.

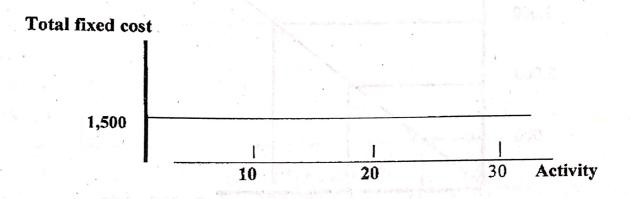
#### Fixed cost

Items of cost which remain constant in total, irrespective of the volume of production. Fixed cost are not related to activity within the relevant range. If activity increases or decreases by 20 percent, total fixed cost remains the same. Cost per unit decreases as volume increases, and increases as volume decreases. Fixed costs are assignable to departments based on difference allocation methods. Examples are salaries of production executives, depreciation of equipment computed on a straight-line basis, periodic rent payments, and insurance.

Fixed costs may classified into two categoriex, depending on the ability of management to influence the levels of these costs in the short-term.

- 1) Committed fixed costs costs that represent relatively long term commitments on the part of management as a result of a past decision. Example depreciation on equipment.
- 2) Managed fixed costs (also known as discretionary, programmed, or planned fixed costs) costs that are incurred on a short-term basis and can be more easily modified in response to changes in management objectives. Examples advertising, research and development and costs of training of employees

Shown on below is a graph of fixed cost. It is clearly shown that total fixed cost remains unchanged as activity changes. When activity triples, from 10 to 30 units, total fixed cost remains constant at P1,500. If activity level is only 1 unit, then the fixed cost per unit is P1,500. If the activity level is 10 units, then the fixed cost per unit declines to P150 per unit. So we can conclude that fixed cost per unit will decrease as we increase the volume or units of production and fixed cost per unit will increase as we decrease the volume of production.



Graph of total fixed cost

Activity - units	Fixed cost per unit Total Fixed Co		
or proh	P 1,500	0 1011A1,500 T	
2	750	1,500	
5	300	1,500	
10	150	1,500	
20	75	1,500	
30	50	1,500	

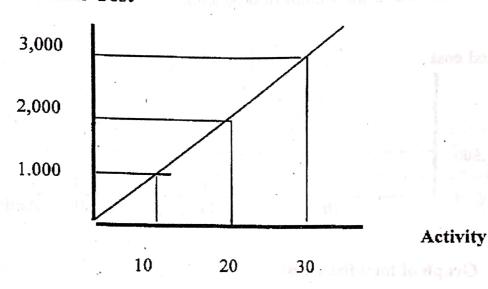
#### Variable costs

These are the items of cost which vary directly, in total, in relation to volume of production. If activity increases by 20 percent, total variable cost increases by 20 percent also. Cost per unit remains constant as volume changes within a relevant range. Examples are: direct materials, direct labor, royalties, and commission of salesmen. Shown on the next page is a graph of total variable cost. As this graph shows total variable cost increases proportionately with activity. When activity doubles from 10 to 20 units, total variable cost doubles, from P1, 000 to P2, 000. However, the variable cost per unit remains the same as activity changes. The

variable cost associated with each unit of activity is P100, whether it is the first unit, the fourth, or the tenth.

To summarize, as activity changes, total variable cost increases or decreases proportionately with the activity change, but unit variable cost remains the same.

#### Total Variable Cost



Graph of total variable cost

#### TABULATION OF VARIABLE COST.

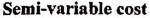
Activity	Variable Cost per Unit	Total Variable Cost	
10,500	P 100	P 100	
10	100	1,000	
20	100	2,000	
30	100	3,000	

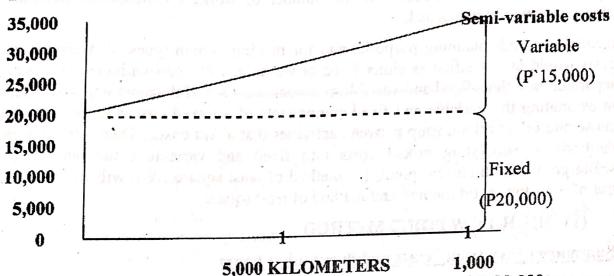
#### Mixed cost

Items of cost with fixed and variable components. Mixed costs vary with the level of production, though not in direct relation to it, probably because part of the cost is fixed while the rest is variable. Two types of mixed costs exist — semivariable costs and step costs

Semivariable cost. The fixed portion of a semi-variable cost usually represents a minimum fee for making a particular item or service available. The variable portion is the cost charged for actually using the service. The cost of electricity where there is a basic minimum charge plus a specified cost per kilowatt hour above the

minimum is an example of such a semi-variable cost. The cost charged for using a cell phone under a plan is also an example of a semi-variable cost.. The cost of the plan is fixed and it is for a specified time used, however if the user exceeds the time allowed, then charges will be made on a per minute basis.

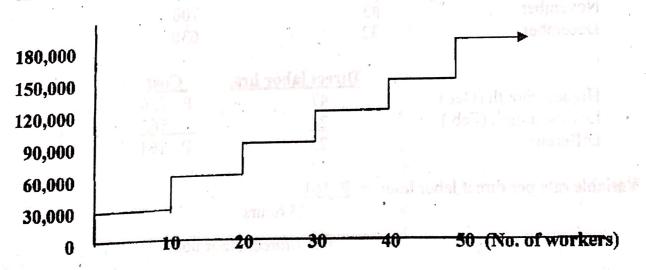




Assume that a company rents a delivery truck at a flat rate of P 20,000 per month plus P 1.50/km.driven. The fixed portion is the P20,000 monthly rental fee; the variable portion is the P1.50/km driven. If 10,000 km. are driven during the month, the total monthly cost of the delivery truck is P 35,000, computed as follows:

Flat fee (fixed portion)	P 20,000
Variable portion – 10,000 km. x P 1.50	15,000
	P 35,000
Total cost	

Step costs - the fixed part of step costs changes abruptly at various activity levels because these costs are acquired in indivisible portions. A step cost is similar to a fixed cost within a very small relevant range.



\* 4lang gard

nu tena baxit

The supervisor's salary is an example of step cost. Assume that one supervisor with a salary of P 30,000 is needed for every 10 workers, then if 15 workers are used, 2 supervisors (with salaries of P60,000) will be needed. If 18 workers are used, still 2 supervisors would be needed. If the number of workers increases to 22, three supervisors would be needed.

Ideally, for both planning purposes and for making certain types of decisions, all costs would be classified as either fixed or variable, with semi-variable costs being separated into their fixed and variable components. One of the most important steps in estimating the variable and fixed components of a mixed cost is to examine the cause and effect relationship between activities that affect costs,. There are different methods of separating mixed costs into fixed and variable components: scattergraph, (2) high-low point, (3) method of least square. We will illustrate the use of high-low point method and method of least square

#### (1) HIGH-LOW POINT METHOD

#### Summary of electricity costs and direct labor hours

T. C.		
Month	Direct labor hrs.	Cost of electricity
January distribution	28	P 625
February had been seen as	1 . The G 24 07 11 House	burido 565 de ar not
March	a Mikita 301 al Abasa y	
April	33. *	640
May	. 38	685
June	34	640
July	35	655
August - August	40	700 ch sh
September	42 develor	t bransport 715 strop of
October	47 .581167 1987	rator Pena <b>726</b> y a mini
November	43	700
December	32	630
	Direct labo	r hrs. Cost
Highest month (Oct.)	47	P 726
Lowest month (Feb.)	24	565
Difference	23	P 161

**Variable** rate per direct labor hour = P = 161

(explorer to my) ve

23 hours

= P 7/direct labor hour

P 161

Fixed cost can be computed from either the high or low data.

and of compared from ordior th	High		Low	
Total cost of electricity Less: variable proportion	P	726	*	P 565
(P 7 x 47)		329		
(P 7x 24) Monthly fixed cost	<u>p</u>	397		<u>168</u> <u>P 397</u>

The formula for projecting the total monthly cost of electricity based on these data would be P 397 plus P7 multiplied by the direct-labor hours expected to be worked during the period (Y = FC + VC or Y = FC + VX) where

Y = Total cost V = Variable cost per unit X = Activity level

VC = Total variable cost FC = Fixed cost

#### (2) METHOD OF LEAST SQUARE

The three formulas to be used in least-square method are:

Equation 1 Y = a + bxEquation 2  $\Sigma Y = na + b\Sigma x$ Equation 3  $\Sigma XY = \Sigma xa + b\Sigma x^2$ 

Using the same data as in the high-low method the following have been computed

COIII	Juliou			
	DLHrs.	Electricity Co		<b>**</b> ?
	X	Y Y	XY	X <sup>2</sup>
	28	625	17,500	784
	rel r <b>24</b> orliens br	565	id onian b13,560 atmonts	576
10,3	30	630	18,900	900
	33	640	21 120	1,089
	38	685	26,030	1,444
	34	640	21,760	1,156
		655	. 22,925	1,225
	35	700	28,000	1,600
45.44	40	610m 7150 W	ii bevolari30,030 7197 40	1,764
100	190 42 1150 30	726	34,122	2,209
730/0	a. 1147 largo paeril		30,100	1,849
will .	ghita 431 unites oid	9 HALL (700 C) 616		
	no. 132 of feedback	<u>630</u>	100 man 20,160 gm Mad	1,024
$\Sigma =$	426	7,911	284,207	15,620

By substitution:

Equation 2 
$$\Sigma y = na + b\Sigma x$$
  
 $(7,911 = 12a + b426) 35.5 (426/12)$   
Equation 3  $\Sigma xy = \Sigma xa + b\Sigma x^2$   
 $284,207 = 426a + b15,620$   
Equation 2x35.5  $280,840.5 = 426a + b15,123$   
 $3,366.5 = 0 b 497$   
 $b = 3,366.5/497$ 

Substituting the value for Equation 2, we can compute for a as follows

$$7,911 = 12a + (6.77)(426)$$
  
 $7,911 = 12a + 2,884$   
 $12a = 7,911-2,884$   
 $a = 5,027/12$   
 $= 418.92$ 

Formula using high-low method

$$Y = a + bx$$
$$= 397 + 7x$$

Formula using least square method

$$Y = a + bx$$
  
= 419 + 6.77x

In most cases the amounts derived using high/low point and method of least square are not the same.

#### Common cost vs. Joint cost

#### Common cost

Costs of facilities or services employed in two or more accounting periods, operations, commodities, or services. Just like indirect costs, these costs are subject to allocation. Example – if two departments are occupying the same building, the depreciation of the building id a common cost subject to allocation based on floor area occupied.

### Joint cost

Costs of materials, labor, and overhead incurred in the manufacture of two or more products at the same time. A major difficulty inherent to joint costs is that they are indivisible and they are not specifically identifiable with any of the products being simultaneously produced. These costs are also subject to allocation. Example – direct materials, direct labor, and factory overhead cost incurred to manufacture two or more products up to the point of split-off (or where they will go separate ways)

### Capital expenditure vs. Revenue expenditure

Capital expenditure

Expenditure intended to benefit more than one accounting periods and is recorded as an asset. The allocation of the cost to the different periods is – depreciation for fixed tangible assets, amortization for intangible assets and depletion for wasting assets.

Révenue expenditure

Expenditure that will benefit current period only and is recorded as an expense.

### Direct vs. Indirect departmental charges

Direct departmental charges

Costs that are immediately charged to the particular manufacturing department(s) that incurred the costs since the costs can be conveniently identified or associated with the department(s) that benefited from said costs.

Indirect departmental charges

Costs that are originally charged to some other manufacturing department(s) or account(s) but are later allocated or transferred to another department(s) that indirectly benefited from said costs.

# Costs for Planning, control and analytical processes

Standard costs

Predetermined costs for direct materials, direct labor, and factory overhead. They are established by using information accumulated from past experience and data secured from research studies. In essence, a standard cost is a budget for the production of one unit of product or service. It is the cost chosen by the managerial accountant to serve as the benchmark in the budgetary control system.

### Opportunity cost

The benefit given up when one alternative is chosen over another. Opportunity costs are not usually recorded in the accounting system. However, opportunity costs should be considered when evaluating alternatives for decision-making. If an asset can be used to perform only one function and cannot be sold or used in other ways, the opportunity cost of that asset is zero.

### Example 1

Michelle has a part-time job that pays her P1, 000 per week. She would like to spend a week in Boracay during summer vacation from school, but she has no vacation time available. If she takes the trip anyway, the P1, 000 in lcst wages will be an opportunity cost of doing so.

### Example 2

Marco is employed with a company that pays him a salary of P20, 000 a month. He is thinking about leaving the company and returning to school. Since returning to school would require that he give up his P240, 000 salaries, the forgone salary would be an opportunity cost of seeking further education.

### Differential cost

Cost that is present under one alternative but is absent in whole or in part under another alternative. An increase in cost from one alternative to another is known as *incremental cost*, while a decrease in cost is known as *decremental cost*. Differential cost is a broader term, encompassing both cost increases (incremental cost) and cost decreases (decremental costs) between alternatives.

The accountant's differential cost concept is basically the same as the economist's marginal cost concept. In speaking of changes in cost and revenue, the economist employs the terms marginal cost and marginal revenue. The revenue that can be obtained from selling one more unit of product is called *marginal revenue*, and the cost involved in producing one more unit of product is called *marginal cost*.

Differential costs can be either fixed or variable. To illustrate, assume that Avon Corp. is thinking about changing its marketing method from distribution through retailers to distribution by direct sale. Present costs and revenues are compared to projected costs and revenues in the table on the next page.

the state of the s	Retailer	Direct sale	Differential
	Distribution	Distribution	Cost and
	(present)	(proposed)	Revenues
Revenues (V)	P 900,000	P 1,200,000	P 300,000
Cost of goods sold (V)	450,000	600,000	150,000
Advertising (F)	80,000	45,000	( 35,000)
Commission (V)	trop of the total	40,000	40,000
Warehouse depreciation (F)	50,000	80,000	30,000
Other expenses (F)	60,000	60,000	
Total	640,000	825,000	185,000
Net Income	P 260,000	P 375,000	P 115,000

V = Variable F = Fixed

The differential revenue is P 300,000, and the differential costs total P 185,000, leaving a positive differential net income of P 115,000 under the proposed marketing plan. As noted earlier, those differential costs representing cost increases could have been referred to more specifically as incremental costs, and those representing cost decreases could have been referred to more specifically as decremental costs.

### Relevant cost

A future cost that changes across the alternatives. In the example above, the relevant costs are cost of goods sold, advertising, commissions, and warehouse depreciation.

Out-of-pocket cost

Cost that requires the payment of money (or other assets) as a result of their incurrence.

### Sunk cost

**Expense Category** 

Operating expenses

future decision, they are not differential costs, and therefore they should be used in analyzing future courses of action.

To illustrate the notion of a sunk cost, assume that a firm has just paid P 250,000 for a special purpose machine. Since the cost outlay has been made, the P250,000 investment in the machine is a sunk cost. Even though the purchase may have been unwise, no amount of regret can relieve the company of its decision, nor can any future decision cause the cost to be avoided.

# Controllable and Non-controllable Costs

A cost is considered to be a controllable cost at a particular level of management if that level has power to authorize the cost. For example, entertainment expense would be controllable by a sales manager if he or she had power to authorize the amount and type of entertainment for customers. On the other hand, depreciation of warehouse facilities would not be controllable by the sales manager, since he or she would have no power to authorize warehouse construction.

In some situations, there is a time dimension to controllability. Costs that are controllable over the long run may not be controllable over the short run. A good example is advertising. Once an advertising program has been set and a contract signed, management has no power to change the amount of spending. But the contract expires, advertising costs can be renegotiated, and thus management can exercise control over the long run.

# COST FLOW - MANUFACTURING FIRMS Cost incurrence

Selling and Administrative

# 

Work in process consists of goods that are started but not completed. Finished goods are goods that are complete and ready for sale.

# **COST FLOW - MERCHANDISING FIRM**

Cost incurrence	Expense category
Finished goods	Cost of goods sold
Selling and Administrative	
COST FLOW - SERVICE FIRM	o substant of the following the companies of the companie
Cost incurrence	Expense category
Direct materials	
Direct labor	Cost of services
Factory overhead }	erin mekan salah di salah sidain salah sal
Selling and Administrative	Operating expense

The essential purpose of any organization is to transform inputs into outputs. The activity for merchandising, manufacturing, and service organizations are shown in the previous and current page. These organizations have many similarities, all require labor and capital as inputs, and all transform them into a product or service for the market. These organizations also differ from one another in many respects. The differences between these organizations are reflected in their accounting systems.

A merchandising organization starts with a finished product and markets it. Because inventory is acquired in finished form, its cost is easily ascertained.

The accounting system for a manufacturing organization is more complex because direct materials are first acquired and then converted to finished products. A manufacturer's accounting system focuses on work in process, which is the account that reflects the costs involved in transforming input materials into finished goods.

Service organizations are different from manufacturing and merchandising because they have no inventory of goods for sale. Costs are charged to responsibility centers for performance evaluation. In a public accounting firm, for example, costs are charged to the audit department, the tax department, and so forth. Costs are also charged to jobs. The assignment of costs facilitates performance evaluation. The manager of each department is held responsible for the costs of the department, the manager of each job is held responsible for the cost of that job. Of the three kinds of operations, manufacturers require the most complex and comprehensive cost accounting system. All three uses cost information for decision making and performance evaluation. But in addition, manufacturers need product costing for inventory valuation and to measure cost of goods sold reported on external financial statements. Many manufacturers also have service and merchandising activities, costs of which must be recorded.

# SUMMARY OF IMPORTANT FORMULAS

- 1. Total variable costs = Variable cost per unit x total output
- 2. Total cost = Total variable cost total fixed coxt
- 3. Variable rate = highest point cost lowest point cost
  Highest output lowest output
- 4. Fixed cost = Total cost at highest (variable rate x output at highest point) or

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5. Fixed cost = Total cost at lowest - (variable rate x output at lowest point)

### **QUESTIONS**

- 1. In what way does a typical manufacturing business differ from a merchandising concern? In what ways are they similar?
- 2. What are the basic elements of production cost?
- 3. Define the following costs
  - a. direct materials
  - b. indirect materials
  - c. direct labor
  - d. indirect labor
  - e. factory overhead
- 4. Define prime cost and conversion cost.
- 5. Does prime cost plus conversion cost equal to the total manufacturing cost?
- 6. In what way does the accounting treatment of factory overhead differ from that of direct materials and direct labor costs?
- 7. Explain why the fixed cost per unit declines as volume increases. Give an example
- 8. Give examples of variable overhead costs and fixed overhead costs.
- 9. How would you classify the monthly bill (plan) for a Smart/Globe cellphone?
- 10. Consider education as a product. What are the direct costs and the indirect costs to a university in educating a student?

Presented below is a list of costs and expenses usually incurred by Ram Corporation, a manufacturer of furniture, in its factory.

- 1. Metal used in manufacturing tables
- 2. Insurance on factory machines
- 3. Leather used in manufacturing furniture
- 4. Wages paid to machine operators
- 5. Depreciation of factory machinery
- 6. Salaries of factory supervisors
- 7. Wood used in manufacturing furniture
- 8. Sandpaper, bolts and nails
- 9. Property taxes on factory building
- 10. Rent of factory building

### Instructions

Classify the above items into the following categories (a) direct materials, (b) direct labor and (c) manufacturing overhead.

### Problem 2

Classify the following as to fixed, variable or mixed

- 1. Factory rent
- 2. Wages for workers paid based on units produced
- 3. Equipment maintenance
- 4. Cost accountant's salary
- 5. Depreciation based on output
- 6. Salary of factory supervisor
- 7. Telephone (monthly)
- 8. Paper in the manufacture of books
- 9. Wages of machine operators
- 10. Commission of salesmen

### Problem 3

Classify the following as either manufacturing (M), selling (S), or administrative (A)

- 1. Metal for the manufacture of golf clubs
- 2. Wages of drivers of delivery trucks
- 3. Rent on factory building
- 4. Freight-in of materials purchased
- 5. President's salary

Classify each of the following costs of Bug Company in two ways: (a) as variable (V) fixed costs (F); (b) as inventoriable costs (I) or period costs (P):

	(a) V or F	(b) I or P
Example: Direct labor	<u>V</u>	<u> </u>
1. Wood used in bookcases	Frank L	HOME A
<ul><li>2. Machine depreciation based on mach. Hrs.</li><li>3. Fire insurance on factory equipment</li></ul>	as <del>da r</del> )	Mariley,
4. Wiring used in radios		1 C-10 102 0 0
5. Indirect materials		
6. Sales commissions	231 O K	THE TOTAL
7. Bottles used to package liquid	13	it was a
8. Gasoline for a delivery truck		
9. Straight-line depreciation of trucks used	:-Wis document	oni leliar
for delivery of sales to customers	1	in the self of
10. Machine operator's hourly wages		*

### Problem 5

Kyrie Company produces different sizes of basketballs. The following costs were incurred during the year.

Materials	P65,000 (P 15,000 is indirect)
Labor	70,000 (P 18,000 is indirect)
Factory overhead	95,000 (including indirect materials
no was in the state of the	and indirect labor)
General and administrative expenses	2,600
Office salaries	18,600

There were no work in process at the end of the year, 5,000 units were produced, and 90% of the units produced were sold

### Required:

- 1. Compute the prime costs
- 2. Compute the conversion costs
- 3. Compute the total product costs
- 4. Compute the total period costs
- 5. If the selling price is P50.00, how much is the net income

The financial statements of Mother Goose Company included these items:

Marketing costs	P	160,000
Direct labor cost		245,000
Administrative costs		145,000
Direct materials used		285,000
	gred on the Star b	175,000
Variable factory overhead costs		155,000

# Compute for the following

- 1. Prime cost
- 2. Conversion cost
- 3. Total inventoriable/product cost
- 4. Total period cost

### Problem 7

Sales price	P 200 per unit
Fixed costs:	
Marketing and administrative  Manufacturing overhead  Variable costs:	24,000 per period 30,000 per period
Marketing and administrative Manufacturing overhead Direct labor	6 per unit 9 per unit
Direct naterials Units produced and sold	30 per unit 60 per unit 1,200 per period

### Required: Compute for the following

- 1. Variable manufacturing cost per unit
- 2. Variable cost per unit
- 3. Full manufacturing cost per unit
- 4. Full cost to make and sell per unit

Problem 8
Given the following facts, complete the requirements below:

Westinghouse Company manufactures major appliances. Because of growing interest in its product, it has just had its most successful year. In preparing the budget for next year, its controller compiled these data.

MONTH	VOLUME IN MACH. HRS. ELECTRICITY COST		
JULY	6,000	P 60,000	
AUGUST	5,000	53,000	
SEPTEMBER	4,500	49,500	
OCTOBER	4,000	46,000	
NOVEMBER	3.500	42,500	
DECEMBER	3,000	39,000	
6-MONTH TOTAL	26.000	P290,000	

Using the high-low method compute

- 1 The variable cost per machine hour
- 2 The monthly fixed electricity costs
- 3 The total electricity costs if 4,800 machine hours are projected to be used next month

### Problem 9

Johnson Corporation is preparing a flexible budget and desires to separate its electricity expense, which is semi-variable and fluctuates with total machine hours, into its fixed and variable components. Information for the first three months of 2009 is as follows:

	Machine Hours	Electricity Expense
January	3,500	P 31,500
February	2,000	20,000
March	4,000	35,600

### Requirements:

- 1. Compute the variable rate per machine hour.
- 2. Compute the fixed portion of Johnson's electricity expense.
- 3. Compute the total manufacturing costs if Johnson's actual machine hours used is 4,500.

Valdez Motors Co. makes motorcycles. Management wants to estimate overhead costs to plan its operations. A recent trade publication revealed that overhead costs tend to vary with machine hours. To check this, they collected the following data for the past 12 months.

Month No.	Machine Hours	Overhead Costs
1	175	P 4,500
2	170	4,225
3	160	4,321
. 4	190	5,250
5	175	4,800
6	200	5,100
7	160	4,450
8	150	4,200
9	210	5,475
10	180	4,760
11	170	4,325
12	145	3,975

### Requirements

- 1. Use the high-low method to estimate the fixed and variable portion of overhead costs based on machine hours.
- 2. If the plant is planning to operate at a level of 200 machine hours next period, what would be the estimated overhead costs?
- 3. Use the method of least square to estimate the fixed and variable portion of overhead costs based on machine hours.

committee by the stemps were

TRUE-FALSE QUESTIONS
Indicate whether the following statements are true or false by inserting in the blank
space provided a capital "T" for true or "F" for false.
1. The materials, labor, and overhead costs incurred to produce a
product are called period costs.
2. Marketing, Selling, and Administrative Costs are the three broad
classifications of costs incurred by a manufacturing company.
3. Lumber can be both a finished product and a material.
4. Product cost consists of the sum of prime cost and conversion cost.
5. Total fixed costs decrease with increase in the number of units produced
6. Period costs are found in both merchandising and manufacturing firms.
7. The three cost elements of a manufactured good are direct materials, direct
labor, and marketing costs.
8. A cost that is present under one alternative but absent in whole or part
under another alternative is known as a differential cost.
9. Like product costs, period costs are not necessarily treated as expenses in
the period in which they are incurred.
10. Variable costs are costs that change, in total, in direct proportion to changes
in the level of activity.
11. The salary paid to the manager in charge of a warehouse is probably a
variable cost.
12. Indirect materials/factory supplies are classified as administrative expense.
13. The salary paid to a factory foreman is classified as factory overhead.
14. In a manufacturing setting, prime costs are fixed.
15. Fixed cost remains constant if expressed on a unit basis.
16.Differential costs can be either fixed or variable
17. A fixed cost is constant per unit of product.
18. A decrease in production will ordinarily result in an increase in fixed
production cost per unit.
19. A factory supervisor's salary would be classified as a direct cost of a unit of
product.
20. Factory rent is included in manufacturing overhead, but office rent is a
period cost.
21. Product costs are also known as manufacturing costs.
22 Prime costs are always variable
23. Cost accounting is not needed by a merchandising entity
24 The statement of financial position of a service business is the same as that
of a manufacturing business
25. Selling and administrative expenses are sometimes called non-
manufacturing costs

### MULTIPLE CHOICE

1. Indirect material cost is a

Conversion cost		Prime cost	
a.	No	No	
b.	No di	Yes	
c.	Yes	Yes	
d.	Yes	No	

2. Direct labor cost is a

<u>Co</u>	nversion cost	Prime cos
a.	No	No
b.	No at the same a greater	Yes
c.	Yes	Yes
d.	Yes was the second	No

- 3. Indirect labor is a
- a. Prime cost.
  - b. Conversion cost.
  - c. Period cost.
    - d. Non-manufacturing cost.
  - 4. In a job cost system, manufacturing overhead is

    An indirect cost of jobs A necessary element of production

a.	No	There of the state of the	Yes
b	No	So wan a con for his or masser on	No
c.	Yes	The state of the state of	Yes
d.	Yes	school yhtiotistonem at	No

- 5. Prime cost and conversion cost share what common element of total cost?
  - a. Variable overhead.
- b. Fixed overhead.
  - c. Direct materials.
  - d. Direct labor.

6. Which of the following is an element of prime cost?

Direct materials		Direct labor
a.	Yes	Yes
b.	Yes	No
c.	No	Yes
d.	No	No

7. Wages paid to factory machine operators of a manufacturing plant are an element of

Prime cost		Conversion cost	
a.	No	No	
b.	No	Yes	
c.	Yes	No	
d.	Yes	Yes	

- 8. Costs that vary inversely with changes in volume include
  - a. Total variable costs.
  - b. Total variable costs divided by volume.
  - c. Total fixed costs.
  - d. Total fixed costs divided by volume.
- 9. When a unit of product is the cost object, factory overhead generally is:
  - a. A direct manufacturing cost.
  - b. An indirect manufacturing cost.
  - c. Both of the above.
  - d. None of the above.
- 10. Factory rent is
  - a. A prime cost and an inventoriable cost.
  - b. A prime cost and a period cost
  - c. A conversion cost and an inventoriable cost.
  - d. A conversion cost and a period cost.

- 11. Examples of factory overhead costs are
  - a. Lubricants for factory machinery.
  - b. Depreciation of factory machinery.
  - c. Both of the above.
  - d. None of the above.
- 12. In general, the cost that could usually be most reliably predicted is:
  - a. Variable cost per unit.
    - b. Fixed cost per unit
    - c. Total variable cost.
    - d. Total fixed cost.
- 13. Factory supplies used would be an example of which of the following?

	Prime cost	Conversion cost
a.	Yes	Yes
b.	Yes	the eye No come make the
c.	No	Yes
d.	No	No

- 14. For a manufacturing company, which of the following is an example of a period rather than a product cost?
  - a. Depreciation of factory equipment.
  - b. Wages of a salesperson.
  - C. Wages of machine operators.
  - d. Insurance on factory equipment.
- 15. The variable portion of the semi-variable cost of electricity for a manufacturing plant is a:

	Conversion cost	Period cost
a.	Yes	No
b.	Yes	Yes
c.	No	Yes
d.	No	No

- 16. Indirect costs are also known as:
  - a. Differential costs
  - b. Common costs
  - c. Opportunity costs
  - d. Sunk costs

### 17. Variable cost

- a. increases on a per unit basis as the number of units produced increases.
- b. is constant if expressed on a per unit basis.
- c. remains the same in total as production increases.
- d. is not affected by changes in activity from period to period.
- . 18. All of the following are examples of product costs except:
  - a. depreciation on the company's retail outlets.
  - b. salary of the plant manager.
  - c. insurance on the factory equipment
  - d. rental costs of the factory facility.
- 19. The distinction between indirect and direct costs depends on
  - a. whether a cost is controllable or noncontrollable.
  - b. whether a cost is variable or fixed.
  - C. whether a cost is a product or a period cost.
  - d. whether a cost can be conveniently and physically traced to a unit under consideration.
- 20. Which of the following should <u>not</u> be included as manufacturing overhead in the manufacture of a wooden chair?
  - a. Glue in the chair
  - b. The amount paid to the individual who stains the chair
  - C. The workman's compensation insurance of the supervisor who oversees production
  - d. The factory utilities of the department in which production takes place

### **MULTIPLE CHOICE - PROBLEMS**

The following costs relate to Antonio Industries for the last quarter:

Conversion cost

Direct materials

Manufacturing overhead

Selling and administrative expense

P 435,000

215,000

185,000

- 1. What is Antonio's prime cost for last quarter?
  - a. P 460,000
  - **b.** P 410,000
  - c. P 405,000
  - d. P 375,000
- 2. Antonio's total manufacturing cost is
  - a. P 460,000
  - **b.** P 645,000
  - c. P 650,000
  - **d.** P 840,000
- 3. Antonio's total period cost is
  - a. P 185,000
  - b. P 275,000
  - c. P 400,000
  - **d.** P 620,000

Milktopia, Inc. produces and sells milk flavored bubble gum. Over the last five months Milktopia had the following production costs and production volume..

Month	Cost	Volume (in cases)
March	P 6,000	12
April	6,659	14
May	8,370	18
June .	8,800	19
July	8,050	17

4.. Using the high-low method, what is the fixed cost per month for bubble gum production?

Pι	ouu	CHOIL		
-		400		c. P 4,800
		1.200	region will be continued in	d. P 7,600

5.. The variable cost per case is

a.	P	400	c.	P 1,200
b.	P	600	d.	P 2,800

### Chapter 2 Cost - Concepts and Classification

Justine Co. produced 5,500 outdoor chairs for Job Order No. 610. Total material cost was P 51,700. Each chair required 2.2 hours of direct labor at P8.90/ hour. A total of P53,845 of factory overhead was traced to Order 610.

6. What is the prime cost per unit of this order?

P 19.58 **b.** P 28.98

c. P 29.37

d. P 38.77

7. What is the conversion cost per unit of this order?

P 19.58

c. P 29.37

P 28.98 b.

d. P 38.77

8. What is the unit cost of this order?

**a.** P 37.88

c. P 28.09

**b.** P 38.77

d. P 36.99

During the month of August, Amer Corporation produced 12,000 units and sold them for P20 per unit. Total fixed cost for the period were P 154,000, and the operating profit was P 26,000.

9. Based on the foregoing information, the variable cost per unit is

a. P 4.50

c. P 6.00

b. P 5.00

d. P 7.17

Data to be used in applying the high-low method shows the highest cost of P69,000 and the lowest cost of P52,000. The data show P148,000 as the highest level of sales and P97,000 as the lowest level.

10. What is the variable cost per peso sales?

a. P 0.33

c. P 0.54

b. P 0.47

d. P 3.00

Ravena Company manufactures office furniture. During the most productive month of the year, 3,500 desks were manufactured at a total cost of P84,400. In its slowest month, the company made 1,100 desks at a cost of P46,000.

11. Using the high-low method of cost estimation, the total fixed cost are

a. P56,000

c. P17,600

b. P28,400

d. P38,400

12. The variable cost per unit is

a. P 16.00

c. P 14.00

b. P 15.00

d. P 17.00

Last year. Abner Company incurred the for Direct materials Direct labor Factory overhead Selling expense Administrative expense Units produced and sold 10,000 units at a	20,000 130,000 40,000 36,000
13. Prime cost per unit is a. P 7.00 b.P15.00	c. P 5.00 d. P20.00
<ul><li>14. Conversion cost per unit is</li><li>a. P 7.00</li><li>b. P 15.00</li></ul>	c P20.00. d. P26.00
<ul><li>15. Cost of goods sold per unit is</li><li>a. P 7.00</li><li>b. P 15:00</li></ul>	c. P 20.00 d. P26.00
<ul><li>16. Gross profit per unit is</li><li>a. P 11.00</li><li>b. P 15.00</li></ul>	c. P 16.00 d. P 24.00
17. Operating income is a. P 24,000 b. P 110,000	c. P 74,000 d. P110,000
Direct materials  Direct labor	of a product which was sold at a price of ative incurred P30,000 P 25.00 16.00 19.00
18. Conversion cost per unit is	d P45 00
<ul><li>19. Cost of goods sold per unit is</li><li>a. P 41.00</li><li>b. P 44.00</li></ul>	c. P35.00 d. P60.00
20. Gross profit per unit is a. P54.00 b. P51.00	c. P60.00 d. P35.00

### CHAPTER

3

### COST ACCOUNTING CYCLE

### LEARNINGS OBJECTIVES

Upon completion of this chapter, you should be able to

- Understand the cost accounting cycle and a man
- Differentiate service, merchandising, and a-manufacturing entities
- Distinguish between and account for direct and indirect materials and labor as they are used in the production process
- Prepare the different financial statements for a service entity, merchandising entity and manufacturing entity

The objective of accounting, in general, is the accumulation of financial information that is useful in making economic decisions. Financial accounting focuses on the gathering of information to be used in the preparation of financial statements that meet the needs of investors, creditors, and other external users of financial information. The statements include a balance sheet, income statement, and statement of cash flows. Although these financial statements are useful to management as well as external users, additional reports, schedules, and analyses are required for internal use in planning and control. Cost accounting provides the additional information required by management, and also provides data necessary for the preparation of external financial statement. For example, cost accounting procedures are necessary for the determination of cost of goods sold on the income statement and the valuation of inventories on the balance sheet.

Manufacturing Inventory Accounts

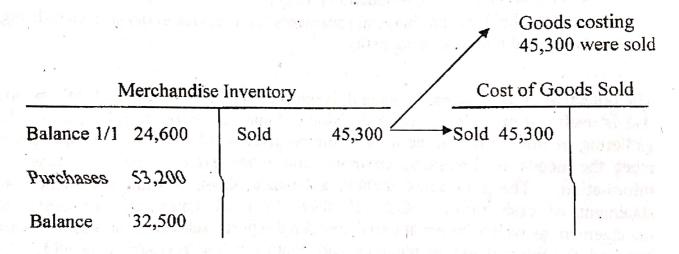
Most manufacturing companies use the perpetual inventory approach. In the remaining sections of this book, you are to assume that a company uses the perpetual inventory system unless otherwise indicated. Accounting for inventories is the more difficult part of manufacturing accounting when compared with merchandising accounting. Instead of dealing with one account – Merchandise Inventory – three accounts must be used: Materials Inventory, Work in Process Inventory, and Finished Goods Inventory.

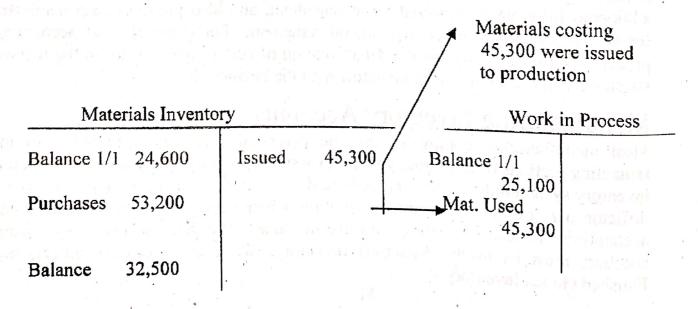
51

**Materials Inventory** 

The Materials Inventory account, also Materials Inventory Control account, is made up of the balances of materials and supplies on hand. This account is maintained in much the same way as the Merchandise Inventory account. The main difference is the way that the costs of items in inventory are assigned. For the merchandising company, goods taken out of inventory are items that have been sold. When a sale is made, an entry is needed to debit Cost of Goods Sold and to credit Merchandise Inventory for the cost of the item. Materials, on the other hand, are usually not purchased for resale but for use in manufacturing a product. Therefore, an item taken out of Materials Inventory and requisitioned into production is transferred to the Work in Process Inventory account (not Cost of Goods Sold).

Figure 3-1 Merchandise Inventory versus Materials Inventory





# Work in Process Inventory

All manufacturing costs incurred and assigned to products being produced are classified as Work in Process Inventory costs. This inventory account has no counterpart in merchandise accounting. A thorough understanding of the concept of Work in Process Inventory is vital in manufacturing accounting. Figure 3-2 shows the various costs that become part of Work in Process Inventory and the way costs are transferred out of the account.

The issuance of materials production, shown in Figure 3-1, begins the production process. These materials must be cut, molded, assembled, or in some other way changed into a finished product. To make this change, people, machines, and other factory resources (buildings, electricity, supplies, and so on) must be used. All of these costs are manufacturing cost elements (product costs), and all of them enter into accounting for Work in Process Inventory

Direct labor earned by factory employees are also product costs. Since these people work on specific products, their labor costs are assigned to those products by including the labor peso earned as part of the Work in Process Inventory account.

Overhead costs are product costs and must be assigned to specific products. Thus, they, too, are included in the Work in Process Inventory account. As discussed earlier, there are many overhead costs to account for on an individual basis. To reduce the amount of work needed to assign these costs to products, they are accumulated and accounted for under one account title: Factory Overhead Control. These costs are then assigned to products by using an overhead rate. Using this rate, called a predetermined overhead rate, costs are charged to Work in Process Inventory account. In the example in Figure 3-2, factory overhead costs of P 65,000 were charged to the Work in Process Inventory account. The predetermined overhead rate will be discussed in Chapter 8.

As products are completed, they are put into the finished goods storage area. These products now have materials, direct labor, and factory overhead costs assigned to them. When products are completed, their costs no longer belong to work in process. Therefore, when the completed products are sent to the storage area, their costs are transferred from the Work in Process Inventory account to the Finished Goods Inventory. The balance remaining in the Work in Process Inventory account (P 13,500 in Figure 3-2) represents the costs that were assigned to products partly completed and still in process at the end of the period.

Figure 3-2. The Work in Process Inventory Account

The Work in Process the covery A

Products costing P201,600 were completed and transferred to finished goods inventory

Work in	<b>Process</b>	Inventory	Account
---------	----------------	-----------	---------

Finished Goods Inventory

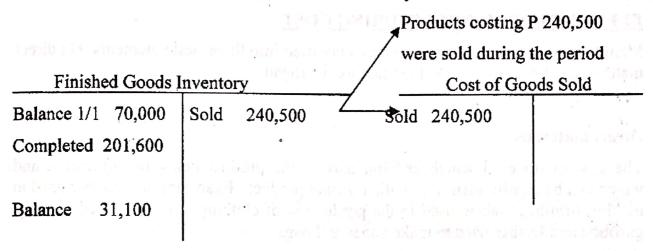
Balance 1/1 Materials Materials Labor Lauge Overhead	25,100 45,300 79.700 65,000	Completed during the period 201,600 Completed 201,600
Balance	13,500	The second of the second secon

### **Finished Goods Inventory**

The Finished Goods Inventory account, like Materials Inventory, has same characteristics of the Merchandise Inventory account. We have already seen how costs are moved from the Work in Process Inventory account to the Finished Goods Inventory account. At this point Finished Goods Inventory takes on the characteristics of Merchandise Inventory. If we compare the Merchandise Inventory account in Figure 3-1 with the accounting for Finished Goods Inventory in Figure 3-3 we will see that the credit side of both accounts is handled in the same way. Both examples show that when goods or products are sold, the costs of those goods are moved from the Finished Goods Inventory account to the Cost of Goods Sold account. However, the accounting procedures affecting the debit side of the Finished Goods Inventory account differ from those for the Merchandise Inventory In a manufacturing firm salable products are produced rather than account. purchased. All costs debited to the Finished Goods Inventory account represent transfers from the Work in Process Inventory account. At the end of an accounting period, the balance in the Finished Goods Inventory account is made up of the cost of products completed but unsold as of that date.

# Chapter 3 Cost Accounting Cycle

Figure 3-3. Accounting for Finished Goods Inventory



For the merchandising concern, the cost of goods sold is computed as follows:

Beginning merchandise inventory
Plus: Purchases (merchandise)
Merchandise available for sale
Less: Merchandise inventory end
Cost of goods sold

The amount of purchases represents the cost of the goods which were acquired during the period for resale. Since the manufacturing concern makes rather than buys the product it has available for sale, the term "finished goods inventory" replaces "merchandise inventory" and the term "cost of goods manufactured" replaces "purchases" in determining the cost of goods sold.

Beginning finished goods inventory

Plus: Cost of goods manufactured

Total goods available for sale

Less: Finished goods inventory end

Cost of goods sold

Regardless of which costing system is used, a cost of goods manufactured (CofGM) statement is prepared to summarize the manufacturing activity of the period. Cost of Goods Manufactured for a manufacturing firm is equivalent to purchases for a merchandising firm. Although it may take different forms, essentially the CofGM statement is a summary of the direct materials, direct labor, factory overhead, and work-in-place (WP) account.

### **ELEMENTS OF MANUFACTURING COST**

Manufacturing or production costs are classified into three basic elements: (1) direct materials, (2) direct labor, and (3) factory overhead.

### **Direct materials**

The cost of material which become part of the product being manufactured and which can be readily identified with a certain product. Examples are: lumber used in making furniture, fabric used in the production of clothing, crude oil used to make gasoline and leather used to make shoes and bags.

Materials that cannot be readily identified with any particular item manufactured are called indirect materials. Examples are: sandpaper used in sanding furniture, and lubricants used on machinery. Classified also as indirect materials are materials that actually become part of the finished product but whose costs are relatively insignificant, such as thread, screws, rivets, bolts, nails, and glue.

### Direct labor

The cost of labor for those employees who work directly on the product manufactured, are classified as direct labor. Examples are: salaries of machine operators or assembly line workers.

The wages and salaries of employees who are required for the manufacturing process but who do not work directly on the units being manufactured are considered indirect labor. Examples are: wages and salaries of department heads, inspectors, supervisors, and maintenance personnel.

### Factory overhead

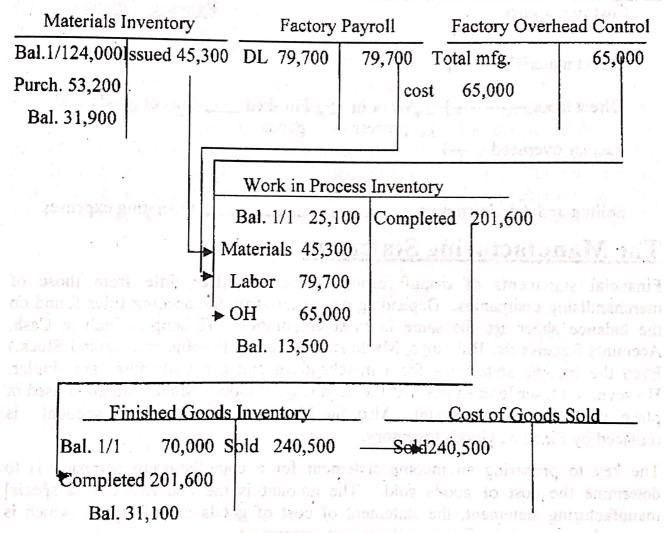
Includes all costs related to the manufacturing of a product except direct materials and direct labor. Examples are: indirect materials, indirect labor, and other manufacturing expenses, such as depreciation on the factory building, machinery and equipment, supplies, heat, light, power, maintenance, insurance, rent and taxes.

### Manufacturing Cost Flow

Product costing, inventory valuation, and financial reporting depend on a defined, structured flow of manufacturing costs. This manufacturing cost flow was

outlined in the discussion of the three manufacturing inventory accounts. Figure 3-4 summarizes the entire cost-flow process as it relates to accounts in the general ledger. The journal entries to make this cost flow operational will be illustrated in the latter part of this chapter.

Figure 3-4 Manufacturing Cost Flow



Here we concentrate on the general pattern of manufacturing cost flow, as shown in Figure 3-5. The cost flow begins with costs being incurred. Manufacturing costs start in many ways. They may be cash payments, incurred liabilities, fixed asset depreciation, or expired prepaid expenses. Once these costs have been incurred they are recorded as either direct materials, direct labor, or

basis for excounting for manufacturing coms. In this process all manufistaring

factory overhead costs. As the resources are used up, the company transfers its costs to the Work in Process Inventory account. When production is completed, cost assigned to finished units are transferred to the Finished Goods Inventory account. In much the same way, costs attached to units sold are transferred to the Cost of Goods Sold account. Before going on, compare the cost flow as it moves through the general ledger accounts in Figure 3-4 with the general pattern shown in Figure 3-5. Both figures show the same type of cost flow.

### Figure 3-5

ST FLOW - MANUFACTURING Cost incurrence	Expense Category
Direct materials}	i in ha some said bearing
Direct labor} Work in process Factory overhead}	Finished Cost of goods sold goods
Selling and Administrative	Operating expenses

## The Manufacturing Statement

Financial statements of manufacturing companies differ little from those of merchandising companies. Depending on the industry, the account titles found on the balance sheet are the same in most corporation. (Examples include Cash, Accounts Receivable, Buildings, Machinery, Accounts Payable and Capital Stock.) Even the income statements for a merchandiser and a manufacturer are similar. However, a closer look shows that the head Cost of Goods Manufactured is used in place of the Purchases account. Also, the Merchandise Inventory account is replaced by Finished Goods Inventory.

The key to preparing an income statement for a manufacturing company is to determine the cost of goods sold. The amount is the end result of a special manufacturing statement, the statement of cost of goods manufactured, which is prepared to support the figure on the income statement.

# Statement of Cost of Goods Manufactured and Sold

The flow of manufacturing costs, shown in Figures 3-1 through 3-4, provides the basis for accounting for manufacturing costs. In this process all manufacturing

costs incurred are considered product costs. They are used to compute ending inventory balances and cost of goods sold. The costs flowing from one account to another during the year have been combined into one number in the illustrations to help show the basic idea. In fact, hundreds of transactions occur during a year, and each transaction affects part of the cost flow process. At the end of the year, the flow of all manufacturing costs incurred during the year is summarized in the statement of cost of goods manufactured and sold. The statement gives the peso amount of costs for products completed and moved to Finished Goods Inventory during the year. The amount for cost of goods manufactured should be the same as the amount transferred from the Work in Process Inventory account to the Finished Goods Inventory account during the year. In the same way, the amount of cost of goods sold should be the same as the amount transferred from the Finished Goods Inventory account to the Cost of Goods Sold account during the year.

The statement of cost of goods sold for Figure 3-1 through 3-4 is shown below. Even though this statement is rather complex, it can be pieced together in four steps. The first step is to compute the cost of materials used. Add the materials for the period to the beginning balance in the Materials Inventory account. This subtotal represents the cost of materials available for use during the year. Then subtract the balance of the ending Materials Inventory from the materials available for use. The difference is the cost of materials used during the accounting period.

# Name of Company Cost of Goods Sold Statement For the year ended December 31, 2019

Direct materials used	
Materials Inventory, January 1	P 24,600
Add: Purchases	53,200
Total available for use	77,800
Less: Materials Inventory, December 31	32,500 P 45,300
Direct labor	79,700
Factory Overhead	65,000
Total manufacturing costs	190,000
Add: Work in process, January 1	25,100
Cost of goods put into process	215,100
Less: Work in process, December 31	13,500
Cost of goods manufactured	201,600
Add: Finished goods, January 1	<u>70,000</u>
Total goods available for sale	271,600
Less: Finished goods, December 31	31,100
Cost of goods sold – normal	P <u>240,500</u>

The second step is the computation of the total manufacturing costs for the year. The costs of materials used and direct labor are added to total factory overhead costs applied during the year. The third step charges total manufacturing costs into total cost of goods manufactured for the year. Add the beginning Work in Process Inventory balance to total manufacturing costs for the period to arrive at the total cost of work in process during the year. From this amount, subtract the ending Work in Process Inventory balance for the year to get the cost of goods manufactured. The term total manufacturing costs must not be confused with the cost of goods manufactured. Total manufacturing costs are the total costs for materials used, direct labor, and factory overhead incurred and charged to production during an accounting period. Total manufacturing costs of P 190,000 incurred during the current year are added to the beginning balance of the Work in Process Inventory costs of P 25,100. The P25,100 beginning balance, by definition, are costs from an earlier period. The costs of two accounting periods are now being mixed to arrive at the total cost of goods put into process during the year. The cost of ending products still in process (P31,100) are then subtracted from the total cost of goods put into process during the year. The remainder, P201,600,is the cost of goods manufactured (completed) during the year. It is assumed that the items in beginning inventory were completed first. Cost attached to the ending Work in Process Inventory are part of the current period's total manufacturing costs. But they will not become part of the cost of goods manufactured until the next accounting period when the products are completed. The fourth step is the computation of the cost of goods sold during the year, The cost of goods manufactured is added to the beginning balance of the Finished Goods Inventory to get the total cost of goods available for sale during the period. The cost of goods sold - normal is then computed by subtracting the ending balance in Finished Goods Inventory (cost of goods completed but unsold) from the total cost of goods available for sale. Cost of goods sold is considered an expense for the period in which the related products were sold.

# ILLUSTRATION OF COST ACCOUNTING CYCLE (manufacturing firm)

The Noeled Products Company is a small, newly organized company that manufactures dining tables and chairs. The company's products are sold to jobbers or wholesale distributors, who in turn sell them to retailers. The basic steps in the company's manufacturing process are as follows:

- 1. Lumber is cut to size for table tops, legs, seats, arms, and backs.
- 2. The individual pieces of cut lumber are painted in various bright colors.
- 3. The pieces are assembled into tables and chairs.

The beginning Statement of Financial Position for the company on January 1 of the current year is presented below..

Noeled Products Company Statement of Financial Position January 1, 2019

Assets	* * * .	Liabilities and Stock	cholders' Equity
Cash Building	P 80,000 750,000	Liabilities	$P = \{0, \dots, 0\}$
Machinery & equipme	nt <u>150,000</u>	Capital stock	980,000
Total assets	P980,000	Total liabilities and Stockholders' equity	P980,000

To make things easy, let us assume that the company for the month of January makes only one style of table and no chairs. The following transactions are completed for January and recorded, in summary form as follows:

1. Materials (lumber, paint, screws, lubricants, and solvents) are purchased on account at a cost of P 50,000.

Materials 50,000
Accounts Payable 50,000

This procedure differs in two ways from the recording of purchases for a merchandising firm. First, the debit is to a Material Inventory account instead of a Purchases account because the inventory system is perpetual. Second, the inventory account used is a control account. Some companies have hundreds of items in inventory. To keep a separate account for each item in the general ledger would crowd the ledger and make it hard to work with. At the time that entry 1 is posted to the general ledger, the individual stock cards are also updated.

2. During the month, direct materials (lumber and paint) costing P 40,000 and indirect materials (screws, lubricants for machine, and solvents for cleaning) costing P 1,900 are issued to the factory.

Work in Process 40,000
Factory Overhead Control 1,900
Materials 41,900

This entry shows that P40,000 of direct materials and P1,900 of indirect materials were issued. The debit to the Work in Process account records the cost of direct materials issued to production. Such costs can be directly traced to specific job orders. As the direct materials costs are charged to work in process, the amounts for individual jobs are entered on the job order cost sheets. Indirect materials are debited to the Factory Overhead Control account.

3. Total payroll for the month amounted to P36,000, consisting of P20,000 earned by laborers working on the product; P 7,000 for factory supervision; P 9,000 for sales and administrative employees. The entry to record the payroll and the payment to employees (ignoring payroll deductions) would be:

 Payroll
 36,000

 Accrued Payroll
 36,000

 Accrued Payroll
 36,000

 Cash
 36,000

Recording labor costs for a manufacturing company requires three journal entries. The first labor cost entry records the total payroll liability of the company. The second entry records the payment of the payroll liability established in the first entry. The third entry (No. 4) is now needed to account properly for labor costs. The P36,000 debited to the Payroll account must be moved to the production accounts. Gross direct labor costs are debited to Work in Process account, and total indirect labor costs (factory supervision) are debited to Factory Overhead Control. Payroll is credited to show that the total account has been distributed to the production accounts.

4. The entry to record the distribution or classification of the payroll would be:

Work in Process
Factory Overhead Control
Selling and Administrative Expense Control
Payroll
20,000
7,000
9,000
36,000

The wages earned by laborers working directly on the product are charged to Work in Process, while the salaries and wages of the factory supervisor, who do no work directly on the product, are charged to Factory Overhead Control. Sales salaries and administrative salaries are charged to Selling and Administrative Expense Control.

5. Depreciation expense for the building is 6% per year. The office occupies one-tenth of the total building, and the factory operation is in the other ninetenths. The depreciation expense for one month is recorded as follows:

Factory Overhead Control	3,375
Selling and Administrative Expense Control	375
Accumulated Depreciation – Building	3,750

Depreciation for the portion of the building used for factory operations =  $750,000 \times 6\% \times 1/12 \times 9/10$ ; for the portion used by the office=  $750,000 \times 6\% \times 1/12 \times 1/10$ 

6. Depreciation expense for machinery and equipment is 20% per year. All machinery and equipment is used in the factory for production purposes, so the depreciation expense is charged to Factory Overhead Control.

Factory Overhead Control	2,500
Accumulated Depreciation – Mach. & Equipt.	2,500

7. The cost of heat, light, and power for the month was P3,000.

Factory Overhead Control	2,700
Selling and Administrative Expense Control	300
Accounts Payable	3,000

The cost of heat, light, and power charged to Factory Overhead Control =  $3,000 \times 9/10$  and charged to Selling and Administrative Expense =  $3,000 \times 1/10$ 

8. Miscellaneous expenses for telephone, office supplies, travel, and rental of office furniture and equipment totaled P1,500

Selling and Administrative Expense Control	1,500	)
Accounts Payable	armstar Mar	,500

Many other expenses may be incurred by a manufacturing organization, but for purposes of simplicity, it is assumed there are no other expenses during the month. After posting the journal entries to the appropriate ledger accounts, the factory overhead account will reflect the following debits (as shown on the next page)

Transaction	Description	Amount
(2) (4) (5) (6) (7)	Indirect materials Indirect labor Depreciation of building Depreciation of machinery and equipment Heat, light, and power Total	P 1,900 7,000 3,375 2,500 <u>2,700</u> <u>P17,475</u>

14. Factory overhead is charged to production at 85% of direct labor cost:

Work in Process	17,000	
Factory Overhead Applied	•	000

The three elements of manufacturing cost – direct materials, direct labor, and factory overhead – are now accumulated in Work in Process, and the debits in the account are as follows:

Transaction		Amount
Direct materials Direct labor Factory overhead Total	eiter van valk Scoople et hefter word on Anterwal he S	P 40,000 20,000 17,000 P 77,000
	Direct materials Direct labor Factory overhead	Direct materials Direct labor Factory overhead

15. Assuming that all goods started in process have been finished, the following entry is recorded:

Finished Goods	77,000
Work in Process	77,000
	77,000

Assuming that 1,000 tables were produced during the month, the unit cost is P77.00. The unit cost for each element of manufacturing cost is calculated as in the computation on the next page.

Clarified &	<u>Total</u>	Units <u>Produced</u>		Unit Cost
Direct materials Direct labor	P 40,000 20,000	1,000 1,000	P	40.00 20.00
Factory overhead	17,000 P 77,000	1,000	P	17.00 77.00

If the same type of table is produced in future periods, the unit costs of those periods can be compared with the unit costs determined above, and any difference can be analyzed so that management might take appropriate action. The unit cost also serves as a basis for establishing the selling price of the tables. After considering the anticipated selling and administrative expenses, a selling price can be established that should provide a reasonable profit. If management determines that a 40% gross profit percentage is necessary to cover the product's share of selling and administrative expenses and earn a satisfactory profit, the selling price per unit, rounded to the nearest cent, would be computed as follows:

Manufacturing cost	77.2	P 77.00
Gross profit (40%)		30.80
Selling Price		P107.80

To continue with the example, assume that the following transactions take place in January in addition to those already recorded.

11. Costs of materials, utilities, and selling and administrative expenses paid amounted to P 34,000

	Accounts Payable Cash	34,000	34,000
12.	800 tables are sold to jobbers at a net price of P86,240		
	Accounts Receivable Sales	86,240	86,240
	Cost of Goods Sold Finished Goods	61,600	61.600

13. Cash totaling P55,000 is collected on accounts receivable

Cash

55,000

Accounts Receivable

55,000

The accounts in the general ledger will reflect the entries as follows:

Cash				Accounts Receivable				
Beg.	80,000	(3)	36,000	(12)	86,240	(13) 5	5,000	
(13)	55,000	(11)	34,000	•	31,240			
6.	5,000				0,0	in redi		
Materials				Work in Process				
(1)	50,000	(2)	41,900	(2)	40,000	(10)	77,000	
	8,100			(4)	20,000			
		161		(9)	17,000	1112		
Chair						or the	er ett di er etterel	
Finished Goods				Building				
(10)	77,000	(12)	61,600	Beg.	750,00			
	15,400							
, ,	100 1 have				170 1			
Acc	um. Deprec	iation-Bu	ilding		Machinery	& Eanin	ment	
4		(5)	3,750	Beg.	150,00		mont	
1,4,7		•			-3/10, 11/10	Ryll gryyn		
Accum	n. Depr'n – N	Mach. &	Equipment		Accou	ints Pays	_1 1	
	or A. Ve	(6)	2.500	(11)	34,00			
	1			7		1	50,00	
						(7)	3,00	
						(8)	1,50	
			•			\  :	20,500	

	Accrued Payr	oll	to Annal	Friet Ba	Capital Stock -	
(3)	36,000	(3)	36,000	re on the	Beg.	980,000
Fa	ctory Overhe	ad Contro		Sellin	g and Adm. Exp. (	Control
(2)	1,900			(4)	9,000	of area to be
4) 0	7,000			(5)	375 375	Aperusulari
5)	3,375	MU.Ucl.		(7)	300	. z(omilaati
6)	2,500		A LULA	(8)	• 1,500	a sauceal
7)	2,700	• • • •			den	
17	,475	.00.10		11,1	.75 -1 Ho.A. 234	
	Payrol	I, Harri			Cost of Goods S	old
3)	36,000	(4)	36,000	(12)	61,600	tare guide
	Sale			Fa	ctory Overhead A	applied
		(12)	86,240		(9)	17,000

Now let us compare the factory overhead of the two statements, the cost of goods sold statement on page 52 for Figure 3-1 through 3-4 and the statement of cost of goods sold for the illustrative problem which is shown on page 61. The factory overhead of the statement on page 61 is total actual factory overhead incurred for the period, while the factory overhead of the statement on page 71 is applied at 85% of direct labor cost. The predetermined overhead rate (85% of direct labor cost) was used to apply overhead to production. Two overhead accounts are used in the illustrative problem: Factory Overhead Control and Factory Overhead Applied. Factory Overhead Control was used to accumulate all actual factory overhead costs. The estimated amount charged to production was credited to Factory Overhead Applied. After determining the balance of each general ledger account, a trial balance is prepared to prove the equality of the debits and credits.

# Noeled Products Company Trial Balance January 31, 2019

the table of table	P 65,000		
Cash	31,240		
Accounts Receivable	15,400		
Finished Goods	8,100		
Materials	750,000		
Building	750,000	F	2.750
Accumulated Depreciation – Building Machinery & Equipment	150,000		3,750
Accumulated Depreciation - Mach. & Equipt.			2,500
Accounts Payable			20,500
Accrued Payroll			0
Capital Stock			980,000
Sales			86,240
Cost of Goods Sold	61,600		
Factory Overhead Control	17,475		
Factory Overhead Applied		ah	17,000
Selling and Administrative Expense Control	11,175	-	
	P1,109,990	P	1,109,990
		. =	

From the trial balance, financial statements are prepared as follows:

### Noeled Products Company Statement of Comprehensive Income For the month ended January 31, 2019

Sales	
Less: Cost of Goods Sold (Schedule 1)	P 86,240
Gross Profit	62,075
	24,165
Less: Selling and Administrative Expenses	27,105
Calling and administrative and at	the second of the
Depreciation - Building	
Heat, Light and Power	State to be have
Miscellaneous 300	0
Net Income	0 11,175
14ct modile	P12,990
	112,550

### Schedule 1

Noeled Products Company
Cost of Goods Sold Statement
For the month ended January 31, 2019

Direct materials used:	•	Carlo Dine		,
Purchases		P 50,000		
Less: Materials, January 31 P	8,100			
Indirect materials	1,900	10,000	P	40,000
Direct labor	TO ALTER	brail to be		20,000
Factory overhead		51 (취임) 조기 (m)		17,000
Total manufacturing costs/Cost of g	oods man	ifactured		77,000
Less: Finished Goods, January 3	1			15,400
Cost of Goods Manufactured and So	ld – norma	l sa Grendau	1	61,600
Add: Under-applied factory overhea		ente e de Min		475
Cost of goods sold – actual	<del>r</del> am vice 6; Immerse ori		P	62,075

Noeled Products Company Statement of Financial Position January 31, 2019

#### **ASSETS**

Current Assets			CE 000
Cash Cash	124.) Alencar con	P	65,000
Accounts Receivable	PRIOR SELECTION		31,240
Finished Goods	a late de la companie		15,400
Materials	a three years of the	Delica of its	8,100
Total current assets	e dinade d		119,740
	di Allando.		7600 20
Plant and Equipment			A HINE
Building	P 750,000		
Less: Accumulated Depr'n	3,750	746,250	
Machinery & Equipment	150,000		
Less: Accumulated Depr'n	2,500	147,500	893,750
Total Assets	3	<u> </u>	1.013.490
I ONIT VISSOR			

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17,475

# Liabilities and Stockholders' Equity

Current Liabilities	P	20,500
Accounts Payable	P 980,000	
Stockholders' Equity Capital Stock	12,990	992,990
Retained Earnings	P	1.013.490
Total Liabilities and Stockholders' Equity	A could red	

The cost of goods manufactured/completed divided by the number of units produced/completed will give the cost to manufacture per unit of the product, which is equivalent to purchase price for a merchandising concern.

The format of the income statement for a manufacturer is not significantly different from that for a merchandiser. In the income statement of a manufacturing concern the cost of goods sold is usually shown as one figure, supported by the cost of goods sold statement, which is also the general procedure in a published report.

At the end of the period, we compare the total of the Factory Overhead Control account and the Factory Overhead Applied account. In our example the factory overhead control(P17,475) is greater than the factory overhead applied (P17,000), that is why we have an underapplied factory overhead which is considered unfavorable because the tendency is to increase the cost of goods sold. An increase in the cost of goods sold will lead to a decrease in the gross profit. However, if the factory overhead control account is less than the factory overhead applied, then what we have is overapplied factory overhead which is considered favorable because the effect is a decrease in the cost of goods sold thereby increasing the gross profit. We assume, in our example, that the company is closing its underapplied/overapplied account at the end of the year, so no entry is made at the end of the month. If the company is closing the factory overhead control and factory overhead applied account at the end of each month, the following entry will be made at the end of the month.

Factory overhead applied	gambile is
Underapplied factory overhead	17,000
Factory overhead control	475
- dotory overneuce control	

At the end of the year, the total underapplied (or net under/overapplied overhead account is closed to Cost of Goods Sold account. If the amount of the under/over-sold account, Finished Goods account, and Work in Process account, according to the balances at the end of the period.

From the cost of goods sold statement, the following different equations are derived:

1. Materials, beg. + Purchases	Total materials = available for use	Materials used + Materials, end
2. WP, beg. + Total mfg. cost	Total cost of = goods put into process	Cost of goods = manufactured + WP, end
3. FG, beg.  + Cost of goods manufactured	Total goods = available for sale	Cost of goods = sold + FG, end

The following formulas are also of importance with regards to the costs of goods sold statement.

- 1. Prime cost = direct materials used + direct labor cost. .
- 2. Conversion cost = direct labor cost + factory overhead
- 3. Total manufacturing cost = direct mat used + direct labor cost + factory OH

### Merchandising Companies compared to Manufacturers

Retailer companies purchase finished goods in saleable form, ready for sale to clients. Usually these finished goods require no additional processing. Sometimes little, if any, conversion before being sold to consumers. Example of retail companies are SHOEMART (SM), ROBINSON'S, AND RUSTAN'S. The retailers usually sell the products in the same form as when acquired if ever, what is added is the packaging. Manufacturers, like SAN MIGUEL CORPORATION, ASIA BREWERY, AND WESTINGHOSE convert the raw materials purchased, into finished goods by adding labor and overhead. Upon completion the finished goods are stored in the warehouse /and or displayed until sold. The cost accumulation begins when raw materials are placed into production. As work progresses on a product, the costs are accumulated in the firm's accounting books. At the point of sale, these products will flow from the inventory account to the Cost of Goods sold to the statement of comprehensive income. The output of manufacturers are the products sold by the retail companies.

Manufacturers compared to Service companies

A manufacturer accounts for production using three inventory accounts namely (1)materials inventory (2) work in process inventory (3) finished goods inventory. An accrual accounting system is essential so that total production costs can be accumulated as goods flow through the manufacturing process Upon completion, the units are transferred to Finished Goods Inventory. Upon the sale we transfer to Cost of Goods Sold. On the other hand, most service firms need only to track their work in process (incomplete jobs). Because services generally cannot be stored, cost of finished jobs are transferred immediately to the statement of comprehensive income to be matched against service revenue instead of being carried on the statement of financial position in a Finished Goods Inventory account. Example will be the accounting for audit firms and law firms

Although there are differences in the accounting for manufacturers, retailers, and service firms, each type can use management and cost accounting concepts and techniques in different ways. Managers in all firms engage in planning, controlling, evaluating performance, and decision making. Managers are also finding ways to reduce costs without sacrificing quality.

Basically the accounting for merchandising and manufacturing firms is the same. The main difference is the accounting for cost of goods sold. merchandising, we use Purchases (periodic inventory system) or Merchandise Inventory(perpetual inventory system) to record acquisition of merchandise for sale To determine the cost of goods we simply multiply the number of units sold by the acquisition cost (purchase price)

# **COST FLOW - MANUFACTURING FIRMS**

Cost incurrence	Expense Category
Direct materials}	nua de Maria esta como esta esta esta esta esta esta esta esta
Direct labor	Finished Cost of goods sold goods
Selling and Administrative	Operating expenses

### **COST FLOW - MERCHANDISING FIRM**

Cost incurrence	Expense category
Finished goods	Cost of goods sold
Selling and Administrative	Operating expense
COST FLOW - SERVICE FIRM Cost incurrence	Expense category
Direct materials }	
Direct labor	Cost of services
Factory overhead }	
Selling and Administrative	Operating expense

### ILLUSTRATIVE PROBLEM FOR A SERVICE FIRM

The Magic Glass is engaged in cleaning glass walls and windows of high rise buildings. The company incurs service overhead of P 200,000 per month. Magic Glass has 50 workers who work 200 hours each per month. In addition they spend P180,000 on gasoline for their trucks. Advertising and other marketing expenses amount to P115,000. Administrative costs are P 150,000 per month. The workers are paid P150 per hour. Revenues for the month amounted to P 4,450,000. All purchases, labor costs and revenues are on cash basis.

The following transactions take place during January, 2019	
1. Purchased direct materials	P325,000
2. Incurred and paid labor costs - direct labor costs	1,500,000
Supervisory labor	50,000
4. Incurred and paid other service overhead costs	200,000
5. Paid gasoline for the trucks	180,000
6. Paid advertising and other marketing expenses	115,000
7. Paid administrative expenses.	150,000
8. All jobs were completed and collected	4,450,000

Requirements
1.Prepare journal entries
2.Prepare the Statement of Comprehensive Income

### SOLUTION

1. Journal entries	实 B 1 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1. Purchases	325,000
Cash	325,000
Purchase of materials	
2.Direct labor	1,500,000
Service overhead	50,000
Cash	1,550,000
Payment of labor costs	The state of the s
3. Service overhead	200,000
Cash .	200,000
Overhead cost incurred	
4. Gasoline expense	180.000
Cash	180,000
Gasoline expense paid	100,000
5 Selling Expenses	115,000
Cash	115 000
Advertising and other marketing e.	115,000 xpenses paid
6.Administrative Expenses	150.000
Cash ·	150,000
Administrative expenses paid	150,000
7. Cash	4,450,000
Revenues	* * * * * * * * * * * * * * * * * * * *
Cash received from clients	4,450,000

# 2. Statement of Comprehensive Income

### Magic Glass

Statement of Comprehensive Income For the month of January, 2019

Revenues	P	4,450,000
Cost of providing services		<b>7</b> -1-1-1-1-1
Materials	P 325,000	
. Labor	1,500,000	
Service overhead	250,000	
Gasoline	180,000	2,255,000
Gross profit		2,195,000
Operating expenses		
Administrative	150,000	
Selling	115,000	265,000
Net Income		P 1,930,000

# **PROBLEMS**

Problem 1
List the items given below (1-15) and for each item indicate the appropriate letter or List the items given below (1-13) and 101 letter of which the item will appear. The letters, the schedule and/or financial statement (s) in which the item will appear. The schedule and financial statements are prepared on a yearly basis.

- A. Cost of goods sold statement
- B. Statement of Comprehensive Income
- C. Statement of Financial Position The following items are found in its ledger and accompanying data
  - 1. Direct labor
  - 2. Raw materials inventory, January 1
  - 3. Work in process inventory, December 31
  - 4. Finished goods inventory, January 1
  - Factory overhead applied
  - 6. Depreciation on office equipment
  - 7. Work in process inventory, January 1
  - 8. Finished goods inventory, December 31
  - 9. Cost of goods manufactured
  - 10. Cost of goods available for sale
  - 11. Cost of materials purchased
  - 12. Accumulated depreciation office equipment
  - 13. Direct materials used
  - 14. Total manufacturing cost
  - 15. Factory machinery

### Problem 2

Marvin Manufacturing Company has developed the following information for the year ended December 31, 2019.

Raw Materials Inventory, January 1 Purchases	P	175,000
		250,000
Raw Materials Inventory, December 31		125,000
Direct Labor		_
Factory Overhead (120% of direct labor cost)		270,000
Work in Process Inventory, January 1		
Work in Process Inventory, December 31		90,000
Finished Goods Inventory, December 31	3	120,000
Finished Goods Inventory, January 1		100,000
Finished Goods Inventory, December 31		
minade Chair C		80,000

Required: Cost of goods sold statement

#### Problem 3

Donna Company submits the following data	for May 2019	man a remain things in a second
Direct labor cost	2 101 14 may , 2019	P 160,000
Cost of goods sold	V 1997	550,000
Factory overhead - applied at 150% of	direct labor costs.	R SALST.
Inventories	May 1, 2019	May 31, 2019
Finished goods	P150,000	P122,000
Work in process	129,200	124,000
Materials	124,000	115,000

Required: Cost of goods sold statement.

#### Problem 4

Ram Company completed the following transactions for October, 2019

a) Purchased on account direct materials of P180,000.

b) The factory payroll was recorded. Direct labor P60,000; indirect labor P20,000. Employee payroll deductions were recorded as follows:

Withholding taxes	P 11,200
SSS Premiums	2,400
Phil Health Contributions	375
Pag-ibig Funds Contribution	1,620

c) Indirect materials of P20,000 were purchased.

d) Employer payroll tax expense is recorded as follows:

			•	
SSS Premiums	EST COLVE	P	TAL	3,600
Phil Health Contributions				375
Pag-ibig Funds Contributions				1,620

- e) Materials issued: direct materials P 120,000; indirect materials P10,000.
- f) Defective materials P5,000 were returned to vendors.
- g) Accounts payable totaling P148,300, including accrued payroll, were paid.
- h) Sundry factory expenses of P24,900 were recorded as liabilities.
- i) Factory overhead was charged to production at 120% of direct labor costs.
- j) Goods completed with a total cost of P180,000 were transferred to finished goods.
- k) Sales were P210,000 and cost P140,000 to produce.

### Requirements:

- 1. Entries to record the transactions given above.
- 2. Statement of cost of goods sold.

Daniel Lane 5		wing account balances:
Problem 5	C-11	swing account balances

Darvin Company contained the lone was	P	100,000
Cash		60,000
Accounts Receivable		35,000
Finished Goods		18,000
Work in Process		50,000
Materials		10,000
Accounts Payable	algha	8,000
Accrued Payroll		200,000
Common Stock		45,000
Retained Earnings	STUDENT.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

During January, 2019, the following transactions were completed.

a) Materials purchased on account, P 200,000.

b) Factory overhead incurred on account, P 35,000

c) Payroll for the period consists of: direct labor - P140,000; indirect labor -P30,000; sales salaries - P25,000; and administrative salaries - P15,000. Deductions from payroll were as follows:

Withholding taxes P	18,520
SSS Premiums	8,400
Phil Health Contributions	1,125
Pag-ibig Funds	6,300

d) P175,000 was paid for payroll

e) Computation of employer's payroll tax is as follows:

and District	Factory	Selling	Administrative
SSS Premiums	P 8,500	P 1,250	P 750
Phil Health	600	375	150
Pag-ibig Fund	5,100	750	450

f) Materials issued: direct materials - P185,000; indirect - P35,000.

g) Factory overhead was charged to production at 80% of direct labor cost.

h) Work finished and placed in stock - P410,000

i) Cost of goods sold - P385,000. The markup was 40% of cost.

j) Cash collected from customers, P405,000.

k) Payments for liabilities amounted to P 220,000, other than payroll.

### Requirements for Problem 5

- 1. Journal entries to record the above transactions.
- 2. Cost of Goods Sold Statement for January, 2019.
- 3. Statement of Comprehensive Income for January, 2019
- 4. Statement of Financial Position as of January 31, 2019.

#### Problem 6

A manufacturing company shows the following amounts in the cost of goods sold statement and the statement of comprehensive income for the year 2019

Materials January 1, 20 P 100,000	
Work in process	87,000
Finished goods 80,000	
Materials used	590,000
Cost of goods sold	750,000
Cost of goods manufactured	800,000
Total manufacturing costs	790,000
그 그 그 그 그 그 그는 그는 그는 그 그 그 그 그 그 그 그 그	[15](14](15] [15](15] [15](15](15](15](15](15](15](15](15](15](

### Required:

- 1. Work in process, January 1, 2019
- 2. Finished goods, December 31, 2019
- 3. Amount of materials purchased in 2019

### Problem 7

Madelyn Company manufactures unique, custom-made furniture. The company uses a job order system and applies overhead to production on the basis of direct labor cost. In computing a predetermined overhead rate for the year 2019, the company estimated manufacturing overhead to be P26 million and direct labor costs to be P20 million.

### Actual costs incurred during 2019

Direct materials used	P	30,000.000
Direct labor cost incurred		18,000,000
Insurance – factory equipment		500,000
Indirect labor	i.	7,500,000
Factory maintenance		2,000,000
Rent – factory building		11,000,000
Depreciation – factory equipment		2,000,000

Instructions - Answer each of the following 1. Why is Madelyn Company using a job order cost system?

1. why is madelyn Company using allocate its manufacturing overhead?

2. On what basis does the company allocate its manufacturing overhead? Compute the predetermined overhead rate for 2019. 3. Compute the amount of the under- or over applied overhead for 2019.

4. Determine the cost of goods sold given the following data December 31, 2019 ..... 1 2010

	January 1, 2012	3,201)
Work in process	P 5,000,000	P 4,000,000
Finished goods	13,000,000	11,000,000

### **Problem 8**

Revier Company's records were destroyed by fire. The controller was able to ascertain that sales for the nine month period ending September 30 were P 1,250,000. The company's suppliers indicated that merchandise costing P500,000 was delivered for the period. The company's statement indicated that the ending inventory for the previous accounting period was P260,000. The company was reimbursed by its insurance company for P200,000 worth of inventory destroyed by the fire. Insurance companies pay 80% of the cost for casualty of this nature. There were no other inventories on hand.

### Required

- 1. Estimate the cost of goods for this period
- 2. Amount of loss to the company

### MULTIPLE CHOICE

- 1. Cost of goods sold is
  - a. An expense
  - b. A period cost.
  - c. Is an asset.
  - d. None of the above.
- 2. For a manufacturing company, the cost of goods available for sale during a given accounting period is
  - a. The beginning inventory of finished goods.
  - b. The cost of goods manufactured during the period.
  - c. The sum of the above.
  - d. None of the above
- 3. Which of the following would not be classified as manufacturing overhead?
  - a. Indirect labor
  - b. Direct materials
  - c. Insurance on factory building
  - d. Indirect materials
- 4. The wage of a timekeeper in the factory would be classified as
  - a. prime cost
  - b. direct labor
  - c. indirect labor
  - d. administrative expense
- 5. As current technology changes manufacturing processes, it is likely that direct
  - a. labor will increase
  - b. labor will decrease
  - c. materials will increase
  - d. materials will decrease
- 6. Sales commissions are classified as
  - a. prime costs
  - b. period costs
  - c. product costs
  - d. indirect labor

- 7. For inventoriable costs to become expenses under the matching principle,

  - b. the product must be expensed based on its percentage of completion a. the product must be finished and in stock
  - c. the product to which they attach must be sold
  - d. all accounts payable must be settled
- 8. A manufacturing company reports cost of goods manufactured as
  - a. a current asset on the balance sheet
  - b. an administrative expense on the income statement
  - c. a component in the calculation of cost of goods sold
  - d. a component of the raw materials inventory on the balance sheet
- 9. Cost of goods manufactured in a manufacturing company is analogous to
  - a. Ending inventory in a merchandising company
  - b. Beginning inventory in a merchandising company
  - c. Cost of goods available for sale in a merchandising company
  - d. Cost of goods purchased in a merchandising company
- 10. If the amount of "Cost of goods manufactured" during a period exceeds the amount of "Total manufacturing costs" for the period, then
  - a. Ending work in process inventory is greater than or equal to the amount of the beginning work in process inventory
  - b. Ending work in process is greater than the amount of the beginning work in process inventory.
  - c. Ending work in process is equal to the cost of goods manufactured.
  - d. Ending work in process is less than the amount of the beginning work in process inventory.
  - 11. When incurred, factory labor costs are debited to
    - a. Work in process
    - b. Factory Wages Expense
    - c. Factory Labor
    - d. Payroll
  - 12. A company is more likely to use a job order cost system if
    - a. it manufactures a large volume of similar products
    - b, its production is continuous
    - c. it manufactures products with unique characteristics
    - d. it uses a period inventory system

- 13. Which of the following is the most appropriate for evaluating the performance of manufacturing department manager?
  - a. Costs controllable by the manager concerned
  - b. Cost of goods manufactured
  - c. Direct material cost
  - d. Total manufacturing cist
- 14. The most complex cost system is found in
  - a. Service oranizations
  - b. Manufacturing firms
  - c. Merchandising organizations
  - d. Government organizations
- 15. The term relevant range as used in cost accounting means the range over which
  - a. Costs may fluctuate
  - b. Relevant costs are incurred
  - c. Production may change
  - d. Cost relationship are valid

# MULTIPLE-CHOICE - PROBLEMS

For Cromwell Company, the predetermined overhead rate is 80% of direct labor cost. During the month, Cromwell incurs P210,000 of factory labor costs, of which P200,000 is direct labor and P10,000 is indirect labor. Actual overhead incurred was P200,000. The amount of overhead debited to Work in Process Inventory should be:

- a. P 200,000
- b. P 144,000
- c. P 168,000
- d. P 160,000

The following information was taken from Jeric Company's accounting records for the year ended December 31, 2019.

Increase in raw materials inventory	P 25,000
Decrease in finished goods inventory	45,000
Raw materials purchased	450,000
Direct labor payroll	200,000
Factory overhead	300,000

- 2. There was no work-in-process inventory at the beginning or end of the year. Jeric's 2019 cost of goods sold is
  - a. P 950,000
  - b. P 925,000
  - c. P 970,000
  - d. P 975,000

Items 3 through 5 are based on the following information pertaining to Glenn Company's manufacturing operations.

Inventories	3/1/19	2/21/10
Direct materials	P 36,000	3/31/19
Work-in-process	18,000	P 30,000
Finished goods	54 000	12,000
Additional information for the month of March	2016	72,000
Direct materials purchased	2010	
Direct labor payroll		P 84,000
Direct labor rate per hour		60,000
Factory overhead rate/direct labor hour	Properties	7.50
11041		10.00

# Chapter 3 Cost Accounting Cycle

- 3. For the month of March 2019, prime cost was
  - a. P 90,000
  - b. P120,000
  - c. P144,000
  - d. P150,000
- 4. For the month of March 2019, conversion cost was
  - a. P 90,000
  - b. P140,000
  - c. P144,000
  - **d.** P170,000
- 5. For the month of March 2019, cost of goods manufactured was
  - a. P218,000
  - b. P224,000
  - c. P230,000
  - d. P236,000

Items 6 to 8 are based on the following data of Matatag Company for the month of March 2019:

	March 1	March 31
Materials	P 40,000	P 50,000
Work in process	25,000	35,000
Finished goods	60,000	70,000

### March 1 to 31, 2019

120,000
108,000
378,000

- 6. The total amount of direct materials purchased during March was:
  - a. P 50,000
  - b. P170,000
  - c. P180,000
  - d. P220,000

- 7. The cost of goods manufactured during March, 2019 was:
  - a. P378,000
  - b. P388,000
  - c. P398,000
  - d. P428,000

Some selected sales and cost data for Alcid Manufacturing Company are given below:

Direct materials used	P	100,000
Direct labor		150,000
Factory overhead (40% variable)		75,000
Selling and administrative expenses		, ,
(50% direct, 60% variable)		120,000

- 8.. Prime cost was:
  - a. P 175,000
  - **b.** P 250,000
  - c. P 130,000
  - d. P 225,000
- 9. Conversion cost was:
  - a. P 150,000
  - **b.** P 225,000
  - c. P 250,000
  - **d.** P 270,000
- 10. Direct cost was:
  - a. P 225,000
  - b. P 250.000
  - c. P310,000
  - d. P 325,000
- 11. Indirect cost was:
  - a. P 75,000
  - b. P135,000
  - c. P 195,000
  - d. P325,000

- 12. Product cost was:
  - a. P 135,000
  - b. P250,000
  - c. P325,000
  - d. P370,000
- 13. Variable cost was:
  - a. P 250,000
  - b. P 280,000
  - c. P 352,000
  - d. P 370,000

During 2019, there was no change in either materials or the WP inventories. However, FG, which had a beginning balance of P25,000, increased by P 15,000.

- 14. If the manufacturing costs incurred totaled P 600,000 during 2019, the goods available for sale must have been:
  - a. P 585,000
  - b. P 600,000
  - c. P 610,000
  - d. P 625,000

During the month of May, 2019, Candace Mfg. Co. incurred P 30,000, P 40,000, and P 20,000 of materials, labor and factory overhead costs respectively.

- 15. If the CoGM was P 95,000 in total and the ending inventory was P 15,000, the beginning inventory of work in process must have been
  - a. P 10,000
  - b. P 20,000
  - c. P110,000
  - d. P 25,000

The Lion Company's cost of goods manufactured was P120,000 when its sales were P 360,000 and its gross margin was P220,000.

- 16. If the ending inventory of FG was P 30,000, the beginning inventory of finished goods must have been:
  - a. P 10,000
  - b. P 50,000
  - c. P130,000
  - d. P150,000

The gross margin for Cruise Company for 2019 was P 325,000 when sales were F 700,000. The FG inventory was P 60,000 and the FG inventory, end was P 35,000.

- 17. The cost of goods manufactured was
  - a. P300,000
  - b. P350,000
  - c. P230,000
  - d. P375,000

During the month of January, F Co,'s direct labor cost totaled P 36,000, and direct labor cost was 60% of prime cost.

18. If total mfg. costs during January were P 85,000, the factory overhead was:

- a. P 24,000
- b. P 25,000
- c. P 49,000
- d. P 60,000

During 2019, there was no change in the beginning or ending balance in the Materials inventory account for the DL Co. However, the WP inventory account increased by P15,000, and the FG inventory account decreased by P10,000.

19. If purchases of raw materials were P100,000 for the year, direct labor costs was P150,000, and manufacturing overhead cost was P 200,000, the cost of goods sold for the year would be:

- a. P 435,000
- b. P 445,000
- c. P 465,000
- d. P 475,000

During the month of March, 2019, Nape Co. used P 300,000 of direct materials. At March 31, 2016, Nape's direct materials inventory was P 50,000 more than it was at March 1, 2019.

20. Direct material purchases during the month of March 2019 amounted to:

- a. P 0
- b. P 250,000
- c. P 300,000
- d. P 350,000

# Chapter 3 Cost Accounting Cycle

21.C	alculate	the manufacturing overhead in	curred fo	r F&B Co.		
		Direct labor cost incurred		P 250	p. 1	
		Direct materials used		110	nou we	
		Beginning work in process		50		
		Ending work in process		300		
		Finished goods completed		170		
а	a. P 60					
t	D. P 410	o shirta yake da kata shiri	3 A zustan			
C	. P 560	0				
	l. P 580				a guardell	
_	. 1 50					
22 T	Determin	e the sales for the year.				
22. L	<b>&gt;~~~~</b>	Gross profit	Р	280,000		
		Ending inventory	r	120,000		
		Goods available for sale		180,000		
		Goods available for sale	barra James	100,000		
а	. P 300	0,000	ribs Tip.			
b	). P 340	0,000				
С	. P 400	0.000				
	l. P 460	-				
Giver	the foll	owing information:				
01701	10101011	Finished goods beginning	P	26,000		
		Finished goods ending		37,000		
		Cost of goods manufactured		27,000		
					arversion in a	da.
		ne cost of goods sold?				
a.	. P 115	5,500				
b	. P 116	5,000				
c.	P 153	3,000				
d						
		,				
Unific	o Manuf	acturing Company developed	the follow	wing data f	or the curre	nt year.
7	Work in	process inventory, January1	1	P	40,000	
ľ	Direct ma	aterials used			24,000	
		ctory overhead			48,000	
,	Annlied 1	factory overhead			36,000	
- 7	zhhiion i	oods manufactured			44,000	
7	Cotal mai	nufacturing costs			120,000	
	ו טומו ווומו	initiating acom				

- 24. Uniflo Company's direct labor cost for the year is
  - a. P12,000
  - b. P60,000
  - c. P36,000
  - d. P48,000

The following data relate to Maxine Manufacturing Company for the period:

wing data relate to iviaxine intallatation	P 2,400
Direct labor	1,700
Factory overhead	11,000
Work in process inventory, beginning	5,000
Work in process inventory, end	16,000
Cost of goods manufactured Sales	50,000
Finished goods inventory, beginning	9,000
Finished goods inventory, end	8,000
Total selling, general, and administrative costs	14,000

- 25. The amount of direct materials put into production during the period
  - a. P 6,700
  - b. P 5,600
  - c. P 4,800
  - d. P 5,900

# COST - VOLUME = PROFIT ANALYSIS

# **LEARNING OBJECTIVES**

Upon completion of this chapter, you should be able to

- Know the meaning of break even point
- Determine the break even point in number of units and in total sales
- Determine the number of units to be sold to attain a targeted profit
- Prepare a profit volume graph
- Prepare a cost-volume-profit graph
- Know meaning and computation of contribution margin
- Explain the impact of risk, uncertainty, and changing variables on cost-volume-profit analysis

Cost-volume-profit (CVP) analysis estimates how changes in costs (variable and fixed), sales volume, and price affect a company's profit. Managers find CVP very useful in making wise business decisions, predicting future conditions (planning)as well as in explaining, evaluating and acting on results (controlling) CVP is being used by companies to determine the break even point, which is the point of zero profit (no profit, no loss). At the break even point total revenue equals total cost, Companies, however, do not wish merely to "break even" on operations. The BEP is determined to serve as a point of reference. Knowing BEP, managers are better able to set sales goals that should result in profits from operations rather than losses. New companies normally experience net loss at the start and so they see their CVP analysis as a useful tool. Managers uses CVP analysis during times of economic trouble to help them pinpoint problems and find the appropriate solution.

CVP analysis helps managers answer several questions such as

- the number of units to be sold to break even
- the effect of changes in the fixed cost on the break even point
- the effect of changes in the sales price on the break even point

To fully understand the CVP relationship, we will classify cost according to their tendency to vary with production (MIXED, FIXED, AND VARIABLE.) instead

of their functional classification (manufacturing, selling, and administrative). We need only fixed and variable, so we have to segregate the variable and fixed components of the mixed cost by using any of the three methods: (high low point, scattergraph and method of least square). The focus is the company as a whole. The cost, a used in this discussion, refer to all costs of the company – production, selling, and administrative. So variable costs are all costs that increase as more units are produced and sold, including

- direct materials a.
- b. direct labor'
- c. variable overhead
- d. variable selling
- e. variable administrative

fixed cost will include

- a. fixed overhead
- b. Fixed selling
- c. Fixed administrative

A summary of revenue and cost assumptions is presented at this point to provide a foundation for BEP and CVP analysis

- Relevant range the company is assumed to be operating within the relevant range of activity specified for determining the revenue and cost information used. The relevant range refers to the range of activity over which a variable cost per unit remain constant or a fixed cost remains fixed in total.
- b. Revenue Revenue per unit is assumed to remain constant. Total revenue fluctuates in direct proportion to volume.

c. Variable cost - Variable are assumed to remain constant on a per unit basis. Total variable costs fluctuate in direct proportion to volume.

- d. Fixed cost Total fixed costs re assumed to remain constant regardless of changes in volume and because of this fixed cost on a per unit basis increases as volume decreases and decreases as volume increases.
- e. Mixed cost before

### THE BREAK EVEN POINT

As stated before the break even point is where total revenue equals total cost. At this point there is no loss and also no profit. The formula to use is based on the objective. If the objective is the break even in units, the formula is as shown on

### Chapter 4 Cost Volume Profit Analysis

BREAK EVEN POINT (UNITS) = Total fixed cost
Sales price - Variable cost/unit

BREAK EVEN POINT (UNITS) = Total fixed cost
Contribution margin per unit

if the objective is the break even in sales(pesos), the formula is

BREAK EVEN POINT (PESOS) = Total fixed cost
Contribution margin ratio

Or BREAK EVEN POINT (PESOS) = BEP in units x Selling Price/unit

For the formula to determine the BEP in pesos, the contribution margin is used. Contribution margin is the amount remaining after deducting the variable cost per unit from the selling price per unit. The contribution per unit is the amount contributed by each unit to the recovery of the fixed. The formula is

CONTRIBUTION MARGIN/UNIT = Selling price - Variable cost

CONTRIBUTION MARGIN RATIO = <u>CM PER UNIT</u> SALES PRICE/UNIT

# Illustrative problem 1

Nicolas Company produces a product that sells for P800.00. The variable cost is P360 for direct materials, P200 for labor, P50 for variable overhead and P 30,000 for fixed overhead. The units sold for the month is 500 unirts

### Required

- 1. Compute for total variable cost
- 2.Compute the total fixed cost
- 3. Compute for the BEP (units)
- 4. Compute for the contribution margin
- 5. Compute for the contribution margin ratio
- 6.Compute for the BEP (pesos)

### SOLUTION

1.Direct materials		P 350
Direct labor		200
Variable overhead		_50
Total variable cost		P 600

2. Total fixed cost

P30,000

3.BEP (UNITS) = <u>Total fixed cost</u> Selling Price/unit-Variable cost/unit

 $= \frac{P30,000}{P800-P600}$ 

= <u>150 units</u>

4.BEP (PESOS = Total fixed cost CM ratio

 $= \frac{P30,000}{25\%} = P$ 

4. Contribution margin/unit = Selling Price - variable cost

=P 800 - P600 = P200/unit

5. Contribution margin ratio = Contribution margin/unit
Selling price/unit

= P200/P800

= 25%

6.BEP (PESOS)

= Total fixed cost/CM ratio

= P30,000/25%

= P120,000

or BEP (PESOS)

= 150 UNITS X P800

= P.120,000

IF a statement is prepared for the break even sales, it will appear as

Sales Variable cost (150 x P600)	P 120,000 90,000
Contribution margin Fixed cost	30,000
Net income	30,000
	()

At break even sales, contribution margin equals fixed costs. Any excess of contribution margin over fixed costs is net income.

The statement of comprehensive income that is based on the separation of costs into fixed and variable is called the contribution margin statement which is used under direct costing or variable costing.

The contribution margin statement for the Nicolas Company assuming sales of 500 units will appear as

_ l # 3			
Sales (500 x P800)		I	400,000
Variable cost (500 x 600)	1		300,000
Contribution margin			100,000
Fixed cost			30,000
Net income		I	70,000

As seen on the statement, the contribution margin is P200/per unit, meaning each unit sold is contributing P200 (100,000/500) to the recovery of the fixed cost. Since the contribution margin of P100,000 is more than the fixed cost of P30,000, there is net income of P70,000. If contribution margin equals fixed cost, the company will break even, and if contribution margin is less than fixed cost, it will be net loss.

CVP analysis allows managers to do sensitivity analysis by examining the effect of various price or cost levels on profit. CVP analysis shows how revenues, expenses, and profits behave as volume changes.

If we express the contribution margin statement in form of a formula, then it will be

Net income = revenue - total variable cost - total fixed cost

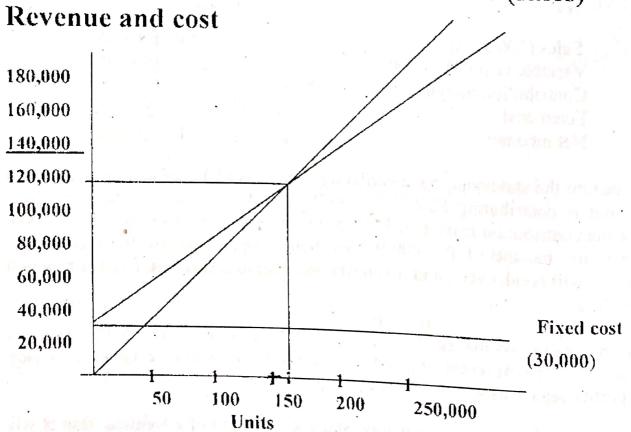
# Graph 1

# THE COST VOLUME PROFIT GRAPH

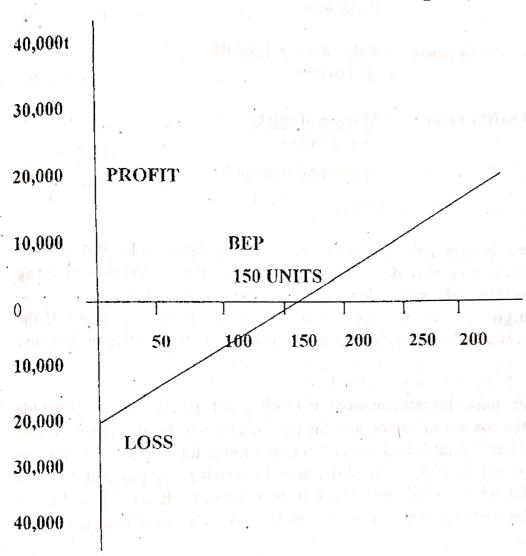
USING Illustrative Problem 1 on page 93 - Nicolas Company

Quantity	Sales	Variable	Fixed	Tot.Cost Profit(Loss)
50 x 800	= 40,000	30,000	30,000	60,000 (20,000)
100 x 800	= 80,000	60,000	30,000	90,000 ( 10,000)
150 x 800	= 120,000	90,000	30,000	120,000 0
200 x 800	= 160,000	130,000	30,000	150,000 10,000
250 x 800	= 200,000	150,000	30,000	180,000 20,000
300 x 800	= 240,000	180,000	30,000	210,000 30,000
350 x 800	=280,000	240,000	30,000	270,000 40,000

Revenue (sales)



Graph 2
Cost Volume Graph – Nicolas Company



# MARGIN OF SAFETY

Margin of safety is the units sold or revenue earned above the BEP volume. In simple words, it represents the number of units or amount of sales revenue that the company can absorb before incurring a loss. Using our illustrative problem 1, if the current sales is 500 units and the BEP is 150 units, the margin of safety is

Margin of safety = current salea – BEP sales = 500 units – 150 units = 350 units Margin of safety in pesos = 350 units x P 800 = P 280,000

OR Margin of safety in pesos = P400,000 - P 120,000 = P 280,000

Margin of safety ratio = Margin of safety
Total sales
=P280,000/P400,000
= 70%

All of these formulas (computations) mean that sales may decrease by 350 units, or decrease by P280,000 or may decrease by 70% before the company will break even. In the event that sales take a downward turn, the risk of suffering a loss is less if the margin of safety is large than if the margin of safety is small. If the margin of safety is small, managers must take actions to increase sales or decrease cost.

If two companies have the same amount of sales, it will not be safe to conclude that the BEP, the margin of safety, and the net income will be the same. If one company has a lower variable cost per unit and/or a lower total fixed cost, then its operating income will be higher. The differences in variable cost per unit and total fixed cost would result to different break even revenues. It would be safe to conclude that the company with the lower break- even sales would have a higher margin of safety.

# CVP ANALYSIS IN A MULTIPRODUCT

The CVP analysis is simple and easy to use if the company is producing and selling a single product only. However, few companies are producing a single product only, most companies are producing 2, 3, or more products. Even though CVP analysis becomes more complex with multiple products, the operation is reasonably straightforward. We simply convert the multiple product problem to a single product problem. The key to this conversion I to identify the expected sales mix, in units, of the products being produced and marketed. The sales mix is the combination of products being marketed by the company. The sales mix is

measured in terms of units sold. By defining the products as a package the multiple product problem is converted into a single product problem. To use the BEP in units, the package selling price and variable cost per package must be determined.

### **Illustrative Problem 2**

Selina Company produces three products A, B, and C with the following characteristics

and the last of th	PRODUCT A	PRODUCT B	PRODUCT C
Sales price/unit	P 10.00	P 16.00	P 18.00
Variable cost/uniy	6.00	10.00	14.00
Expected sales (units)	20,000	20,000	40,000

Total fixed costs are P 1,800,000. Assume that sales mix will be the same at all sales levels.

### Required

- 1. Compute for the break-even point in total units
- 2. Compute for the units A, B, and C must sell at break-even point
- 3. Compute for the total contribution margin if the company expects profit of P350,000.

### Solution

	PRODUCT A	PRODUCT B	PRODUCT C
Sales price/unit	P 10.00	P16.00	P18.00
Variable cost/unit	6.00	<u>10.00</u>	<u>14.00</u>
Contribution margin	P 4.00	P 6.00	<u>P 4.00</u>

1.Break- even in total units = <u>Total fixed cost</u> Weighted average contribution margin

= 400,000 units

Weighted average contribution margin = Total contribution margin

Total expected sales

= (20,000x4)+(20,000x6)+(40,000x4)80,000

= 4.50/unit

2. Sales in units of A, B, and C at break-even

 $A = 400,000 \times 25\% (200,000/800,000) = 100,000$  $B = 400,000 \times 25\% (200,000/800,000) = 100,000$ 

 $C = 400,000 \times 50\% (400,000/800,000) = 200,000$ 

Check

Sales  $(100,000 \times 10) + (100,000 \times 16) + (200,000 \times 18)$  6,200,000 Variable cost  $(100,000 \times 6) + (100,000 \times 10) + (200,000 \times 14)$  4,400,000 Contribution margin Fixed cost Net income 1,800,000

3. Expected net income
Total fixed cost
Total contribution margin

P 350,000 1,800,000 P 2,150,000

# BEP may be computed using this alternative solution

BEP (units) = Total fixed cost
Weighted CM per unit

= 400,000 units

Weighted CM per unit

A STATE OF THE STA	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		desired a series
Contribution margin/unit	P 4 00	В	С
Multiply by sales mix ratio	P 4.00	P 6.00	P4.00
Weighted contribution	25%	25^	
			50%
margin per unit	P 1.00	D 1 50	
•	V	P 1.50	P 2.00

### SALES AND UNITS WITH DESIRED PROFIT

Most companies would not want to break even only, the main objective is to earn profit. The break even point gives useful information to managers, but companies would want to earn income greater than P0. CVP gives us a way to determine how many units must be sold, or how much sales revenue must be earned to earn a particular net income The formula for computing BEP will not change much, we simply add the desired profit to the fixed cost and then divide by the contribution margin per unit. The formula will be

# Sales = Total fixed cost + desired profit Contribution margin/unit

### Illustrative Problem 3

The Gilas Company is trying to do CVP analysis with the following information for the month of August.

Sales	P	550,000
Total fixed cost		140,000
Selling Price		20
Variable cost per unit		12

### Required

1. Sales (units and amount) to break even.

2. Sales if the company desires a profit of P 120,000

### Solution

BEP(amount) = 
$$17,500 \times P20$$
  
=  $P350,000$ 

Or
BEP (amount) = Total fixed cost divided by contribution ratio
= P140,000/40%
= P350,000

Contribution margin ratio = 8/20 = 40%

2. Sales with profit = Fixed cost + Desired Profi
Contribution margin ratio

= P650.000

#### Check

Sales	P 650,000
Variable cost (650,000 x 60%)	390,000
Contribution margin	260,000
Fixed cost	140,000
Net income	P 120,000

The break-even point is affected by the three factors: selling price, variable cost, and volume of sales. Any change in any of these will definitely change the break-even point. There will be a decrease in BEP if total fixed cost decrease or unit contribution increase. BEP will increase if there an increase in fixed cost or a decrease in unit (or percentage) contribution margin.

# EFFECT OF CHANGE IN SALES PRICE Illustrative Problem 4

Nicolas Company produces a product that sells for P800.00. The variable cost is P600 per unit. The units sold for the month is 500 units. Assuming variable cost is still P600 and fixed cost remain at P30,000. The selling price this time increased to P850

### Required

- 1.Compute for BEP
- 2. Compare with Illustrative Problem 1

#### Solution

- 1. BEP (units) = Total fixed cost CM per unit
  - = <u>P30,000</u> P850-P600
  - = 120 units

2.BEP in Problem 1 is 150 units and with the new selling price the BEP decreased to 120 units because of the increase in the contribution margin/unit

### EFFECT OF CHANFE IN FIXED COST

Illustrative Problem 5Same data as in Problem 1 for NicolasCompany. The change is the amount of fixed cost that increased to P150,000 Selling price is still P800. Variable P600

Required

1.Compute for BEP

2.Compare with Illustrative Problem 1

#### Solution

1.BEP (units) = Total fixed cost CM per unit

= P50,000/200

= 250 units

2. With the increase in fixed cost to P50,000 the new BEP increased to 250 units. As we increase the fixed cost BEP increased also.

### EFFECT OF CHANGE IN VARIABLE COST PER UNIT

### Illustrative Problem 6

Same data as in Problem 1 Nicolas Companybut the change now is on the variable cost per unit

The selling price is still P800 per unit. Fixed cost is P30,000 but variable cost is P650 per unit

Required

1.Compute for BEP

2.Comparith Illustrative Problem 1

#### Solution

1.BEP (units) = Total fixed cost CM per unit

 $= \underbrace{P30,000}_{P800-P650}$ 

= 200 units

2. The BEP increased to 200 units as compared to 150 BEP in Problem 1 because of the decrease in contribution margin (due to increase in variable cost).

So we can conclude that BEP will increase if total fixed cost increase and BEP will decrease if total fixed cost decrease. If selling price increase BEP will decrease because each unit will be able to contribute more to the recovery of the fixed cost. An increase in selling price will result to increase in contribution margin and decrease in BEP.

Operating Leverage is the use of fixed cost to get higher percentage changes in profit as sales changes. The operating leverage is concerned with the relative mix of fixed cost and variable cost in an organization. Sometimes fixed cost can be traded off for variable costs. As variable cost is decreased, the contribution margin increases, making the contribution of each unit to the recovery of the fixed cost increase. Companies with lower variable costs by increasing the proportion to fixed cost will benefit with greater increases in profit as sales increase. On the other hand it is also true that companies with a higher operating leverage will experience greater reduction in profit as sales decrease. The formula to compute for the degree of operating leverage is

Degree of operating leverage = Contribution margin
Operating income

Using data from Illustrative Problem 3 on page 100, the operating leverage is

Degree of operating leverage = Contribution margin

Net income

= P260,000 P120,000

= 2.17

The greater the degree of operating leverage, the more that changes in sales will

#### PROBLEMS

Problem 1
Candace Company's projected profit for the coming year is as follows:

	TOTAL	PER UNIT
Sales	P 600,000	P 60.00
Variable cost	360,000	36.00
Contribution margin	240,000	P 24.00
Fixed cost	192,000	0 12370107 50
Operating income	P 48,000	n car family

### Required

- 1. Compute the variable cost ratio
- 2. Compute the contribution ratio
- 3. Compute the break- even point in units and the second of the second o
- 4. Compute the break even sales in pesos

### Problem 2

Monet Company plans to sell 10,000 motorcycle helmets at P1,000 each in the coming year. Variable cost is P 700 which includes direct materials, direct labor, variable factory overhead, variable selling, and variable administrative. Total fixed cost equals P148,500 which includes fixed factory overhead, and fixed administrative expenses.

### Required

- 1.Compute the break-even point in number of helmets
- 2.Compute for the break-even sales
- 3.Check your answer by preparing a contribution margin statement based on the break-even sales

### Problem 3

Reno sell a product for P1,050 with variable cost of P630. Total fixed cost amounted to P630,000.

- 1.Compute for contribution margin per unit
- 2. Compute for contribution margin ratio
- 3. Compute for the break-even point in units and in pesos
- 4.If Reno wants to earn P94,500, how many units must the company sell?

#### Problem 4

Green Meadows makes three types portable coolers. The company's total fixed cost P1,080,000. Selling prices, variable costs, and sales percentages of each type of cooler follow:

MODEL	SELLING	VARIABLE	SALES
MODEL	PRICE	COST	MIX
X100	P 8.800	P 7,600	30%
X950	14,800	12,000	50%
C 800	24,000	20,000	20%

1. What is the company's break-even point in units and pesos?

2.If the company has a target of 1M how many units of each type of cooler must be sold

#### Problem 5

Alonzo owns a barber where he employs five barbers and pays each a base rate of P2,000 per month. One of the barbers act as the manager and receives an extra P3,000 per month. In addition to the base rate, each barber is paid a commission of P20 per haircut. A barber can do an average of 6 haircuts a day. The barber shop is open 24 days a month. Other costs incurred are as follows:

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th
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ith and
agen began
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cut

Currently Alonzo charges P100 per haircut

### Required

- 1. Compute the break-even point ns a) number of haircuts snd in (b) total pesos 2.In March, 1400 haircuts were given, Compute the net income
- 3. Alonzo wants a net income of P25,000, compute the number of haircuts that
- 4.If Alonzo wants a net income of P40,000, and 1,500 haircuts were given, how

#### Problem 6

Guiller Company's projected profit for the coming year follows

	TOTAL	PER UNIT
Sales	P2,480,000	P 20.00
Variable costs	1,488,000	12.00
Contribution margin	992,000	P 8.00
Fixed cost	626,400	
Operating income	P <u>365,600</u>	

### Required

- 1.Compute the break-even point in units
- 2.Compute the break-even point in pesos
- 3. Compute the contribution margin ratio
- 4. Using the projected sales for the coming year, compute the margin of safety and margin of safety ratio.

### Problem 7

Statement of Comprehensive Income for Brooklyn Company for the current year is

Sales	P 750,000
Variable cost	600,000
Contribution margin	150,000
Fixed cost	100,000
Operating income	P <u>50,000</u>

### Required

- 1.Compute the break-even point
- 2. Compute the margin of safety
- 3. Compute the margin of safety ratio
- 4. Compute the degree of operating leverage
- 5. Suppose the company experiences a 30% increase in revenues, compute for the percentage change in profits

### MULTIPLE CHOICE - THEORIES

- 1. The systematic examination of the relationship among selling prices, volume of sales and production costs and profits is called
  - a. contribution margin analysis
  - b. cost-volume-profit analysis
  - c. budgetary analysis
  - d. gross profit analysis
  - 2. CVP analysis allows management to determine the relative profitability of a product by
    - a. determining potential bottlenecks in the production process
    - b. determining the contribution margin per unit and projected profits at different levels of production.
    - c. assigning costs to a product in a manner that maximizes the contribution margin
    - d. keeping fixed costs in an absolute minimum
- 3. The most important information derived from a breakeven chart is the
  - a. amount of sales needed to cover the variable cost
  - b. amount of sales needed to cover the fixed cost
  - c. relationship among revenues, variable costs, fixed costs at different levels of activity.
  - d. volume or output level at which the enterprise breaks even
- 4. Companies with a high degree of operating leverage
  - a. will have a more significant shift in income as sales volume changes
  - b. have fewer fixed costs'
  - c. have low contribution margin ratios
  - d. are less dependent on volume to add profits
- 5.A company's break-even point would be increased bu
  - a. an increase in fixed costs
  - b. a decrease in contribution margin ratio
  - c. a decrease in selling price
  - d. a decrease in variable cost per unit

- 6. If the variable cost per unit decreases while selling price decreases, the new variable cost ratio in relation to the old variable cost ratio will be
  - a. higher
  - b. lower
  - c. the same
  - d. not enough information provided
- 7. CVP analysis is a simple but powerful tool to assist management at different stages of the decision making process, Which of the following does not represent a primary of the CVP model>
  - a. Ability to compute the break even point
  - b. Ability to find target sales volume
  - c. Aids in evaluating tax planning alternatives
  - d. Aids in determining optimal pricing policies
- 8. A decrease in the margin of safety would be caused by
  - a.an increase in total fixed cost
  - b.in increase in total actual sales
  - c.a decrease in variable cost per unit
  - d.a decrease in the selling price per unit
- 8. If the fixed cost for a product decrease and the variable cost (as a percentage of peso sales) decrease, what will be the effect on the contribution margin ratio and the break-even point respectively

Contribution margin ratio Break-even point
a. Deceased Increased
b. Increased Decreased
c. Decreased Decreased
d. Increased Increased

10. If the sales mix shifts toward the higher contribution margin products, what would happen to the break-even point

the Crarica Continues stars to self a new product. The se

- a. decreases
- b. increases
- c. remains constant
- d. requires additional information

#### MULTIPLE CHOICE - PROBLEMS

The Avengers Company is trying to do cost volume profit analysis with the following information for the month of August

Sales	P1,100,000
	280,000
Total Fixed cost	660,000
Total variable costs	on the same of the
Unit price	40

- 1. The operating income of the Avengers Company is
  - a. P160,000
  - b. P190,000
  - c. P240,000
  - d. P440,000
- 2. What is the break-even point in units?
  - a. 14,000 units
  - b. 25,000 units
  - c. 28,000 units
  - d. 35,000 units
- 3.If the company desires a profit of P80,000, how many must be sold?
  - a. 30,000 units
  - b. 35,000 units
  - c. 36,000 units
  - d. 45,000 units
- 4. The margin of safety is
  - a. P100,000
  - b. P200,000
  - c. P300,000
  - d. P400,000

The Orange Company plans to sell a new product. The selling price is expected to be P 150 per unit. The company is able to produce 15,000 units but the company's marketing manager feels that a more realistic level of sales would be 12,000 units. Variable cost is estimated at P70 per unit. Total fixed costs will be P 900,000

- 5. The break-even sales
  - a. 10,000 units
  - b. 11,250 units
  - c. 16,000 units
  - d. 18,000 units
- 6. How much is the income (loss) if the company sells all the units it can produce a. P (87,500)
  - b. P122,500
  - c. P300,000
  - d. P330,000
- 7. If the company desires to earn P400,000 before tax at full capacity, what selling price must be charged
  - a. P 80.00
  - b. P 90.00
  - c. P 95.00
  - d. P100.00

Donna Company manufactures and sells two products: Product A and Product B. The two products have the following characteristics

	Product A	Product B
Selling price per unit	P 50.00	P30.00
Sales revenue	750,000	900,000
Variable cost per unit	30.00	24.00

Total fixed cost for the company was P320,000 but increase to P400,000 at production levels over 100,000. Selling price and variable cost per unit are the same at all production levels

- 8. Assuming a constant product mix, what is the break-even in units?
  - a. 10,000 units
  - b. 16,000 units
  - c. 25,000 units
  - d. 30,000 units

9. For the company to earn a profit of P400,000, assuming a constant product mix,

how many units must be sold

- a. 25,000 units
- b. 37,500 units
- c. 50,000 units
- d. 75,000 units

The following costs have been estimated based on sales of 30,000 units

	Total annual cost	Percent Variable
Direct materials	P 300,000	100%
Direct labor	250,000	100
Manufacturing overhead	250,000	50 00 00 00
Selling and administrative	150,000	30

- 10. What selling price will result in a 40% contribution margin
  - a. P33.25
  - b. P39.58
  - c. P52.78
  - d, P60.00
- 11. What selling price will yield a projected income of P50,000?
  - a. P35.20
  - b. P36.94
  - c. P41.80
  - d. P42.25

Happy Face Company has fixed cost of P500,000 per year, variable cost of P30 per unit, and a selling price of P50 per unit.

- 12. At a production level of 30,000 units, how much is the operating income?
  - a. P 50,000
  - b. P 100,000
  - c. P 150,000
  - d. P 200,000
- 13. The break-even sales in units
  - a. 10,000 uits
  - b. 25,000 units
  - c. 27,500 units.
  - d. 30,000 units

- 14. The number of units the company must sell to earn an income of P100,000?
  - a. 10,000 units
  - b. 25,000 units
  - c. 27,500 units
  - d. 30,000 units

Alexis Company operated at normal capacity during the current year producing 50,000 of its single product.. Sales totaled 40,000 units at a selling price of P20 per unit. Variable manufacturing cost were P8 per unit and variable selling and administrative were P 4 per unit. Fixed cost were incurred uniformly throughout the year and amounted to P188,000 for manufacturing and P64,000 for P64,000 for selling and administrative.

15. The break-even point in pesos is

- a. P 420,000
- b. P 470,000
- c. P 630,000
- d. P 732,000

The Presley Company manufactures two products, Product X and Product Y.. The following are projections for the coming year.

	Product X	Product Y
Sales	P 100,000	P 112,500
Sales in units	10,000	7,500
Expenses		
Fixed	P 20,000	P 24,000
Variable	60,000	75,000
Projected profit	20.000	14,000

16. Assuming that the facilities are not jointly used, the breakeven output (in units)for Product X would be

- a. 8,000
- b. 7,000
- c. 6,000
- d. 5,000

The Power Company sells its product at P15.00 per unit. The variable cost is P9.00 per unit. Total fixed cost is P12,000. Current sales amounted to P45,000

- 17. If sales decrease by 500 units, by how much would fixed expenses have to be reduced to maintain the current net income?
  - a. P7,500
  - b. P6.000
  - c. P3.000
  - d. P2,000
- 18.At a break-even point of 400 units, the variable costs P400 and the fixed costs were P200. What will the 401st unit sold contribute to profit before tax?
  - a. Po
  - b. P0.60.
  - c. P1.00
  - d. P1.50

The statement of comprehensive income for Blanche Company for the current year is presented below

Sales	P 400,000
Variable costs	
~	275,000
Fixed costs	200,000 200,000
Income before tax	
Switch and a control of	p 75,000

- 19. What is the degree of operating leverage of Blanche Company
  - a.3.67
  - b.1.45
  - c. 5.33
  - d. 1.67

The following information pertains to Ellery Company. Budgeted sales -P1,000,000, break even sales - P700,000, budgeted contribution margin -

- 20. The margin of safety for the Ellery Company is
  - a. P300,000
  - b. P400,000
  - c. P500,000
  - d. P600,000

# JOB ORDER COSTING

# LEARNING OBJECTIVES

Upon completion of this chapter, you should be able to

Define job order costing and identify the types of industries that would be most to use this system.

Demonstrate the mechanics of a job order costing system.

Differentiate among the forms used in the purchase and issuance of materials such as a purchase requisition, a purchase order, a receiving report, and a materials requisition.

Distinguish between the periodic and perpetual cost accumulation systems used to account for materials issued to production and for ending materials inventory.

Prepare a job order cost sheet

The job order cost procedure keeps the costs of various jobs or contracts separate during their manufacture or construction. The method is applicable to job order work in factories, workshops, and repair shops as well as to work by builders, construction engineers, shipbuilders, and printers. The cost unit is the job, the work order, or the contract; and the records will show the cost of each. The method presupposes the possibility of physically identifying the jobs produced and of charging each with its own cost.

A variation of the job order cost method is that of costing orders by lots. A lot is the quantity of product that can conveniently and economically be produced and costed. For example, in the shoe manufacturing industry, a contract is divided into lots, each lot being from 100 to 250 pairs of one size and style of shoe. The costs are then accumulated for each lot.

In job order costing, each job is an accounting unit to which materials, labor, and factory overhead costs are assigned by means of job order numbers. The cost of each order produced for a given customer or the cost of each lot to be placed in stock is recorded on a summary sheet called a job order cost sheet, or merely a cost sheet. This mater sheet is designed to collect the costs of materials, labor, and factory overhead applicable to a specific job

Cost sheets differ in form, content, and arrangement in each business. In each for, the upper section provides space for the job number, the name of the customer, a description of the items to be produced, the quantity, the date started, and the date completed. The main portion shows the cost of materials, labor, and factory overhead applied in each department or cost center. An example of a job-cost sheet is shown below.

Maria de la compania	Job	Cost Sheet			
ob Number _	sasionio i day.	Description	11 <u>11(f)</u>	R. St. of Control of Association	Bar Var
Date Started _		Date Compr	eted	Completed	Mg-1
	hypper at eart are.	Number of t	Jnite	s Completed	- And the second
a enda, y <b>n</b> uo	Ol trus mortautario e Dire	ect Materials		A TOT TRUCTURE AND	91,433 L
Date	Requisition No.	Quantity		Unit Price	Cost
TEL PERMIT	nazkaznikov o	Janus past vigit	2*1.	Karane es l'Arrigo	Soo rias
As I william	agas si a sasin w	T manifely	, de a	in a fire or all	astrob tyl
ad dans		rect Labor	1	Roma "Town on It of	con Tik
Date	Time Card No.	Hours	Hours Rate		Cost
	- to cold display	4 fig. see pri	g ask mill than the means		
<b>≅</b> 0110 - 10 - 11.	ally action of a color	DIE HELD ALL MAI	1 19	and the	to the
	Factory	Overhead		Artical Min. Mason	
_ Date	Activity Base	Quantity	A	pplication Rate	Cost
naskag sdir	Planner Walnes Live a	La hard testical	eg/-	A Same	
arvi ario		Land Contract		Garage County May	
ont on the	Cost Direct Materia Direct Labor Factory Overho Total Cost	nead	uj d	r costing and property	ape madi ape madi ape car are care

Several jobs or orders may be going through a factory at the same time, Each cost sheet is given a job number which is placed on each material requisition and labor labor, numbered for the job to which they apply, are totaled daily or weekly and entered on the cost sheets. The cost sheet eventually becomes a summary of all the costs, including factory overhead, involved in completing a job. The cost sheets are subsidiary records and are controlled by the work in process account. Jobs performed on the basis of customer specifications allow the computation of a profit or loss on each order. If jobs constitute production of a specific quantity for inventory, job order costing permits computation of a unit cost for inventory costing purposes.

# MAJOR SOURCE DOCUMENTS FOR JOB ORDER COSTING

## 1. JOB-ORDER COST SHEET

- a. These records accumulate product costs of specific units or small batches of units for both product costing and control purposes.
- b. The file of job-order sheets for uncompleted jobs serves as a perpetual book inventory and the subsidiary ledger for Work in Process Control.
- c. A separate cost sheet is prepared for each job.

### 2. MATERIALS STOCKCARD

- a. These records are the perpetual book inventory of costs and quantities of materials on hand.
- b. The file of materials stock cards for unused materials is the subsidiary ledger for Materials Control.
- c. A separate stockcard is prepared for each type of material on hand.

## 3. FINISHED GOODS STOCKCARD

- a. These records are the perpetual book inventory of costs and quantities of completed goods held for sale.
- b. The file of finished goods stock cards for unsold goods is the subsidiary ledger of Finished Goods Control.

# 4. FACTORY OVERHEAD CONTROL COST RECORD

- a. These records accumulate detailed manufacturing overhead costs by
- b. The file of these records for the accounting period is the subsidiary ledger for Factory Overhead Control.

- 5. MATERIALS REQUISITION, TIME TICKET AND CLOCK CARD
  - a. As the source documents for charging costs to jobs and department.
  - b. To aid in fixing responsibility for control and usage of materials and labor.

# ACCOUNTING PROCEDURES FOR MATERIALS

In manufacturing enterprises, the common practice is to record all materials and supplies in one control account, Materials or Stores. Procedures that affect the materials account involve the:

- 1. Purchase of materials and supplies.
- 2. Issuance of materials and supplies.
  - a. Direct materials
  - b. Indirect materials and supplies

Recording the purchase of materials.

The account debited when materials are purchased is Materials or Stores (instead of Purchases for periodic) and the account credited is Accounts Payable or Vouchers Payable. As materials are purchased, the amount is posted on the Material control account and at the same time the purchase is also entered on an individual materials ledger card/stockcard (a separate card is used for each material item) showing quantity received, unit cost, and total amount.

The entry to record the purchase of materials is:

Materials

xxxx

Accounts Payable

XXXX

An entry is made on the stock card under the Received section.

The entry to record the return of materials to vendor is:

Accounts Payable
Materials

xxxx

XXXX

An entry is made on the stock card under the Received section enclosed in parenthesis to indicate reduction in quantity.

Recording the issuance of materials.

When a job is started, the materials needed for the job are issued based on the materials requisitions prepared by the employees. A copy of the requisition is given to the storekeeper, which will serve as the basis for the materials to be issued. The job order number is shown on the materials requisition together with the specifics on type and quantity of materials required by each job. The quantity, unit cost, and total cost of each of the materials are entered on the issued section of the stock card.

The entry to record the issuance of direct materials is

Work in process xxxx

Materials xxxx

An entry is made on the stock card under the Issued section and also on the cost sheet - Materials.

The entry to record the issuance of indirect materials is

Factory overhead control xxxx

Materials xxxx

An entry is made on the stock card under the Issued section and also on the overhead analysis sheet.

## Shown below is an illustration of a material stock card.

,	Description Minimum					Acct. N		TG . 467	384 ) e	
	Data	R	eceived		9	Issued		E	Balance	4.2
	Date	Qty.	Unit Price	Amt.	Qty.	Unit Price	Amt.	Qty.	Unit Price	Amt.
	;						(II	(1. (C) (P)	it i posti	hai j
	10.747 - 270 3 - 1000 - 270	iro Willi	darr. T	i de d	and odd caregor	prikter) militer	o <mark>like kapital</mark> Programa	ार्थ । इ.स. १५५	to my	de l'est q sult f
en.	(0.18)08 3		,			10 1123	21/30 AL		Lair It.	es librole

# Shown below is an illustration of a material requisition slip.

	er en		a wearing
Quantity	Description	Unit Price	Amount
Quantity .	Description	To a control of the c	par garas sa mala para da
Approved b	y	Issued by	
Charge to J	ob/Dept	torced the issuance in Rong as Plead critical Rong as Plead	May All M. M.

The material control account may be summarized as follows:

### MATERIALS 1. Cost of direct materials 1. Inventory beginning issued 2. Cost of indirect materials 2. Purchase of materials issued. 3. Freight-in (using direct 3. Cost of materials returned Charging)

4. Cost of excess materials Returned from factory

to suppliers

The balance of the Materials account represents the Materials inventory at the end of the period under consideration. The amount should be equal to the total of the balances of all the material stock cards.

# ACCOUNTING PROCEDURES FOR LABOR

The accounting procedures for labor may be divided into two distinct phases:

- 1. Collection of payroll data, computation of earnings, calculation of payroll taxes, and payment of wages.
- 2. Distribution and allocation of labor costs to jobs, departments, and other cost classifications.

In most factories, clock cards/time records are used to record the days or hours worked by each employee. These clock cards/time records are used as the basis in computing the gross earnings of employees who are paid hourly wages. In addition to these clock cards, time tickets are prepared for each worker to determine the time spent for each job as basis in determining the amount to be charged to direct labor cost and indirect labor cost. The time tickets for various jobs are sorted, priced, and summarized, and the time ticket hours should be reconciled with the clock card hours.

### Shown below is an illustration of a job time ticket.

Employee Name Employee Number		Department	ken brongres et brongres <del>men den en</del> mil ausebroa <del>bron model edt yd</del> bebron
Time started	Time stopped	rege v lato) :	Job number
		214	etter as Suverannise Dinaiso
		y Arrest	
ig odi quinsb ile	to the Table	rd bomne as	enales bent coonwicts.

At regular intervals, usually daily or weekly, the labor time and labor cost for each job are entered on the job order cost sheets. For each payroll period - weekly, every two weeks, or monthly - the summary of employees' earnings and the liability for payment is journalized and posted to the general ledger.

The entry to record the payroll and the incurrence of liability is

Payroll	xxxx
Withholding Tax Payable	xxxx
SSS Premium Payable	xxxx
Phil Health Contribution Payable	xxxx
Accrued Factory Payroll	xxxx

The entry to record the distribution of payroll is

Work in process	xxxx	
Factory Overhead Control	xxxx	
Payroll		XXX

An entry is made on the cost sheet under the labor section

The entry to record the payment of payroll is

Accrued Factory Payroll	xxxx
Cash	xxxx

The work in process account is used to charge the jobs with the direct labor cost. Factory overhead control is charged for the indirect labor cost incurred. The tax withheld is computed based on the table provided by the Bureau of Internal Revenue. For the SSS Premiums and Phil Health Contributions, the table is provided by the Social Security System.

The clearing account for the total wages due to the factory personnel is the payroll account summarized as follows:

#### **PAYROLL**

lability for environ is southered and posted to the good lodges

- 1. Total wages and salaries earned by factory personnel during the payroll period
- Total payroll during the payroll period at the same time debiting work in process for direct labor and overhead for indirect labor

The account used to accumulate the liability for payroll or factory overhead is the Accrued Factory Payroll summarized as follows:

## ACCRUED FACTORY PAYROLL

- 1. Total amount of wages paid to factory | 1. Balancing beginning personnel at the time crediting accounts payable or cash

  - 2. Total amount of wages and salaries due to factory personnel at the same time debiting payroll.

### ACCOUNTING FOR FACTORY OVERHEAD

There are two accounts used - factory overhead control and factory overhead applied. Factory overhead control is used to accumulate actual overhead incurred, while factory overhead applied is used to accumulate estimated factory overhead applied to production. For factory overhead applied to production, a predetermined rate is used and this is computed using may of the following as a base:

- 1. Units of production
- 2. Direct material cost
- 3. Direct labor hours
- 4. Direct labor cost
  - 5. Machine hours

The predetermined factory overhead rate computed may be used for all departments in the company (blanket rate) or a rate may be computed for each department to fit the nature of the operations of the department (departmentalized rate).

Estimated factory overhead (Factory overhead applied) is used even if there is actual factory overhead because at the time the overhead is needed for costing of jobs completed, the actual overhead is not yet available (the actual will be known

only at the end of the month). The computation of the cost of each job will be done upon the completion of the job and this may be during the first week, second week, or third week of the month, and at this time, the actual overhead is not yet available because some of the items included in the actual overhead will be known only at the end of the month.

As items in the factory overhead control account are incurred, the Factory Overhead Control account is debited. The applied factory overhead entered on the job order cost sheet for each job is the basis for the following entry:

Work in process

Applied Factory Overhead

xxxx

xxxx

An entry is made on the cost sheet - factory overhead section

Some actual overhead costs, such as indirect materials, indirect labor, and payroll taxes, are debited to Factory Overhead Control as they are incurred. Other overhead costs, such as depreciation and expired insurance are debited to Factory Overhead Control when adjusting entries are recorded.

The controlling account for accumulating the indirect charges incurred in production is:

## MANUFACTURING OVERHEAD CONTROL

jobs complated, the actual guerhead is not votavalled cabe actual will be known

- 1. Cost of indirect materials and supplies issued from the warehouse at the same time crediting materials.
- 2. Cost of indirect labor at the same time crediting payroll.
- 3. Cost of indirect expense purchased from outsiders
- 4. Cost of other indirect expense incurred by the company.

1. Total debit footing at the end of the accounting period when closing the books.

Manufacturing overhead applied - account used for accumulating the total overhead charged to production during period.

MANUFACTURING OVERHEAD APPLIED

1. Total credit footings at the end of the accounting period upon closing of the books.

Cost of overhead allocated to production and computed by multiplying the actual factor being used during the period by the predetermined rate, at the same time, debiting work in process.

Over/under applied overhead - the difference between the actual overhead incurred and the applied overhead.

OVER/UNDER APPLIED OVERHEAD

1. Difference between the actual manufacturing overhead and the applied overhead when actual is more the applied.

Difference between actual manufacturing overhead and the applied overhead when the applied is more than the actual.

The closing of the Factory Overhead Control account and the Factory Overhead Applied account may be done at the end of the month or at the end of the year. If the closing is to be done monthly, the following are the entries:

End of the month:

Factory Overhead Applied xx
Under/over-applied overhead xx
Factory Overhead Control xx

End of the year:

Cost of Goods Sold
Under/over-applied overhead xx

If the closing is to be done yearly, the entry will be at the end of the year only. The entry is shown on the next page

End of the year:

Factory Overhead Applied Cost of Goods Sold Factory Overhead Control xx

XXX

XXX

xx

The variance is computed as follows:

Actual factory overhead

Less: Applied factory overhead

Variance

Variance

If actual is bigger than applied, the variance is called under-applied factory overhead (unfavorable), and this is taken as an addition to the Cost of Goods Sold in the statement. If applied is bigger than actual, the variance is called overapplied factory overhead (favorable) and this is taken as deduction from the Cost of Goods Sold in the statement. Whatever method of closing the control and applied account is used, the statement is always adjusted for the underapplied/(over-applied) on the statement. For purposes of preparing the Cost of Goods Sold statement, factory overhead applied is used because this is the amount charged to the work in process account. As stated above, the Cost of Goods Sold will be adjusted for the variance only at the end of the year. If the Cost of Goods Sold is stated in the problem, then it must be taken as normal, prior to the adjustment for the variance.

Work in process - controlling account used to record the flow of the elements of cost through the factory during a given period.

### WORK IN PROCESS

- 1. Cost of beginning inventory
- 2. Cost of direct materials issued to production at the same time crediting materials
- 3. Cost of direct labor applied to production during the period at the same time crediting the payroll account
- 4. Amount of overhead applied to production at the same time crediting applied overhead.
- 1. Cost of materials, labor, and factory overhead applied to jobs completed during the period at the same time debiting finished goods.
- 2. Cost of direct materials returned to the warehouse at the same time debiting materials.

The work in process account is used to accumulate during the month the total cost of materials placed in process, labor used, and factory overhead applied. The amounts entered on the cost sheet should equal the amounts debited to the work in process account during the month. As jobs are completed, the cost sheets for the corresponding jobs are totaled and the amount is now transferred to the finished goods account. The journal entry to record the cost of the jobs completed is:

Finished goods

Work in process

XXXX

xxxx

When the finished goods are delivered to customers, the sales and the cost of goods sold are recorded as follows:

Accounts receivable

XXXX

Sales

xxxx

Cost of goods sold Finished goods

xxxx

XXXX

If a job is delivered directly to a customer, the entries to record the completion of the job and the delivery to the customer may be merged into one as follows:

Cost of goods sold
Work in process

xxxx

xxxx

Finished goods - a controlling account used to record the flow of the cost of goods completed and transferred to the finished goods storeroom during the period.

# 1. Cost of inventory at the beginning

- 2. Factory cost of job order completed at the same time crediting work in process.
- 3. Cost of goods returned by the customer at the same time crediting cost of goods sold.
- ginning

  1. Cost of finished goods sold during the period at same time debiting cost of goods sold.

Cost of goods sold - an account used to accumulate the cost of finished goods disposed through sale to customers.

	and the same	1	Late Maria	co	ST OF GO	OD	S SOLD
1.	throu	gh se	finished ale to cust ting finish	goods omers at	disposed the same	1.	Cost of customer the finish

- 2. Adjustment for under-applied factory overhead
- 1. Cost of finished goods returned by customers at the same time debiting the finished goods account.
- 2. Adjustment of over-applied factory overhead.
- 3. Balance of the account at the end of the period at the same time debiting income summary.

**ILLUSTRATIVE PROBLEM:** 

The Northern Consolidated Company has the following balances as of January 1, 2019.

Materials	P 4,900
Work in process	4,600
Finished goods	6,000
Accrued factory payroll	200

### Details of the three inventories are:

Finished goods Commodity x - 2,000 units at P 3.00 P6,000 Work in process - Job No. 101 Materials: A - 200 units at P 5.00 1,000 B - 175 units at P 4.00 700 1,700 Direct labor: 290 hours at P 5.00 1,450 Factory overhead - applied at 100% of direct labor cost 4,600

#### Materials

Material A - 600 units at P 5.00	P	3,000
Material B - 350 units at P 4.00	d type	1,400
Indirect materials		500
ကြည်းကြည်းကြည်းကြည်းကြည်းကြည်းကြည်းကြည်း	<u>P</u>	4,900

The transactions for the month of January, 2019 are as follows:

- 1. Purchases for the month of January Material A 600 units at P5.50; Material B 800 units at P5.00; Indirect materials P700.
- Materials requisitioned and issued on a fifo basis amounted to P 7,000. Material A, 200 units (charged to Job 101); Material A, 600 units and Material B, 225 units (charged to Job 102; Material B, 425 units (charged to Job 103). Indirect materials amounted to P 1,000.
- 3. Material B returned to vendors, 70 units at P 5.00
- 4. Payroll during January amounted to P 10,300, of which P 2,000 is for Job 101; P 4,000 is for Job 102; P 2,000 for Job 103, and P 2,300 is indirect labor. Deductions are as follows:

SSS Premiums - P 412
Medicare Contributions - 225
Withholding taxes - 1,050

- 5. Factory overhead is applied on the basis of 100% of direct labor cost.
- 6. Jobs completed during the month Job 101 for 3,000 units of Commodity X and Job 102 for 5,000 units of Commodity Y.
- 7. Sales during January on FIFO basis 4,000 units of Commodity X at P 6.00 per unit and 4,000 units of Commodity Y at P 4.00 per unit.
- 8. Cash collection from customers P 35,000.
  - 9. Recorded the following liabilities: Factory overhead, P 4,800; Selling expenses, P 2,100; General expenses, P 1,500.
  - 10. Paid accounts P 9,500; payroll P 8,500.

8,663

Requirements:

Journal entries to record the above transactions. Job Order Cost Sheets. 3. Stock cards for materials and finished goods. 4. Cost of goods sold statement for the month of January. Journal entries: 8,000 1. Materials 8,000 Accounts Payable Materials purchased computed as follows: P 3,300 Mat. A - 600 units at P 5.50 -4,000 Mat. B - 800 units at P 5.00 -700 Indirect materials 8.000 7.000 Work in process 1,000 Factory Overhead Control Materials Materials issued to production. Job 101 1,000 Mat. A - 200 units at P 5.00 -Job 102 Mat. A - 400 units at P 5.00 - 2,000 200 units at P 5.50 - 1,100 900 4,000 Mat. B - 225 at P 4.00 Job 103 Mat: B - 125 units at P 4.00 -500 300 units at P 5.00 - 1,500 2,000 7,000 3. Accounts Payable 350 Materials 350 Materials returned to vendors. Payroll 10,300 SSS Premium Payable 422 Medicare Contributions Payable 225 Withholding Taxes Payable 1.050 Accrued Factory Payroll

Payroll for the month.

	Work in process Factory overhead Control	8,000
	Payroll	2,300
4 14 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Classification of payroll.	10,300
Belie	Classification of payroll.	LOW-NY LEED IN
5.	Work in Process	0.000
, 0,		8,000
not 3	Factory Overhead Applied	8,000
100000	Factory overhead applied to production	on.
6.	Finished goods	21,000
Ų.		21,000
	Work in Process	21,600
	Cost of jobs completed computed as  Job 101 Job 10	
		000
		000
.000	proceduration for the recognition of the procedural field of the form of the contract of the field of the fie	000
- 6/1/1/		000
7		40,000
7.		40,000
	Sales	70,000
	Sales computed as follows:	
	X - 4,000 at P 6.00 - P 24,000	
5	Y - 4,000 at P 4.00 - 16,000	North roll
U. e. H.	1 200 24 16 0 24 1	22.000
a de alla de la constante de l El la constante de la constante	Cost of goods sold	22,000
	Finished Goods	22,000
	Cost of units sold for the month:	and the same of the same and the same of t
	X - 2,000 at P 3.00 - P 6,000	
And the second	2,000 at P 3.20 - 6,400	the first and the second of the first of the second of
	Y - 4,000 at P 2.40 - 9,600	
		de la company
a	Cook .	35,000
8.	Cash Accounts Receivable	35,000
	Collection of accounts.	(0(40,5 ) (a)
	Collection of accounts.	
Shippy .	1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4,800
9	. Factory Overhead Control	2,100
	Selling Expense Control	
Sep 17 Sugar	General Expense Control	1,500
	Accounts Payable	8,400

10. Accounts Payable
Accrued Factory Payroll
Cash

9,500 8,500 .18,000

	Ma	terials		Housewill.	Work in Pr	ocess	
1/1	4,900 8,000	2) 8,	000 ( 350 550	1/1 2) 4) 5)	4,600 7,000 8,000 8,000	6)	6,000
	Finished	Goods			Cost of	Goods S	old
1/1 8)	6,000 21,600	7) 22,0 1/31 5,	000 600	7) T	22,000	3 4	
	Factory OF	I Control		r.h.	Factor	y OH Ap	plied
2)	1,000	4		Lie I	.50. ib) s	5)	8,000
4)	2,300	3. a. 2.4.	ă l				
9)	4,800	, days.	4.		districts		

### **STOCKCARDS**

### MATERIAL A

Received	Issued	Balance	
		600 at P5.00 P 3,000	
1)600 at P5.50 P 3,000	5.0	600 at P5.00 3,000	
		600 at P5.50 3,300	
	2) 600 at P5.00 3,000	1	
	200 at P5.50 1,100	400 at P5.50 2,200	

### MATERIAL B

Received		Issued		Balance	
1 100 21		1 / 1	enter construction	350 at P4.00	P 1,400
1)800 at P5.00	4,000	examples to a		350 at P4.00 800 at P5.00	1,400 4,000
	en e	2)350 at P4.00 300 at P5.00	1,400 1,500	500 at P5.00	2,500
3)(70) at P5.00	(350)		action of	430 at P5.00	2,150

INDIRECT MATERIALS

Received	Issued	Balance	
		500	
700		1,200	
	1,000	200	

COMMODITY X

Received	Issued	Balance	
and the second s	The second secon	2,000 at P3.00 P 6,000	
6)3,000 at P3.20 9,600	1964 St. 120 St. 1964	2,000 at P3.00 6,000 3,000 at P320 9,600	
and the second s	7)2,000 at P3.00 6,000 2,000 at P3.20 6,400	1,000 at P3.20 3,200	

COMMODITY Y

	COMMINDER		
Received	Issued	Balance	
6)5,000 atP2.40 12,000	5 1 4 1 km 1 1 1 1 2 5 5 6 6	5,000 et P2.40 12,000	
0,0,000	7)4,000 at P2.40 9,600	Sanch & Control	

### **COST SHEETS**

Job 101

(()) N	ν.	Labor Overhead	
Materials  1/1  A 200 of D5 00 D 1 000	1/1	1,450	1/1 1,450
A-200 at P5.00 P 1,000 B-175 at P4.00 700 2)	4)	2,000	5) 2,000
A-200 at P5.00 1,000 2,70	00	3,450	3,450
A STATE AND ADDRESS OF THE STATE OF THE STAT			

	Job 102	Overhead
Materials	Labor	4,000
2)	4,000	3)
A-400 at P5.00 2,000	and the second s	141
200 at P5.50 1,100	and the second s	
B-225 at P4.00 900	9-1	4,000
4,000	4,000	
*		

Job 103

300 103		Overhead			
Materials		Labor		5) 2,000	
2)	137 19/12	4)	2,000	5)	2,000
B-125 at P4.00	500	a mentoner i		A CONTRACTOR OF THE PARTY OF TH	
-300 at P5.00	1,500	1030 90	Ray of the Gillary	109	i di

# NORTHERN CONSOLIDATED COMPANY

Cost of Goods Sold Statement for the month ended January 31, 2019

Direct materials:		
Materials, January 1	P 4,900	HA STEPPEN SELS
Purchases P 8,000		· · · · · · · · · · · · · · · · · · ·
Less: Purchase returns 350	7,650	
Total available for use	12,550	
Less: Materials, January 31 4,550	* * * * * * * * * * * * * * * * * * *	
Indirect Materials 1,000	5,550	7,000
Direct labor		8,000
Factory overhead		8,000
Total manufacturing cost	810	23,000
Add: Work in process, January 1	the state of the second	4,600
Cost of goods put into process	P.1.039	27,600
Less: Work in process, January 31	(P)	6,000
Cost of goods manufactured		21,600
Add: Finished goods, January 1	me	6,000
Total goods available for sale		27,600
Less: Finished goods, January 31		5,600
Cost of goods sold - normal	William Marketine and	22,000
Add: Underapplied factory overhead		100
Cost of goods sold - actual		22,100

The under applied factory overhead is computed as follows:

Actual factory overhead  Less: Applied factory overhead	P	8,100
- ·		8,000
Underapplied factory overhead	$\mathbf{P}$	100

The closing of the Factory Overhead Control account and the Factory Overhead Applied account maybe done on a monthly basis or an annual basis. Whatever method is used, the statement is always adjusted for the underapplied (unfavorable) or the overapplied (favorable) factory overhead. Underapplied factory overhead is considered unfavorable because the effect is an increase in the cost of goods sold, thereby decreasing the gross profit. On the other hand, the overapplied overhead is considered favorable because the effect is a decrease of the cost of goods sold thereby increasing the gross profit.

If the closing is done on a monthly basis a special account, Under-and Overapplied Factory Overhead, will accumulate the differences period-to-period. At the end of the calendar or fiscal year, the balance of the under-and overapplied account will be closed to Cost of Goods Sold or allocated on a pro-rata basis to Work in Process, Finished Goods and Cost of Goods Sold. The remaining balance should be pro-rated if the amount of the balance would materially distort net income if it were charged entirely to Cost of Goods Sold. If a small balance remains in the Under-and Overapplied Factory Overhead at year-end, it may be closed directly to Cost of Goods sold because it will not materially affect net income.

### **OUESTIONS**

- 1. When is job-order costing appropriate, and how are costs accumulated in a job order cost system?
- 2. When is process costing appropriate, and how are costs accumulated in a process cost system?
- 3. How is cost accounting related to financial accounting?
- 4. Distinguish between cost of goods sold and cost of goods manufactured.
- 5. What is a job cost sheet and why is it useful?
- 6. What are the primary cost-accumulation T accounts used in a job-order costing system?
- 7. What document is used to support the transfer of direct materials from materials inventory to work in process?
- 8. In what way does the accounting treatment of direct materials and direct labor costs differ from that of factory overhead?
- 9. What documents constitute the supporting subsidiary ledger for work in process when using a job-order costing system?
- 10. What are the two entries typically required at the time finished units are sold?

TRUE OR FA	LSE
10 loss	Product costs are historical figures and therefore are of little use to
	the manager.
2.	A company producing furniture would probably use a job-order
	cost system.
3.	Both job-order and process costing systems utilize averaging
	concepts in computing unit costs.
4.	Most factory overhead costs are direct costs and therefore can be
	easily identified with specific jobs.
5.	The predetermined overhead rate is computed using estimates of
	cost and activity
6.	The cost of indirect materials used in production is added to the
1	MFG. OH account rather than added directly to Work in Process.
William Tropy	Actual manufacturing overhead costs are charged directly to the
a no del tor	Work in Process account as the costs are incurred.
<u> </u>	Selling and administrative expenses should be added to the
	Manufacturing Overhead Account.
9,	If more overhead is applied to Work in Process than is actually
	incurred, then overhead will be overapplied.
10.	All of the raw materials purchased during a period are included in
	the cost of goods manufactured figure.
matter translations	Any balance in the Work in Process account at the end of a period
	should be closed to Cost of Goods Sold.  If a job is not completed at year end, then no overhead cost should
12.	If a job is not completed at year end, then no overnead out
	be applied to that job.  Once production is completed, the job cost sheet can be discarded.
13.	Once production is completed, the job cost sheet can be added in a job order cost system, depreciation of factory equipment
14.	In a job order cost system, depreciation of lactory experience should be charged directly to the Work in Process account.
	should be charged directly to the work in 1 recess december
15.	The cost sheet is the support document for materials.  A job order cost system identifies costs with a particular job rather
16.	A job order cost system identifies costs with a particular job
	than a set time period.
17.	Manufacturing costs are generally incurred in one period and
y E .	recorded in a subsequent period.
18.	A job order cost system is most appropriate when a large volume of
· ·	uniform products are produced.
19	Job order cost sheets constitute the subsidiary ledger of the control
	account Work in Process inventory.
20	When raw materials are purchased, the work in Process inventory
	account is debited.

- 1. Under the job-cost system, purchases of direct materials are debited to: MULTIPLE CHOICE
  - a. Purchases
  - b. Work in Process Control
  - c. Factory Overhead Control
- 2. Under the job-cost system, issues of direct materials are debited to:
  - a. Factory overhead Control
  - b. Work in Process Control
  - c. Materials Control
- 3. In job-order costing, what journal entry should be made for the return to the stockroom of direct materials previously issued to production for use on a particular job?
  - a. debit Materials and credit Factory Overhead
  - b. debit Materials and credit Work in Process
  - C. debit Purchase Returns and credit Work in Process
  - d. debit Work in Process and credit Materials
- 4. Under a job-order costing system, the peso amount of the entry involved in the transfer of inventory from work in process to finished goods is the sum of the costs charged to all jobs:
  - started in process during the period
  - b. in process during the period
  - c. completed and sold during the period
  - d. completed during the period
- 5. In a job-order costing system, indirect labor used should be debited to:
  - a. Payroll liability
  - b. Work in Process Control
  - c. Finished Goods Control
  - d. Factory Overhead Control

continued the Work in Property more men

- 6. Which of the following is the basic document that is used to accumulate the cost of each order in job order costing:
  - a. Invoice
  - b. Purchase order
  - c. Requisition sheet
  - d. Job Cost sheet
- 7. What is the best cost accumulation procedure to use when many batches, each differing as to product specification, are produced?
  - a. Job order
  - b. Process which to easily large breez price a particle of a facility of a red
  - c. Actual
  - d. Standard
- 8. The most common treatment of under-or overapplied overhead is to close it to:

If the Physical State of the Superior State of the State

and process of despite best from the first of the

- a. Work in process
- b. Retained Earnings
- c. Cost of Goods sold
- d. Finished goods
- 9. It's two o'clock in the morning and you've been studying job-order costing for the past three hours. You drift off to sleep and in your first dream you visit JOB-ORDER COSTING LAND. You are a direct labor peso and are traveling through a giant ledger. By the time you finish your journey, which accounts will you travel through and in what order?
  - a. Work in process, Cost of goods manufactured, Finished goods, and Cost of goods sold.
  - b. Direct labor, Work in process, Finished goods, and Cost of goods sold.
  - c. Work in process, Finished goods, and Cost of goods sold.
  - d. Manufacturing overhead, Work in process, Cost of goods manufactured, and Finished goods.
  - e. Direct labor, Work in process, Finished goods, Cost of goods manufactured, and Cost of goods sold.

- 10. Which of the following production operations would be most likely to employ a job order system of cost accounting?
  - a. Toy manufacturing
  - b. Shipbuilding
  - c. Crud oil refining
  - d. Candy manufacturing
- 11. Someone told Marco de Santos, president of D'Santos Company, that underor over-applied manufacturing overhead can be allocated to three accounts. What are those three accounts:
  - a. Raw materials, Manufacturing overhead and Direct labor.
  - b. Raw materials, Finished goods, and Cost of goods sold.
  - c. Cost of goods sold, Work in process, and Finished goods.
  - d. Cost of goods sold, Work in process, and Raw materials.
- 12. Which of the following statements are False?
  - 1. A manufacturing company can use direct labor hours as an overhead base in one department and machine hours as an overhead base in another.
  - 11. A debit balance in the work in process account indicates that not all goods completed during the period were sold.
  - 111. The predetermined OH rate is computed by dividing estimated units in the overhead base by budgeted or estimated manufacturing overhead costs.
- a. 1 only
- strong a game redge. Be the measure fines are a large many a growth
  - c. 1 and 11 only
- d. 11 and 111 only
- 13. What accounts would be debited and credited when the direct materials are purchased on account?

a. Work in process

b. Direct materials

Work in process

Accounts pought

c. Materials Accounts payable

d. Work in process Accounts payable

14. What accounts would be debited and credited when the wages for indirect laborers are recorded?

<u>Debited</u>

Credited

a. Factory overhead

Wages payable

b. Factory overhead

Payroll

c. Payroll

Accrued payroll

d. Work in process

Payroll

- 15. Which of the following statements pertaining to job-order costing are TRUE?
  - 1. The issuance of indirect materials from the storeroom is recorded on jobcost sheets.
  - 11. Overapplied factory overhead can be properly disposed off with a debit to cost of goods sold and a credit to factory overhead.
  - 111.Both an overstated forecast of overhead and an understated forecast of units of the overhead base can cause overhead to be overapplied.
    - a. 1 only
    - b. 11 only
    - c. 111 only
    - d. 11 and 111 only 10 100 and
- 16. A material requisition form normally does not contain which of the following?
  - a. Vendor's name
  - b. Quantity requisitioned
  - c. Unit cost
  - d. Job number
- 17. A job order cost sheet normally does not contain which of the following?
  - a. Direct materials
  - b. Direct labor
  - c. Actual factory overhead
  - d. Applied factory overhead

- 18. In a job order costing system, payroll taxes deductions paid by the employer for factory employees are normally accounted for as
  - a. direct labor
  - b. factory overhead
  - c. indirect labor
  - d. administrative cost
- 19. Overhead applied was P120,000, while actual overhead was P124,000. Which of the following is always true of the above?
  - a. Direct labor activity was overestimated
  - b. Overhead was under applied by P4,000
  - c. Overhead was over applied by P4,000
  - d. The difference must be reported as a loss.
- 20. Which of the following is not a characteristic of job costing?
  - a. Each job is distinguishable from other jobs.
  - b. Identical units are produced on an ongoing basis.
  - c. It is not possible to compare actual costs with estimated costs.
  - d. Job cost data are used for setting prices and bidding prices.
- 21. Under a job order costing system, the cost of direct materials, direct labor and factory overhead must first flow through the
  - a. Finished goods account
  - b. Cost of goods sold account
  - c. Work in process account
  - d. Cost of goods manufactured account
- 22. The unit cost of a product, under job order costing, can be determined only

Applied Botons dverbook

- a. At the end of the manufacturing process
- b. Upon completion of a job.
- c. At the end of the month
- .d. At the pont of time

23. When a job is completed and all costs have been accumulated on a job cost sheet, the journal entry that should be made.

a.Finished Goods Inventory

Direct materials Direct labor Factory overhead

b. Work in Process Inventory Direct materials Direct labor Factory overhead

c.Raw Materials Inventory Work in Process Inventory

d.Finished Goods Inventory Work in Process Inventory

- 24. Cost of raw materials are debited to Raw Materials Inventory when
  - a. the materials are ordered
  - b. the materials are received
  - c. materials are put into production
  - d. the bill for the materials are paid
- 25. Under an effective system of internal control, the authorization for issuing materials is made

and or harresterious land marchesterical

- a. orally
- b. on a pre-numbered materials requisition slip
- by the accounting department
- by anyone on the

Problem 1
The Alexis Company had the following inventories on Aug. 1 of the current year.

p. 50,000
Finished goods

9. 50,000
37,000

Finished goods 37,000
Work in process 44,000
Materials

The work in process account controls two jobs

k in process account con-	1012 140 1002	Job 402
•	<u>Job 401</u>	P 11,200
Materials	P 6,000	
	5,000	6,000
Labor	- /	4,800
Factory overhead	4,000	P 22,000
	P15,000	1 22,000

The following information pertains to August operations:

1) Materials purchased on account, P56,000.

- 2) Materials issued for production, P50,000. Of this amount, P6,000 was for indirect materials; the difference was distributed: P11,000 to Job 401; P14,000 to Job 402; and P19,000 to Job 403.
- 3) Materials returned to the warehouse from the factory, P1,600, of which P600 was for indirect materials, the balance from Job 403.
- 4) Materials returned to vendors, P2,000.
- 5) Payroll after deducting P6,050 for withholding taxes, P3,200 for SSS Premiums, P750 for Medicare, and P2,400 for Pag-ibig, was P65,600. The payroll due the employees was paid during the month.
- 6) The payroll was distributed as follows: P20,800 to Job 401; P25,000 to Job 402, P21,000 to Job 403 and the balance represents indirect labor.
- 7) The share of the employer for payroll was recorded P4,000 for SSS Premiums, P750 for Medicare Contributions, and P2,400 for Pag-ibig Funds.
- 8) Factory overhead, other than any previously mentioned, amounted to P30,000. Included in this figure were P6,000 for depreciation of factory building and equipment, and P 1,900 for expired insurance on the factory. The remaining overhead was unpaid at the end of August.
- 9) Factory overhead was applied to production at the rate of 80% of direct labor cost.
- 10) Jobs 401 and 402 were completed and transferred to the finished goods warehouse

- 11) Job 401 was shipped and billed at a gross profit of 40% of the cost.
- 12) Cash collections from accounts receivable during August were P70,000. Requirements for Problem 1
  - 1. Journal entries to record the above transactions.
  - 2. job order cost sheets.
  - 3. Cost of goods sold statement.

#### Problem 2

to men a re

ABYL DEN

On December 31, 2019, after closing, the ledgers of Golden Shower Company contained these accounts and balances:

Cash	p 94,0	000
Accounts Receivable	100,0	000
Finished Goods	65,0	000
Work in Process	15,0	000
Materials	44,0	000
Machinery	70,6	500
Accounts Payable	118,	750
Common Stock	200,0	000
Retained Earnings	69,	850
Totalio Danings		

Details of the three inventories are:

Finished	goods	inventory:
----------	-------	------------

Item A - 2,000 units at P 12.5	O. manak	P	25,000	
Item B - 4,000 units at P 10.0			40,000	
Total		P	65,000	
Total	T.1. 101		Ic	h 1

not otal		T I IND
Work in process inventory:	<u>Job 101</u>	<u>Job 102</u>
Direct materials:	AND THE STATE OF THE	
1,000 units at P 5.00	P 5,000	0040 - 60 4/50
400 units at P 3.00		P 1,200
Direct labor: 1,000 hours at P 4.00	4,000	2,000
400 hours at P 5.00 Factory overhead:	nis and report has a	900

Factory overhead: Applied at P 2.00/hour Total	2,000 P11,000	800 P 4,000
Materials inventory:  Material X - 4,000 units at P	5,00 P	20,000

Material Y - 8,000 units at P 3.00 Total 

24,000

P 44,000 During January, 2019, these transactions were completed:

a) Purchases on account: Material X - 20,000 units at P5.20; Material Y - 24,000 units at P 3.75; indirect materials - P35,040.

b) Payroll totaling P220,000 was paid. Of the total payroll, P40,000 was for marketing and administrative salaries. Payroll deductions consisted of P31,000 for withholding taxes, P7,000 for SSS premiums, P 440 for Medicare contributions, P 6,600 for Pag-ibig Funds.

c) Payroll is to be distributed as follows: Job 101 - 10,000 direct labor hours at P 4.00, Job 102 - 16,000 direct labor hours at P5.00; Job 103 - 12,000 direct labor hours at P3.00; indirect labor - P24,000; marketing and administrative salaries - P40,000. Employer's payroll taxes are: SSS Premiums - 5%; Medicare contributions - 0.2%; and Pag-ibig Funds - 3%.

d) Materials were issued on a FIFO basis as follows: Material X - 20,000 units (charged to Job 101); Material Y - 24,000 units (charged to Job 102); Material X - 2,000 units and Materials Y - 5,000 units (charged to Job 103): (Note: Indirect materials Transactions are to be taken in consecutive order). amounted to P15.040.

e) Factory overhead was applied to Jobs 101, 102, and 103 based on a rate of P2.25 per direct labor hour.

f) Jobs 101 and 102 were completed and sold on account for P240,000 and P270,000, respectively.

g) After allowing a 5% cash discount, a net amount of P494,000 was collected on accounts receivable.

Marketing and administrative expenses (other than salaries) paid during the h) month amounted to P30,000. Miscellaneous factory overhead of P21,600 was paid. Depreciation on machinery was P4,000.

Payments on account, other than payroll paid, amounted to P170,000. **i**)

The over or underapplied factory overhead is to be closed. i)

#### Required:

- 1. Open T-accounts and record balances from the January 1 trial balance.
- 2. Journalize the January transactions.
- 3. Post January transactions to the general ledger, and subsidiary ledgers for materials and work in process.
- 4. Prepare a statement of cost of goods sold.

## Problem 3

J.A.N., Inc. uses a job order cost system. On May 1, the company has a balance in Work in Process Inventory of P 3,500 and two jobs in process, Job No. 101 P2,000 and Job 102 P1,500. During May, a summary of source documents reveals the following.

	IV.	<b>Iaterials</b>	La	bor
Job Number	Req	uisition Slips	Tim	e Tickets
101	P	2,500	P	2,900
102	1972.1 ,4	3,500		3,000
103		4,600 P	10,600	<u>5,800</u> P 11,700
General use		**************************************	800	1,200
Total	•,	<u>P</u>	11,400	<u>P 12,900</u>

J.A.N Company applies manufacturing overhead to jobs at an overhead rate of 80% of direct labor cost. Job No. 101 is completed during the month. Instructions:

- 1. Prepare summary journal entries to record
  - a) The requisition slips
  - b) The time tickets
  - c) The completion of Job No 101

#### Problem 4

Hercules Company begins operations on April 1. Information from job cost sheets shows the following

	Manu	facturing Costs	ASSIZUÇU	and the second section is a second
Job Number	April	May	<u>June</u>	Month Completed
101	P 5,200	P 5,400		May
AND THE RESERVE OF THE PERSON		3,800	P 2,000	June
102	4,700	5,000	Link .	April
103	1,200			
-		5,800	4,200	
104		5,200	3,800	Not yet complete
105				ing completion

Each job was sold for 25% above its cost in the month following comp Instructions:

- 1. Compute for the balance of Work in Process Inventory at the end of each
- 2. Compute for the balance of the Finished Goods Inventory at the end of each month
- 3. Compute for the gross profit for May, June and July

Star Wars Corporation obtains the following information from its records for the month of August. lated and sold

ini of riagust.	Jobs completed and 300 Job 330			
	Job 110	Job 220	P 20,000	
Direct materials cost	P 15,000	P 25,000 50,000	30,000	
Direct labor cost	40,000	30,000	20,000	
Factory overhead	25,000	4,000	10,000	
Units manufactured	5,000	25%	30%	
GP rate (based on sales)	20%	2370		

Required:

- 1. Prepare in summary form; the journal entries that would have been made during the month to record the above.
- 2. Prepare the schedules showing the gross profit or loss for August.
  - a. For the business as a whole.
  - b. For each job completed and sold.

#### Problem 6

The following account balances were taken from the general ledger accounts of the Ellery Corporation.

The same of the American Street	January 1	December 31
Materials	P 60,000	P 80,000
Work in Process	85,000	110,000
Finished Goods	120,000	90,000
Factory Overhead Control	- 1 / K <del>-</del> 1	330,000
Applied Factory Overhead		3 7 73
(applied at a rate of 80% of DL	-	320,000
Cost of Goods Sold	Mary 20 K are well	850,000
miramento:		

Requirements:

- 1. Journal entries to record the transactions that were entered in the above accounts for the year 2019.
- 2. Cost of Goods Sold Statement for the year 2019.
- 3. Entry to close the Factory Overhead Control account and Applied Factory Overhead to Cost of Goods Sold.

Problem 7

The following inventory data relate to Abner Corporation.

3 43 5 7 W	Inventori			<u>ies</u>	
		Beginning		Ending	
<ul> <li>Finished goods</li> </ul>	P	90,000	P	110,000	
Work in process		80,000		70,000	
Direct materials		95,000		90,000	
Revenues and costs for the	period	-			
Sales			teres e Pi	900,000	
Cost of goods available	e for sale	e egy a transfer		775,000	
Total manufacturing co	osts			675,000	
Factory overhead				175,000	
Direct materials used				205,000	

Required: Compute the following for the year:

- 1. Direct materials purchased
- 2. Direct labor costs incurred
- 3. Cost of goods sold
- 4. Gross profit

Problem 8

Assume the following relates to the Candy Corporation for the month of July

	Job No. 101	Job No.102	Job No. 103
In process, July 1 Materials Labor Overhead	P 40,000 60,000 75,000	P 30,000 40,000 50,000	ico o de la como de la
Cost added in July Materials Labor	55,000 80,000	80,000 95,000	92,000 115,000 th No. 101 and

Actual overhead incurred in July amounted to P 375,000. Job No. 101 and 102 were completed and transferred to finished goods warehouse in July. Overhead is applied using a predetermined overhead rate. Job 101 was sold for P 550,000.

Requirements: Compute for the following -

- 1. Work in process, July 1
- 2. Overhead assigned to production in July assuming same factory OH rate
- 3. Cost of goods manufactured
- 4. Cost of goods sold (actual)
- 5. Finished goods inventory, July 31

Problem 9			ation of a district
Miracle Company provides y	ou with the	following informa January 1	January 31
Inventories:			P 50,000
Materials		P ?	95,000
Work in process		80,000	78,000
Finished goods		60,000	and the at he was
January transactions:			
Purchases of mater	ials, P 46,000	)	000
Factory overhead (	75% of direc	t labor cost) P 63	,000
Selling and adm. E	xpenses (12.	5% of sales, P 25,	,000
Factory overhead c	ontrol, P 62.	R00	
Net income for Jan		10	
' Indirect materials u	sed, P 1,000		But the property of the
Requirements	, ,	· · · · · · · · · · · · · · · · · · ·	

- 1. Materials inventory, January 1
- 2. Cost of goods manufactured
- 3. Cost of goods sold (normal) for the month of January of the current year

#### Problem 10

The following were taken from the books of Nona Company.

the said buff of the property	The British E.	January 1	March 31
Raw materials	tel partie	P 268,000	P 167,000
Work in process		0	Ó
Finished goods	190 99 4	43,000	11 7
	(190,)	(100 units)	(300 units)
Direct materials used	000'87.	(	P1,847,700
Direct labor			2,125,800
Factory overhead			1,026,500
Sales	13 2000	(12,300 units	at P535.000)

The company uses the FIFO method of costing inventories.

#### Requirements:

- 1. The number of units manufactured
- 2. The cost of goods manufactured per unit
- 3. The cost of goods sold

## Problem 11

The following T-accounts have incomplete postings; however, the amounts shown therein are correct:

	Direct mate	erials	Work in process	
Beg. bal.	10,000 30,000	2,000	Beg. bal. 1,00	25,.000
granicati	hinters wi	becomeval ad t	these cours should	to them ment of
	Finishe	d goods	Cost	f goods sold
Beg. bal.	2,500	18,000		
				in the Table
of business	Factory over	head control	Acco	ounts payable
garnot te	4,200	arrest the life of	2,000	Beg. bal. 25,000
	hemores.			
	Factory over	rhead applied		a e out motio
0.40	)E	e da	7.0	Prode Story

## Additional information:

a. The debit of P15,000 to work in process represents direct materials issued for the month.

IDF dol tiffer be handed made unitalistic forms. The

- b. Factory overhead is applied at a rate of P0.50 per direct labor hour.
- c. Work ticket for the month totaled 10,000 direct labor hours. Factory workers receive P1.00 per hour.

Landenver vietos lo finished goods

## Required: Compute for the following

- 1. Direct materials inventory, end
- 2. Direct labor charged to production
- 3. Defective materials returned to suppliers
- 4. Work in process inventory, end
- 5. Finished goods inventory, end
- 6. Cost of goods sold

## MULTIPLE CHOICE - PROBLEMS

Dexter Company's 2019 manufacturing costs were as follows: P 100,000 70,000 Direct materials and direct labor 40,000 Depreciation of manufacturing equipment 15,000 Depreciation of factory building

Janitor's wages for cleaning factory premises

- 1. How much of these costs should be inventoried for external reporting purposes?
  - P 225,000 a..
  - 210,000
  - P 385,000 C.
  - 200,000

Peter Paul Company uses a job order cost system and applies factory overhead to production orders on the basis of direct labor cost. The overhead rates for 2019 are 200% for Dept. A and 50% for Dept. B. Job 123, started and completed during 2019, was charged with the following costs:

	Departin	Department			
	A	В			
Direct materials	P 25,000 I	5,000			
Direct labor	?	30,000			
Factory overhead	40,000	?			

- 2. The total manufacturing costs associated with Job 123 should be
  - P 135.000 a. .
  - P 180,000 b.
  - P 195,000 C.
  - P 240,000 d.

Jorelle Corporation has a job order cost system. The following debits (credits) appeared in the work-in-process account for the month of March of the current year

March	Description	Amount
1	Balance	Amount P 2,000
31	Direct materials	
31	Direct labor	12,000
31	Factory overhead	8,000
31	To finished goods	6,400 (24,000)

Jorell applies overhead to production at a predetermined rate of 80% based on direct labor cost. Job No. 30, the only job still in process at the end of March 2has been charged with direct labor of P1,000.

- 3. The amount of direct materials charged to Job was
  - a. P 12,000
  - b. P 4,400
  - c. P 2,600
  - d. P 1,500

Blue Beach Industries has two production departments. ABC and XYZ, and uses a job order cost system. To determine manufacturing costs, the company applies manufacturing overhead to production orders based on direct labor cost using the departmental rates predetermined at the beginning of the year based on the annual budget. The 2019 budget for the two departments was as follows:

	_ABC_	<u></u>
Direct materials	P 630,000	P 90,000
Direct labor	180,000	720,000
Factory overhead	540,000	360,000

Actual materials and labor costs of Job No. 676 during 2019 were as follows:

B' -t staviole	P	22,500
Direct materials		7.200
Direct labor - ABC		10,800
Direct labor - XYZ	in the second	10,500

- 4. What was the total manufacturing cost associated with Job No. 678 for 2019?
  - a. P 45,000
  - b. P 49,500
  - c. P 58,500
  - d. P 67,500

The Work-In-Process account of the Malinta Company follows:

	Work-	In Process	1	
April 1 bal. Direct materials Direct labor Factory overhead-applied	P 25,000 50,000 40,000 30,000	Finished Goods	P 125,450	

Overhead is applied to production at a predetermined rate, based on direct labor cost. The world is applied to production at a predetermined rate, based on direct labor cost. The work in process at April 30 represents the cost of Job No. 456, which has been charmed to production at a predetermined task. has been charged with direct labor cost of P3,000, and Job No. 789, which has been charged with direct labor cost of P3,000, and Job No. 789, which has been charged with applied overhead of P2,400.

5. The cost of direct materials charged to Job No. 456 and Job No. 789 amounted

to:

- a. P 8,700
- b. P 7,600
- C. P 4,500
- P 4,200 d.

6. The prime cost during the month amounted to: manufacturing averbend to production ordust as

- P 70,000 a.
- b. P 90,000
- P120,000 ¢.
- d. P145,000

The Diamond Company uses a job order cost accounting system. Overhead is applied to production at a predetermined rate of 80% based on direct labor cost. The following postings appear in the ledger accounts of the company for the month of September.

desart certai rates predecermined at the beginning

The 2019 budget for the two departments

26 13	1.0	Debit
Work in process, Sept. 1	•	P 30,000
Direct materials	pare occus too garanashu	60,000
Direct labor		50,000
Factory overhead	\	40,000
Cost of goods completed		(155,000)

Job No. 327 was the only job not completed in September, and it has been charged P4,600 for factory overhead.

7. Direct materials charged to Job No. 327 was:

- P 10.350 a.
- P 14,650 b.
- P 20,000 c.
- P 25,000 d.

- 8. Direct labor charged to Job. 327 was:
  - a. P 5,750
  - b. P 6,784
  - c. P 8,280
  - d. P 8,480

Hamilton Company uses job-order costing. Factory overhead is applied to production at a budgeted cost of 150% of direct labor costs. Any overapplied or underapplied factory overhead is closed to the cost of goods sold account at the end of each month. Job 101 was the only job in process at January 31 with accumulated costs as follows:

Direct materials	P	4,000
Direclabor	4 1,721	2,000
Factory overhead applied		3,000
Total	P	9,000

Jobs 102, 103, and 104 were started during February. Direct materials requisitions for February totaled P26,000. Direct labor costs of P20,000 were incurred for February. Actual factory overhead was P32,000 for February. The only job still in process at February 28, was Job 104, with costs of P2,800 for direct materials and P1,800 for direct labor.

- 9. The cost of goods manufactured for February was:
  - a. P 77,700
  - b. P 78,000
  - c. P 79,700
  - d. P 85,000

The following information relates to Job No. 2468, which is being manufactured by Daisy Co. to meet customer's order

	Dep	artment A	<u>Department B</u>
Direct materials used	P	5,000	P 3,000
Direct labor hours used		400	200
Direct labor rate per hour	P	4.00	P 5.00
Overhead rate per DL hour	P	4.00	P 4.00
Administrative and selling expenses		•	20% of full production cost
Profit markup		2	25% of selling price

- 10. The amount billed to the customer for Job 2468 is:
  - a. P 16,250
  - b. P 20,800
  - c. P 17,333
  - d. P 10,800

Abner Corporation has manufactured 100,000 units of compound X in 2019 at the following costs. Labor of P242,500 of which 93% represents direct labor. Materials of P 182,500 of which 90% represents direct materials. Opening work in process is P88,125. Closing work in process inventory is P67,500. Overhead is applied at 125% of direct labor cost.

- 11. The cost of goods manufactured is
  - a. P 671.150
  - b. P 692,306
  - c. P 651,036
  - d. P 629,900

Jolly Co. employs the job order cost system. Relevant data for the month just ended are summarized below.

Work in process beginning	P	100,000
Direct materials used for the month		200,000
Direct labor costs for the month		160,000
Overhead applied based on direct labor		120,000
Cost of goods completed		501,800
	Direct materials used for the month Direct labor costs for the month Overhead applied based on direct labor	Direct materials used for the month Direct labor costs for the month Overhead applied based on direct labor

- f. Ending work in process referred to Job 106 which was charged with direct labor of P12,000 and Job 107 charged with overhead of P9,600.
- 12. The cost of direct materials charged to Jobs 106 and 107 was
  - a. P 34,800
  - b. P 16,800
  - c. P 30,000
  - d. P 36,000

MV Crafts manufactures to customer order using the job order cost system. For the month just ended, it registered the following data:

Beginning work in process (5 partially completed	iobs) P 300,000
Orders completed (18)	2,400,000
Orders shipped (14)	2,000,000
Materials requisitioned for the month	1,700,000
Direct labor cost	800,000
Factory overhead rate	150% of direct labor cost

13. The ending work in process inventory was

- a. P 1,400,000
- b. P 500,000
- c. P 1,600,000
- d. P 700,000

Adams Company uses a job order costing system and the following information is available from the records. The company has 3 jobs in process: 501, 502 and 503.

Raw materials used P 120,000
Direct labor per hour P 8.50
Overhead applied based on direct labor cost 120%

Direct material was requisitioned as follows for each job, respectively: 30%, 25%, and 25%, the balance of the requisitions were considered indirect. Direct labor hours per job are 2,500, 3,100, and 4,200, respectively. Indirect labor is P33,000. Other actual overhead costs totaled P 36,000.

- 14. What is the total amount of actual factory overhead?
  - a. P 36,000
  - b. P 69,000
- c. P.93,000
- d. P 99,960
- 15. If Job 503 is completed and transferred, how much is the total cost transferred to Finished Goods Inventory?
  - a. P 96,700
  - b. P 99,020
  - c. P 108,540
  - d. P 139,540

Work in process of Alonzo Corporation on July 1 (per general ledger) is P22,800.

Per cost sheets:

Direct materials

Direct labor

Direct labor

2,500

Per cost sheets:

Job 101

Per cost sheets:

Job 101

Per cost sheets:

Job 101

Per cost sheets:

Job 102

Per cost sheets:

Job 100

Per

Amount charged to Work in process for July of the current year

Bear to HOIK I	ii process io	•	Job 103	<u>Job 104</u>
	<u>Job 101</u>	<u>Job 102</u>	6.000	4,500
Direct materials	3,000	2,000	A CONTRACTOR OF THE PARTY OF TH	2,000
Direct labor	1,000	1,500	2,600	2,000

Factory overhead is applied to production based on direct labor cost. Jobs 101 and 103 are completed during the month

- 16. Cost of goods put into process must be:
  - a. P 42,100
  - b. P 26,860
  - c. P 45,400
  - d. P 49,660
- 17. The cost of goods manufactured for the month of July is
  - a. P 21.600
  - b. P 15,400
  - c. P 25,560
  - d. P31,800

Marco Corporation has a job order cost system. The following debits (credits) appeared in the general ledger account work-in-process for the month of September,:

September 1 Balance	P 12,000
September 30, direct materials	40,000
September 30, direct labor and building by much	30,000
September 30, factory overhead	27,000
September 30, to finished goods	(100.000)

Marco applies overhead to production at a predetermined rate of 90% based on the direct labor cost. Job no. 232, the only job still in process at the end of September of the current year has been charged with factory overhead of P2,250.

- 18. What was the amount of direct materials charged to Job 232 as at end of September?
  - a. P2,250
  - b. P2,500
  - c. P4,250
  - d P9,000

Incomplete accounts of the Janice Company appear as follows on January 31.

Materials 1	Work in Process				
Bal. 15,000		Bal.	0	CofGM	40,000
Purch. 35,000		Materials	20,000		
- UC		Labor	?		one and
100 M 100 M		OH	?	1, 12	

AND TO	Finished (	oods	, <u></u>
Bal.	10,000	CofGS	20,000
CofGM	40,000	L	

Additional information

- a. There were 5,500 direct labor hours at the rate of P8.00 per direct labor hour
- b. Overhead is applied at the rate of P4.00 per direct labor hour
- 19. The January 31 of materials inventory should be
  - a. P 20,000
  - b. P 25,000
  - c. P 30,000
  - d. P 50,000
- 20. The total overhead that have been charged to work in process during January
  - a. P 17,000
  - b. P 22,000
  - c. P 33000
  - d. P 40000
- 21. The January 31 balance of the Work in Process account
  - a. P 46,000
  - b. P 75,000
  - c. P 76,000
  - d. P 82,000

The following information is taken from the records of the SBU Manufacturing

Company for the first quarter of 2019	Jan. 1, 2018	March 31, 2018
Raw materials inventory	P 32,200	P 34,100
aWork in process inventory	38,500	33,050 48,800
Finished goods inventory	44,600	254,000
Direct labor Factory overhead cost	i getaj. Li sama je sama je sama sama sama sama sama sama sama sam	236,900
Cost of goods sold	- North	678,300

Charlesed in arbitron at the rate of P4.08 per ofrest

19. The Sandary Di of materials inventory should be

- 22. The cost of goods manufactured during the first quarter was
  - a. P 676 100
  - b. P 243,000
  - c. P 682,500
  - d. P 713,350
- 23. The total cost of goods placed in process was
  - a. P 680,500
  - b. P 645,450
  - c. P 715,550
  - d. P 719,050
- 24. The cost of raw materials used was
  - a. P 263,150
  - b. P 186,150
  - range c., P. 224,650 of the street of begunde used aveil fact Landis vo later and T. D.S.
    - d. P 286,150

Job 213 required direct materials costing P20,000 and direct labor costing P5,000 (300 hrs.) Additionally factory overhead of P0.80 per direct labor hour cost is charged to the job. It was discovered that the labor cost shown was 125% of the correct amount due to erroneous overtime premiums.

25 .The correct cost of Job 213

- a. P 24,240
- b. P 27,200
- c. P 28,000
- d. P 28,000

# JUST-IN-TIME AND BACKFLUSH ACCOUNTING LEARNING OBJECTIVES

Upon completion of this chapter, you should be able to

Understand the JIT philosophy

- Know and understand the five key elements involved in the operation of a JIT system
- Differentiate the JIT system from the traditional costing system

Just-in-time means that raw materials are received just in time to go into production, manufactured parts are completed just in time to be assembled into products, and products are completed just in time to be shipped to customers. The IIT manufacturing philosophy originated in Japan (primarily by Toyota and Kawasaki) and is being increasingly utilized by American manufacturing companies

JIT requires raw materials to be delivered at exactly the points they are needed, and just when they are needed to initiate production. Partially processed goods are expected to move through the factory in such a way that goods come out of one operation just in time to be processed in the next operation. JIT calls also for the transfer of finished goods directly to the vehicles used to deliver them to customers, rather than to storage. Such arrangement completely eliminates the need for the warehouse space that has been considered an expensive part of any manufacturing operation. It also reduces the cost of handling, from the point of delivery of raw materials to the point where the finished product is shipped to the customer. Goods would be handled less often and the smaller quantities involved might eliminate the need for expensive bulk-moving equipment (such as forklifts).

JIT manufacturing is characterized by decisions made by companies to intentionally maintain relatively small inventory levels. Companies manufacturing inventory under the JIT philosophy attempt to minimize the time which elapses between the beginning of production to the completion of production and ultimate sale of inventory to the organization's customers. Thus, inventory production is normally "on demand". This type of production is consistent with the production process that is used by companies which wait for the receipt of customer orders before beginning production such as: custom furniture manufacturers, custom shipbuilders and custom homebuilders.

The distinguishing characteristic of JIT costing is that production costs are accumulated with inventory at later stages of the production process. The rationale for this difference is that JIT assumes that small (if any) quantities of direct materials, work-in-process, and finished goods inventories will be maintained.

Since JIT assumes that the work-in-process and finished goods inventory maintained by the organization will be minimal, labor and overhead are normally accumulated directly in cost of goods sold account. At the end of the period, the labor and overhead costs associated with any unsold or uncompleted items are "backed out" and included in either finished goods or work-in-process, respectively. For this reason, JIT costing is often referred to as backflush costing. There are five key elements involved in the operation of a JIT system.

- 1. A company must learn to rely on a few suppliers who are willing to make frequent (even daily) deliveries in small lots.
- 2. A company must improve its product flow lines by creating an individual flow line for each separate product.
- 3. A company must reduce the setup time between production runs. One way to do this is through employee training. Another way is through automation by creating a flexible manufacturing system (FMS). An FMS is just one part of the overall concept of computer-integrated manufacturing, in which a company's business functions are integrated with its manufacturing functions.
- 4. A company must develop a system of total quality control (TQC) over its parts and materials. In the absence of TQC, it would be impossible to successfully implement a JIT system. TQC starts with suppliers, who must inspect goods before they are shipped to ensure that the goods are free of defects. The company's own employees are responsible to inspect their own work before sending partially completed units on to the next workstation.

5. A company must develop a flexible work force. Since the plant layout in JIT environment is different from that of a conventional factory, workers must be multi-skilled. In addition to being able to operate al of the machines in a manufacturing cell, workers must also be able to perform routine maintenance on these machines.

An individual firm in the present environment can, by careful scheduling of production based on market projections (or, even better, based on actual orders), reduce the level of finished goods inventory. By using such production schedules and working with a limited number of suppliers of raw materials, the level of raw materials inventory can also be minimized. Processing time and the amount of work-in-process inventory can also be minimized by rearranging production facilities into manufacturing cells (minifactories) which include all the machines required to produce a particular part. Such an arrangement reduces the amount of movement partially-processed units required in the production process.

Just-in-time (JIT) costing differs from traditional costing with regards to the accounts used and the timing of cost recording. There are basically three major differences.

- 1. Instead of using separate accounts for Material and Work in Proces as in traditional costing JIT costing combines these into a Raw and in Process account.
- 2. Direct labor is usually considered a minor cost itme in a JIT setting so no separate account for direct labor is created. Direct labor and factory overhead are usually charged to a Conversion Cost account or sometimes direct to Cost of Goods Sold account.
- 3. In traditional costing overhead is applied to products as they are being produced and is recorded into the Work in Process account. In JIT costing, overhead is not applied to production until they are completed. When products are completed under JIT costing, labor and overhead is added to Cost of Goods Sold, since the goods are sold soon after production is completed

To compare JIT costing with traditional costing, assume that TRAMS Co. manufactures cellular telephones and uses a JIT production system. The following transactions occurred during January.

A. Trams purchased P170,000 of raw materials.

B. All materials purchased were requistioned for production

C Trams incurred direct labor costs of P 80,000

D Actual factory overhead costs amounted to P 122,000

E Trams applied conversion costs total P 202,000 (including direct labor cost of P80,000)

F. All telephones were completed and sold.

The transactions would be recorded in a traditional costing system as follows:

<b>A.</b>	Materials Accounts Payable	170,000	170,000
В.	Work in Process Materials	170,000	170,000
C.	Work in Process Accrued Payroll	80,000	80,000
D.	Factory Overhead Miscellaneous Accounts		122,000
E.	Work in Process Factory Overhead	122,000	122,000
	Finished Goods Work in Process	372,000	372,000
	Cost of Goods Sold Finished Goods	372,000	372,000

The general ledger (T-accounts) will appear as follows:

477(2)		terials	5		Work in	Process	
a)	170,000	.b)	170,000	b)	170,000	f)	2,000
		,	ø	c)	80,000		
		1	का क्षेत्रकार्य है।	e)	122,000	Tequalin	l misnon of
				in the second	with the second	<b>,</b>	
A way	Finisl	ped G	oods	To all the same	Factory Ove	rhead	Copyrian and the same
f)	372,000	f)	372,000	d)	122,000	e)	122,000
		98.5				Mr. V	
Marine Street	Accrued	Payro	II.		Cost of God	ods Sold	54 3
0	0.03	c)	80,000	f) 3	372,000		
		200					

Under JIT costing, no entries are made for transaction b, c, and e. Entry b is not necessary because the placement of materials into production is implied in transaction (a) when the materials are first received. No separate entry is made for (c) because direct labor is combined with factory overhead and maybe debited first to conversion cost or maybe debited direct to cost of goods sold.

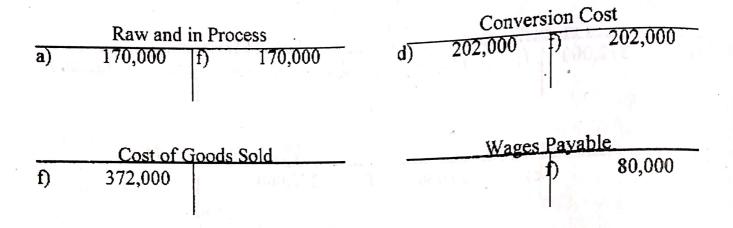
The JIT costing system would record the January transactions in the following manner.

A.	Raw and In Process Accounts Payable	abor and ever ead	170,000	170,000
C.	Conversion Cost Accrued Payroll	of galtelen stead	80,000	80,000
D.	Conversion Cost Miscellaneous Acc	counts	122,000	122,000

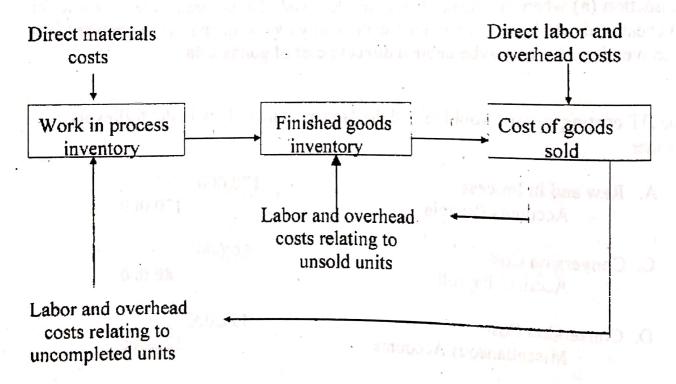
F. Cost of Goods Sold
Raw and In Process
Conversion Cost

372,000 170,000 202,000

The general ledger (T-accounts) will appear as follows:



#### SUMMARY OF COST FLOWS IN JIT COSTING



## ILLUSTRATIVE PROBLEM

Assume that Wilkins Company uses JIT costing for the production of goods during the month of January. The following transactions summarize the major steps in Wilkins' production during the month of January.

- 1. Raw materials received from suppliers amounted to P4,000.
- 2. Direct labor costs of P10,400 and overhead costs of P7,800 were incurred and applied, respectively, during the month of January.
- 3. The cost of work-in-process at January 31 was P3,600. This cost was determined through the production report and is composed of the following elements:

Direct materials P 1,500
Direct labor 1,200
Overhead 900

In addition, assume that finished goods inventory at January 31 was P6,500, consisting of:

Direct materials P 1,500
Direct labor 2,850
Overhead 2,150

The journal entries under JIT costing are shown below.

1.	Raw and in Process	4,000	
	Accounts Payable	pountificação es consti	4,000
	To record product co	sts	

2. Cost of goods sold	18,200
Wages payable	10,400
Factory Overhead Control	7,800
To record product costs	are, margrangawa ansa marasa. 11 Tili evic Usa - sebiara abaa a

3. Finished goods
Raw and in Process
2,500
2,500

To record transfer of cost of units completed

that abor	Materials received Less: Mat. In RIP	4,000 1,500 2,500	dentine Constant of the control of t	
10 NE 10	Amount to be backflushed	ii.	1,000	1,000
4. Cos	et of goods sold  Finished goods  To record transfer of units s		reje so Ladal da outer political	2. Day
dy Japan ya	Materials cost of units comp Less: Mat. in FG end Amount to be backflushed	2,500 1,500 1,000	drew to remain	
	w and in Process nished goods Cost of goods sold To adjust cost of goods sold	£ 16	2,100 5,000	7,100
18.59 Pa.51	For Raw and In Process:  Labor cost - raw and in proce Overhead - raw and in proce Total to be adjusted	ess	1,200 900 2,100	lo grica a Social
DRIV	For Finished goods  Labor cost - finished goods  Overhead - finished goods  Total to be adjusted	T obsting	2,850 2,150 5,000	rlsmall Ran

Backflushing

Backflushing is also known as backflush costing or backflush accounting. It is a shortened version of the traditional method of accounting for cost. Under job order costing and process costing numerous subsidiary records of the cost of the work in process are maintained and these records are updated by many accounting entries. Under JIT system, where the time from the receipt of the materials to the completion of product is reduced to a few hours, the usefulness of tracking the cost of the WIP becomes impractical

reaction of cost of units completed

alego topionia broson of

The purpose of backflush costing is to simplify and to reduce the number of events that are measured and recorded in the accounting system. If we compare it to job order costing and process costing, it will be noted that there is no detailed tracking of the cost of work in process. Under backflush costing the inventories are not adjusted during the accounting period to reflect the different production costs, instead adjustments are made at the end of the period. Detained subsidiary records are not maintained of units in process.

Backflush costing eliminates some of the accounting steps under traditional costing and some of the general ledger accounts are combined into one. Example will be the materials account and work in process account which are combined into one account - Raw and In Process. Raw materials received are put immediately into production so materials and work in process are combined in a single account.

Under job order costing and process costing, the cost of the completed units is determined by assigning the three elements of cost - direct materials, direct labor and factory overhead -to the work in process at various stages during production. Under backflush costing some or all elements of the cost of output are determined only after the production is completed.

being the later was and in some the employed with the rest and in

The second recorded bases of profits storm were derebuted abunesed and

hate Bund and court of the fighterial busy considered attacher where The and Area -

9. The time involved invehanging equipment and gamen jags por from

10. To a conflicte under all bas less responsability for quality gongrol

inan in a commentant production system.

in others to accoming date the production of a deflerent frein is divoyed

## TRUE OR FALSE

Automot me 2	the following statements, enter a T or and F I the blank to indicate statement is true or false.
1. 2.	One purpose of a JIT inventory system is to have goods ready just when the customer needs them.  Under JIT, materials are "pushed" from one workstation to another to ensure timely completion of finished products.  A company will typically have fewer suppliers under JIT than a
,	For JIT to operate successfully, all similar pieces of equipment (such as lathers or drill presses) must be grouped together.
5.	
6.	The most effective way to achieve total quality control is to have an Inspection Department that inspects all incoming raw materials, and inspects goods as they move along the product flow line.
7.	In a JIT environment, workers are expected to be cross-trained and work as a team.
8.	Under JIT, process time and queue time would both be considered value-added activities.
9.	The time involved in changing equipment and getting jigs and forms in place to accommodate the production of a different item is known as the setup time.
10	The workforce under JIT has less responsibility for quality control than in a conventional production system

## **Problems**

Problem 1

Stillwater Manufacturing has a cycle time of less than a day, uses a Raw and In process (RIP) account and expenses all conversion costs to Cost of Goods Sold. At the end of each month, all inventories are counted; their conversion cost components are estimated and inventory account balances are adjusted accordingly. Raw material is backflushed from RIP to Finished Goods. The following information is for the month of August.

RIP beginning, including P 25,560 of conversion cost	P	42,600
FG beginning, including P 27,000 of conversion cost		45,000
Raw materials purchased on credit		356,000
RIP end, including P 13,500 of conversion cost estimate		22,500
FG end, including P 9,600 of conversion cost estimate		16,000
Direct labor - P 350,000; factory overhead - P 196,150,000		

Required: Prepare all journal entries that involve the RIP account and/or finished goods account.

#### Problem 2

The Magnolia Corporation has a cycle time of 1.5 days, uses a raw and in process account, and charges all conversion costs to Cost of Goods Sold. At the end of each month, all inventories are counted, their conversion cost components are estimated, and inventory account balances are adjusted. Raw materials cost is backflushed from raw and in process account to finished goods. The following information is for July.

miorination to very	
Beginning balance of RIP account, including	22 400
P14.040 of conversion cost	23,400
Beginning balance of finished goods account,	24.000
including P14,400 of conversion cost	24,000
microuning 1 14,400 or condit	444,000
Raw materials received on credit	
Ending RIP inventory per physical count, including	25,600
P15 360 conversion cost estimate	23,000
Ending FG inventory per physical count, including	19,000
D11 400 services on cost estimate	
Conversion cost (direct labor – P210,000; factory overhead – P189,000)	

Required: Journal entries to record the given transactions

The Smart Manufacturing Company has a cycle time of 3.0 days, uses a Raw and In Process account and charges all conversion costs to Cost of Goods Sold. At the end of each month, all inventories are counted, their conversion cost components are estimated and inventory account balances are adjusted. Raw material cost is backflushed from RIP to Finished Goods. The following information is for the month of lune

nth of June.	140,000
Materials purchased on credit	15,000
RIP beginning, including P4,400 of conversion costs	36,000
FG beginning, including P10,800 of conversion costs	24,000
RIP end, including P 7,800 of conversion costs	18,000
FG end, including P 6,500 of conversion costs	is i
Conversion cost – P 80.000 direct labor and P100,000 overhead	

Requirements

1. Compute for the amount of materials backflushed from RIP to Finished Goods

2. Compute for amount of materials backflushed from Finished Goods to CofGS.

3. Journal entries to record the above transactions

#### **Problem 4**

The Chiz Manufacturing Company has a cycle time of 2.0 days, uses a Raw and In Process account (RIP) and charges all conversion cost to Cost of Goods Sold. At the end of each month, all inventories are counted, their conversion cost components are estimated and inventory account balances are adjusted. Raw materials cost is backflushed from RIP to Finished Goods. The following is for the month of May.

RIP beginning, including P12,000 of conversion cost	P 40,000
FG beginning, including P 8,800 of conversion cost	35,000
Raw materials purchased on credit	230,000
RIP end, including P 15,700 of conversion cost	28,500
FG end, including P 13,100 of conversion cost	19.800
Conversion cost - P 180 000 of direct labor and P 225 000	<b>用作80</b> 20 每15年 52 50 kg

Conversion cost - P 180,000 of direct labor and P 225,000 of overhead

Requirements:

1. Amount of materials backflushed from RIP to Finished Goods

2. Amount of materials backflushed from Finished Goods to Cost of Goods Sold.

Required: Journal entries to record die given transac

3. Journal entries to record the given transactions

## ACCOUNTING FOR MATERIALS

### LEARNING OBJECTIVES

Upon completion of this chapter, you should be able to:

• Distinguish between and account for direct and indirect materials as they are used in the production process.

• Differentiate among the forms used in the purchase and issuance of materials such as purchase requisition, a purchase order, a receiving report, and a materials requisition.

Distinguish between the periodic and perpetual cost accumulation systems
used to account for materials issued to production and for ending materials
inventory.

• Listinguish among the five common control procedures used to assist management is keeping inventory costs to a minimum.

# SYSTEMS OF ACCOUNTING FOR MATERIALS ISSUED TO PRODUCTION AND ENDING MATERIALS INVENTORY

Either the periodic inventory system or the perpetual inventory system may be used to account for materials issued to production and ending materials inventory.

## ACCOUNTING BY THE PERIODIC INVENTORY SYSTEM

Under a periodic inventory system, the purchase of direct and indirect materials is recorded in an account entitled "Purchases". If a beginning materials inventory exists, it is recorded in a separate account entitled "Materials Inventory – Beginning". Purchases added to the materials inventory – beginning will be equal to materials available for use. Ending materials inventory is determined by a physical count of the materials on hand at the end of the period. Cost of materials issued is determined by deducting from the materials available for use the materials inventory – end. Note that under this method the cost of materials issued is not directly determined; it is indirectly computed by deducting the remaining inventory on hand from the total available for use.

## ACCOUNTING BY THE PERPETURAL INVENTORY SYSTEM

Under a perpetual inventory system, the purchase of direct and indirect materials is recorded in an account entitled "Materials Inventory" rather than in a purchase

account. The beginning materials inventory is the balance of the materials inventory at the end of the previous period. When materials are issued, the Materials Inventory account is credited for the cost of direct materials with a corresponding debit to the account is credited for the cost of direct materials is debited to the factory work in process inventory. Issuance of indirect materials is debited to the cost of overhead control account. Under the perpetual inventory system, both the cost of materials issued and the ending materials inventory can be directly ascertained after each transaction.

#### **CONTROL PROCEDURES**

It is of utmost importance that a company has a good system of materials inventory control. Achievement of good control keeps costs at a minimum level and plant production on a smooth, uninterrupted schedule. The following concepts should be employed in an inventory control system.

1. Inventory is the result of purchasing raw materials and parts. It is also the result of applying labor and factory overhead to the raw materials to produce finished goods.

2. Reduction of inventory is the result of normal use and also finding alternative uses

for scrapping unneeded items.

3. Optimum inventory investment is based on quantitative techniques, which are designed to minimize the cost of carrying inventory and the cost of ordering inventory.

4. Efficient purchasing, management, and investment in materials depend on an

accurate forecast of sales and resulting production schedules.

5. Forecasts help determine when to order materials. Controlling inventory can be

accomplished by scheduling production.

6. Inventory control is more than maintaining inventory records. Control is exercised by people who are making personal judgments partially on the basis of past experiences but within the general framework of organizational objectives and policies to achieve them.

7. Methods of inventory will vary depending on the cost of the materials and their importance to the manufacturing procedure. Expensive materials and materials essential to production will tend to have their program for control reviewed more frequently despite the cost and effort of doing so by experienced personnel

The total cost of a finished product is composed of the amount spent for materials, direct labor and share in the factory overhead. It becomes necessary therefore to adopt a cost control system for each element. The major function, in general, of any cost control system is to keep expenditures within the limits provided

by a preconceived plan. The control should also encourage cost reductions by eliminating waste and operational inefficiencies. An effective system of cost control is designed to control the people responsible for the expenditures because people control costs, costs do not control themselves.

# COMMONLY USED CONTROL PROCEDURES.

- 1. Order cycling
- 2. Min-max method
- 3. Two-bin method
- 4. Automatic order system
- 5. ABC plan

Order cycling - method where materials on hand are reviewed on a regular or periodic cycle, like let's say every 30 days. The cycle length will differ according to the type of material being reviewed. Essential or important materials will have a shorter review cycle than less important items. At the time of the review, an order will be placed to bring the inventory to a desired level. A technique often used for small items is the 90-60-30 day method. When the inventory level drops to a 60-day supply, an order will be placed for a 30-day supply.

Min-max method – this method is based on the assumption that materials inventory have minimum and maximum levels. Once the specific minimum and maximum quantities are determined, the minimum quantity will represent the order point. When the inventory reaches the minimum level, an order is placed to increase the inventory to the maximum level Minimum quantities are usually determined to protect the company against stockout.

Two-bin method – this method is used for materials that are considered inexpensive and/or nonessential. The advantage of this method is that it is simple and requires only a minimum of clerical time. Under this materials are divided and placed into two separate bins. The quantity of materials that will be used between the time an order is received and the next order is placed will be on the first bin. The second bin will contain the quantity of materials that will be used between the ordering and delivery, plus additional units of safety stock. When the first bin is emptied, an order is placed. The contents of the second bin will be used until the receipt of the shipment.

Automatic order system – this method is used by most companies that are computerized. An order is automatically placed when the level of inventory reaches a predetermined order point quantity. Perpetual inventory record cards are maintained

which record purchases and issuance of the specific materials. When the inventory balance is equal to the predetermined order point quantity an order is placed. With the use of a computer, it is possible to periodically recompute the optimum investment in inventory and thus revise the quantity to be purchased.

ABC Plan – method used by companies with a large number of materials, each one having a different value. The materials control for a high-value item will naturally be different from the material control for a low-value item. The ABC plan is a systematic way of grouping materials into separate classification and determining the degree of control that each group requires. For an example, inexpensive or not critical materials may be accounted for by using the min-max method. For expensive and critical materials a more sophisticated method, such as the automatic order system, may be used.

# **MATERIAL CONTROL**

There are two basic aspects of materials control

- 1. Physical control or safeguarding materials
- 2. Control of the investment in materials

Physical Control of Materials

Every business requires a system of internal control that includes procedures for the safeguarding of assets. Inventories, just like cash and marketable securities, must be protected from unauthorized use or theft. Inventories usually represent a significant portion of a manufacturer's current assets and because of this, materials must be controlled from the time the order is placed with the vendor until they are shipped to customers in the finished form. In general, effective control of materials involves:

- 1. Limited access.
- 2. Segregation of duties.
- 3. Accuracy in recording.

Limited Access. Only authorized personnel should have access to materials storage area. All issuance of materials for use in production and release of finished goods for shipment should be properly documented and approved.

Segregation of Duties. The following functions should be segregated to minimize opportunities for misappropriation of inventories – purchasing, receiving, storage, use, and recording.

Accuracy in Recording. Inventory records should permit the determination of inventory quantities on hand upon request, and cost records should provide the data for the valuation of inventories for the preparation of financial statements.

Controlling the Investment in Materials.

One of the most important objectives of material control is maintaining the proper balance of materials on hand. An inventory of sufficient size and diversity for efficient operations must be maintained, but the size should not be excessive in relation to scheduled production needs. The planning and control of the materials inventory investment requires careful study of the following factors: usage of funds, costs of materials handling, storage, and insurance against fire, theft, or other casualty, loss from damage, deterioration, and obsolescence. These factors should be considered in determining (1) when orders should be placed, and (2) how many units should be ordered.

Order Point. A subsidiary ledger must be kept for each individual item of raw material used in the manufacturing process. This ledger will indicate the inventory on hand for each item. The point at which an item should be ordered, called the order point occurs when the predetermined minimum level of inventory on hand is reached. Calculation of the order point is based on the following data:

- 1. Usage the anticipated rate at which the materials will be used.
- 2. Lead time the estimated time interval between the placement of an order and receipt of the material.
- 3. Safety stock the estimated minimum level of inventory needed to protect against running out of stock.

Assume that the expected daily usage of an item of material is 100 units, the anticipated lead time is 4 days, and it is estimated that a safety stock of 800 units is needed. The following calculation shows that the order point is 1,200 units

100 units (daily usage) x 4 days (lead time)

Safety stock
Order point

400 units
800 units
1,200 units

Economic Order Quantity.- the purchase order which results in the minimum total inventory cost. In determining the quantity to be ordered, the cost of placing an order and the cost of carrying inventory must be considered.

# Factors to be considered in determining ordering costs:

- 1. Salaries and wages of employees engaged in purchasing, receiving, and inspecting materials.
- 2. Communication costs associated with ordering, such as telephone, postage, and forms of stationery.
- 3. Materials accounting and record keeping.

# Factors to be considered in determining carrying costs

- 1. Materials storage and handling costs.
- 2. Interest, insurance, and property taxes.
- 3. Loss due to theft, deterioration, or obsolescence.
- 4. Records and supplies associated with the carrying of inventories.

# METHODS OF COMPUTING ECONOMIC ORDER QUANTITY

1. TABULAR METHOD – Under this method, several purchase order quantity alternatives are listed in separate columns. Total inventory costs, showing both carrying and ordering costs are calculated for each alternative. The column with the lowest total amount of inventory cost will be the economic order quantity

The economic order quantity can also be determined by constructing a table as shown below:

		Total	TO DESCRIPTION OF THE PARTY OF	Total	Total order
Order ·	No. of	Order Cost	Average	Carrying	& carrying
Size	orders		Inventory	Cost	Cost
100	100	P 1,000	50	P 40	P 1,040
300	33	330	150	120	450
500	20	200	250	200	400
700	14	140	350	280	420
900	11	110	450	360	470

EOQ = 500 units (order size where total costs = 400)

Order size = number of units per order

No. of orders = 10,000/order size

Total order cost = No. of orders x P10 per order

Average Inventory = Order size / 2

Total carrying cost = average inventory x P0.80

Total order & carrying cost = Total. order cost + Total carrying cost

Total ordering costs and total carrying costs vary inversely. The greater the inventory on hand, the greater the total carrying costs but the lower the ordering costs. If a small inventory is on hand, total carrying costs will be lower but more orders will be placed, thus increasing the total ordering costs. It is the responsibility of management to find

the proper inventory policy that keeps the total inventory costs (total carrying costs + total ordering costs) to a minimum.

2. FORMULA METHOD - The formula method is easy to use and it produces an exact figures The formula that can be used is:

$$EOQ = \sqrt{\frac{2CN}{K}}$$

where:

EOQ = economic order quantity

C = cost of placing an order

N = number of units required annually

K = carrying cost per unit of inventory

## **ILLUSTRATIVE PROBLEM 1**

To illustrate the application of the formula, let us assume the following:

Number of units of materials required annually	10,000
Cost of placing an order	P 10.00
Annual carrying cost per unit of inventory	P 0.80

Using the EOQ formula:

EOQ = 
$$\frac{2 \text{ (cost of order) ( number of units required annually)}}{\text{ (carrying cost per unit)}}$$

$$= \frac{2(\text{P10) (10,000)}}{\text{P0.80}}$$

$$= \frac{\text{P200,000}}{\text{P0.80}}$$

$$= \frac{250,000}{\text{P0.80}}$$

$$= \frac{250,000}{\text{P0.80}}$$

**Order Point** 

Once the Economic Order Quantity has been determined, management must decide when to place the order, the order point must be established. If the lead time and the inventory usage rate are known, determination of the order point is easy. Lead time is the period between the placement of the order and the receipt of the materials ordered. Inventory usage rate is the quantity of materials used in production over a period of time. The order point should be where the inventory level reaches the number of units that would be consumed during the lead time

**ILLUSTRATIVE PROBLEM 2** 

Assume that the expected daily usage of an item of material is 100 units and the anticipated lead time is 4 days. The following calculation shows that the order point is 400 units.

Order point = 100 units (daily usage) x 4 days (lead time) = 400 units

When the inventory level of materials is reduced to 400 units, an order should be placed for 500 units (the EOQ)

Safety Stock

Since it is almost impossible to estimate lead time and average usage rate with accuracy, many companies prefer to carry a safety stock (or additional inventory) as a cushion against possible stockouts. In such a case, the order point is computed by adding the safety stock to the estimate usage during the lead time. A safety stock calculation should arrive at a figure which properly balances the risk of a stockout against the additional carrying costs incurred by the extra inventory.

## **ILLUSTRATIVE PROBLEM 3**

Assume the use of same data as in the computation of the order point above (without the safety stock), the revised order point may be computed as follows assuming safety stock of 800 units:

100 units (daily usage) x 4 days (lead time)

Safety stock

Revised order point

400 units

800 units

1,200 units

# ILLUSTRATIVE PROBLEM 4

A television manufacturer buys wooden cabinet from outside suppliers at P 400 per set Total annual needs are 5,000 units at a rate of 20 sets per working day. The following cost data are available

Desired annual return on inventory investment (10% x 400)	P	40
Rent, insurance, taxes per unit per year	ha aras	10
Carrying costs per unit per year	P	50

Costs per purchase order - clerical costs, supplies, telephones, etc. P 50

Requirements:

- 1. What is the economic order quantity?
- 2. Compute for
  - a. Annual ordering costs
  - b. Annual carrying costs

# SOLUTION TO ILLUSTRATIVE PROBLEM 4

1. EOQ = 
$$\frac{2 \text{ (cost of order) ( number of units required annually)}}{\text{ (carrying cost per unit)}}$$

$$= \frac{23P50)(5,000)}{50}$$

$$= \frac{P500,00}{P50}$$

$$= 100 \text{ units}$$

2. a) Annual ordering cost -= 
$$\frac{5,000}{100}$$
 x 5 = P 2,500

b) Annual carrying cost = 
$$\frac{100}{2}$$
 x 50 = 2500

#### MATERIAL SUPPORT **BUSINESS PAPERS** USED TO TRANSACTIONS

1. PURCHASE REQUISITION - is a written request, usually sent to inform the purchasing department of a need for materials or supplies. The purchase requisition is usually preprinted according to the specifications of a particular company. Most forms usually include the requisition (serially numbered) name of the department or individual making the request, quantity of items requested, description of the item, unit price, order data, required delivery date, and authorized signature.

## FIGURE 7-1 **PURCHASE REQUISTION**

# NORTHERN CONSOLIDATED COMPANY PURCHASE REQUISITION

Department or individual making the request Forming Department

ORDER DATE 1/1/19 DELIVERY DATE REQUESTED 1/13/19

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
600 UNITS	Material A	P 5.50	P 3,300

TOTAL COST P 3,300

APPROVED BY

Using the Illustrative problem of chapter 4, the Forming Department requisitioned 600 units of Materials . Two copies of the purchase requisition are customarily made, the original oing to the purchasing department (to place the order) and the copy remained with the storeroom clerk who requested the purchase order (to keep track o'orders placed)

PURCHASE ORDER - is a written request to a supplier for specified goods at 2. an agreed upon price. The request also stipulates terms of delivery and terms of payment. The purchase order is the supplier's authorization to deliver goods and submit a bill. All items purchased by a company should be accompanied by purchase orders, which are serially numbered to provide control over their The following items commonly included in a purchase order are preprinted name and address of company placing the order, purchase order number, name and address of supplier, order date, date delivery is requested, delivery and payment terms, quantity of items ordered, description, unit and total price, shipping, handling, insurance and related costs, total cost of entire order, and authorized signature. If the purchase requisition is properly completed, the purchasing department will issue a purchase order ( in this case, for 600 units of Material A). Figure 6-2 below shows a purchase order. The original is sent to the supplier (to place the order) copies usually go to the accounting department (for future recognition in the purchases journal and the general and subsidiary ledgers), to accounts payable, (for eventual payment within the discount period), to the receiving department (to alert them to expect a delivery), and a copy is kept by the purchasing department (to maintain a file of all purchase orders issued)

# FIGURE 7-2 PURCHASE ORDER

# NORTHERN CONSOLIDATED COMPANY NOVALICHES, QUEZON CITY

SUPPLIER <u>Ellery Company</u> Cubao, O. C. ORDER DATE <u>1/02/19</u> DATE REQUESTED BY <u>1/03/19</u>

DELIVERY TERMS FOB Destination PAYMENT TERMS N/30

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
600	Material A	P 5.50	P 3,300
en en la companya de la companya de La companya de la co	on the majore because of	( nga sagangangan <mark>nganak kasalini</mark>	is entre province aring a balis - Li

TOTAL COST P 3.300

APPROVED BY \_

3.RECEIVING REPORT – When the goods that were ordered are delivered, the receiving department will unpack and count them. It is interesting to note that the quantity ordered is not shown on the copy of the purchase order sent to the receiving department. This deliberate omission ensures that the goods delivered are actually counted. The goods are checked to be sure that they are not damaged and that they meet the specifications of the purchase order. This form includes the that they meet the specifications of the purchase order. This form includes the supplier's name, purchase order number, date delivery was received, quantity supplier's name, purchase order number, date delivery was received, of mention of received, description of goods, discrepancies from the purchase order (or mention of damaged goods, and authorized signature

# FIGURE 7 – 3 RECEIVING REPORT

NORTHERN CONSOLIDATED COMPANY NOVALICHES, QUEZON CITY

SUPPLIER Ellery Company

PURCHASE ORDER NO. <u>015</u>

DATE RECEIVED 1/03/19

QUANTITY	DESCRIPTION	DISCREPANCIES
600	Material A	none
		ALL REPORTED BY A SERVICE OF SERVICE S

The original copy of the receiving report is kept by the receiving department. Copies are sent to the purchasing department (to indicate the order was received) and to the accounts payable department (to be matched against the purchase order and the supplier's bill). If all three agree, payment is authorized. Copies are also sent to the accounting department (to journalize and post the purchase and the related liability) and to the storeroom clerk who originated the purchase requisition (to give notice that the goods have arrived). A copy also accompanies the materials to the storeroom.

4. MATERIALS REQUISITION SLIP - a written order to the storekeeper to deliver materials or supplies to the place designated or to issue the materials to the person presenting a properly executed requisition. Each material requisition form shows the job number or department requesting the goods, their quantity and description, and the unit cost and total cost of the goods issued. The cost that is entered on the materials requisition is the amount charged to production for materials consumed.

# FIGURE 7 – 4 MATERIALS REQUISITION FORM

The first to the te	MATERIAL R	EQUISTION	N FORM	
OATE REQUIS	ITIONED _ <u>1/05/1</u>	<u>19</u>	DATE ISSU	ED <u>1/06/19</u> .
DEPARTMENT	REQUISTIONIN	ig <i><u>Formin</u></i>	G APPROVI	ED BY
REQUISITION	NO. <u>05</u>		ISSUED	BY
QUANTITY	DESCRIPTION	JOB NO	UNIT COST	TOTAL
200 400 200	Material A Material A Material A	101 102 102	P 5.00 5.00 5.50	P 1,000 2,000 1,100
			TOTAL	P 4,100

METHODS OF COSTING MATERIALS

The main objective of cost accounting is to produce accurate and meaningful figures for the goods manufactured and sold which are to be used by management for control, analysis and for the determination of the of the operating income. The more common methods of costing materials issued and finished goods sold are:

- 1. First-in, first-out (fifo)
- 2. Average cost

These methods are related to the flow of costs and not necessarily to the actual flow of materials or finished goods. If only the materials were acquired at the same cost all year round, then valuation of materials inventory, end, will not be a problem because the value can be computed by simply multiplying the units on hand and the unit cost. The same can be said for the finished goods because if the units were produced at the same cost all year round, the value at the end of the period can be computed by same cost all year round, the value at the end of the period can be computed by multiplying the finished goods on hand by the cost to produce each unit. The different multiplying the finished goods on hand by the cost to produce each unit. The different methods are used because the materials are acquired at different costs during the year. Average cost for perpetual inventory system refers to moving average and for periodic inventory system - weighted average.

# FIRST-IN, FIRST-OUT (FIFO) METHOD OF COSTING

The first-in, first-out (FIFO) method is based on the assumption that cost should be charged to manufacturing cost or cost of goods sold in the order in which incurred. Inventories are stated in terms of the most recent costs and expense is charged with the earliest costs incurred.

#### **ILLUSTRATIVE PROBLEM 5**

August 1	Inventory 400 units at P10	P	4,000
12	Purchase 600 units at P12		7,200
16	Issue 500 units		Carlo Hand
18	Purchase 300 units at P15		4,500
20	Issue 200 units		
25	Purchase 400 units at P14		5,600
28	Issue 400 units		55.44 M

The inventory on August 31 shows 600 units on hand. Under periodic inventory system, the most recent costs would be assigned to the units as follows:

From Aug. 2	25 purchase 400 units at	P 5,600
. From Aug. 1	8 purchase 200 units at	$\frac{15}{3,000}$
Total	600	
	The state of the s	P 8.600

If the ending inventory is valued at P8,600, cost of materials issued is P12,700 computed as follows:

Materials, Aug. 1		the distribute party and the second
Purchases $(7,200 + 4)$	1.500 + 5.600	P 4,000
Total available for us		<u>17,300</u>
Less: Materials, Au		21,300
Direct materials used	<b>-</b>	_8,600
		P12,700

When perpetual inventory system is used, a stock card is used to record the costs assigned to units issued and to cost relating to the units on hand.

DATE	RECEIVED	ISSUED		BALA	NCE
8/1	to the letter	minu a ties s		400 at P10.00	P4,000
12	600 at P12.00		10 11	400 at 10.00	4,000
	THIS I			600 at 12.00	7,200
16	008 6	400 at 10.00	Ar A	in sina 900	
	1002	100 at 12.00		500 at 12.00	6,000
18	300 at P15.00			500 at 12.00	6,000
	4			300 at 15.00	4,500
20		200 at 12.00	12102	300 at 12.00	3,600
4		9300, 1		300 at 15.00	4,500
25	400 at P14.00	202 May 14		300 at 12.00	3,600
	Commence and Late 196		4. 170	300 at 15.00	4,500
				400 at 14.00	5,600
28	s ai metrya groussyri. ba	300 at 12.00		200 at 15.00	3,000
ren a arve.	an er manske knamentelski Spiriter	100 at 15.00		400 at 14.00	5,600

As shown on the issued section of the stock card-above, the cost of materials issued is:

400 at P	10.00	P 4,000
100 at		1,200
200 at	12.00	2,400
300 at		3,600
100 at		1,500
1 100	357151 . (19.41 3 09.	P 12,700
	10(1,1	TO THE PART OF THE

The value of the units on hand, August 31 using perpetual inventory system is the same as that computed under period inventory system. The amount is computed as follows:

200 at P	15.00			P	3,000
400 at	14.00				5,600
600	r'iri q	1 14	mod fiftu	<u>P</u>	8,600

05.119

## **AVERAGE METHOD**

a. Weighted average method - used for periodic inventory system. This method is based on the assumption that units issued should be charged at an average cost, such average being influenced or weighted by the number of units acquired at each price. The inventory at the end is computed by multiplying the weighted average cost per unit by the units on hand. Using the illustrative problem on page 186, the weighted average unit cost is computed as follows:

	400 units at P	10.00		P	4,000
	600 units at				7,200
	300 units at	15.00	BO OL WOLL		4,500
	<b>400</b> units at	14.00	90 Ct to COT		5,600
(b.s.)	1,700	17-97-90-7-20-04-04	And the state of the last of the	$\overline{P}$	21,300

Weighted averaged unit cost = 
$$\frac{21,300}{1,700}$$

b. Moving average method - when a perpetual inventory system is used, a new weighted average unit cost is calculated after each new purchase, and this amount is used to cost each subsequent issuance until another purchase is made.

DATE	RECEIVED	ISSUED	BALANCE
<b>8</b> /1			400 at P10.00 P 4,000
12	600 at P12.00		1,000 at 11.20 11,200
16		500 at P11.20	500 at 11.20 5,600
18	300 at 15.00		800 at 12.625 10,100
20	A second	200 at 12.625	600 at 12.635 7,575
25	400 at 14.00		1 000
28	and the second s	400 at 13.175	(00
			600 at 13.175 7,905

The computation of the unit cost is as follows:

Aug. 12 Balance 400 at P10.00 P 4,000 600 at 12.00 Purchase 7,200 1.000 11,200 The new weighted average unit cost

$$= \frac{P \ 11,200}{1,000 \ \text{units}}$$

Aug. 18  Balance 500 at P11.20  Purchase 300 at 15.00  800	<u>4,500</u> hereal has been selected and add
The new weighted average unit cost =	P 10,100 800 units

The cost of materials issued may be computed from the data presented under issued section.

	500 units at P	11.20	P	5,600	
Addition	200 units at	12.625		2,725	1
habited to both	400 units at	13.175	rent in	5,270	
inized when	100	e zamici Militaria Angli Magilian Ger	P	13,395	
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	because an area discovered beared	Rat at 1	NEED HOUSE AND A STATE	

# COMPARISON - FIFO AND AVERAGE METHODS

although a ca passante a jo col-	<u>FIFO</u>	AVERAGE
Inventory	P 4,000	P 4,000
Purchases	17 700	17,300
Total available for use	21,300	
Less: Inventory, Aug. 31	8,600	7,905
Direct materials used	P12,700	<u>P13,395</u>

# SPECIAL PROBLEMS IN MATERIAL ACCOUNTING

- **DISCOUNTS** constitute a reduction in the list price. 1.
  - Trade discounts generally given in terms of percentage (15%, 10%, 5%) and are used to convert single price list into a series of price lists for different types of middleman. Trade discounts are not recorded on the books because purchases are recorded on the books net of the discount.

ILLUSTRATIVE PROBLEM 6
Windy Corporation buys all of it materials and supplies from the Oregon Company and is allowed a trade discount of 10%. Purchases during the month were P400,000 before the discount.

The entry to record the purchase is:

Materials

Accounts Payable

(400,000 x 90%)

P 360,000 P 360,000

- 2) Quantity discounts represent cost savings for volume purchases. Like trade discounts, quantity discounts are not given explicit accounting recognition in the books.
- 3) Cash discounts granted to customers to motivate them to pay promptly.
  - a) When taken method purchases and liabilities are recorded at gross amounts at the time of purchase. The discount is only recognized when the account is paid within the discount period.
  - b) When not taken method purchases and liabilities are recorded at net at the time of purchase; when payment is made after the lapse of the discount period, the discount not availed of is charged to a "Purchase Discount Lost" account. It is called when not taken method because even if the account is paid within the discount period, no "Purchase Discount" is recorded and therefore readers of the financial statements would not know that the company has availed of the discount.
  - c) When offered method purchases are recorded at net and the liability is recorded at gross, the difference is charged to an "Allowance for Purchase Discount" account. When payment is made after the lapse of the discount period, the discount not availed of is charged to the "Purchase Discount Lost" account.

COUNTS - constitute a recognion to decline once.

Frade discounts - dependity given a terras of percentage (15%, 16%, 5%) and are used to convert single, price list into a series of price lists for different opers of middleman. Trade discounts are not reported on the books because parchases and recorded on the books action the discount.

# ILLUSTRATIVE PROBLEM 7

Accounts Parable The Jenelle Company purchased materials listed at P40,000; terms, 2/15, n/30 on August 1.

Assume payments as follows:

- a) Full payment is made on August 14.
- b) Full payment is made on August 30.

Requirements: Entries to record the purchase and payments assuming:

added to the inverce gates. The secoust debical

- 1) When taken method is used.
- 2) When not taken method is used.
- When offered method is used and travel and a performance of the perfor

# 1) When taken method is used:

Aug. 1	Materials	40,000	ला पुरावेश की है।
	Accounts Payable	Angelogie	40,000
asis of the peed	or the hearth and aligned		PARTITION OF THE
ban bearing 4	Accounts Payable	40,000	33: Voleton
	Purchase Discount	William Japan Feb.	800
	Cash		39,200
to Majow one to	at in Amountal on the basis	and or physical ide	(2 P 10 10 P 10 A A A
30	Accounts Payable	40,000	
	Cash		40,000

#### of electrone with to a customer set income and the common terminal contract and a comment of the common termina 2) When not taken method is used:

pective

acain Conse	Materials Accounts Payable	39,200	39,200
ado situari) peza odal 431	Accounts Payable Cash	39,200	JAN 107
30	Accounts Payable Purchase Discount Lost Cash	39,200 maio pano 1800 bentoni ambana	

# 3) When offered method is used:

Aug. 1	Materials	39,200	-ala C
Rug. I	Allow for Purchase Discount	800	Alaba SI
	Accounts Payable	Thousan 1998 Salvins	40,000

14	Accounts Payable Allow. For Purchase Dis Cash	40,000 count	800 39,200
30	Accounts Payable Purchase Discount Lost	40,000 800	800
•	Allow. for Purchase Disc	count	40,000

# II. FREIGHT-IN

- 1. Direct charging the freight incurred on the purchase of raw materials is added to the invoice price. The account debited for the freight is Materials. The effect is an increase in the unit cost. If two or more materials are purchased and delivered at the same time, the freight must be allocated using the following methods:
  - a. Relative peso value method freight is allocated on the basis of the peso value of the items purchased. This is used for materials purchased and expressed in different terms of measurement.
  - b. Relative weight method freight is allocated on the basis of the weight of the items purchased.
- 2. Indirect charging the freight incurred on the purchase of raw materials is charged to Factory Overhead Control account.

#### **ILLUSTRATIVE PROBLEM 8**

An invoice for raw materials A, B, and C is received from the Bulacan Corporation. The invoice totals are: A - P25,000; B - P15,000; C - P10,000. The freight charge on this shipment weighing 10,000 pounds is P1,500. Shipping weights for the respective materials are 5,000, 2,000, and 1,000, respectively.

#### Required:

- 1. Entry to record the purchase of materials and the freight using:
  - a. Direct charging method.
  - b. Indirect charging method.
- 2. The cost per pound to be entered in the materials ledger cards for A, B, and C, if freight is allocated using:
  - a. Relative peso value method.
  - b. Relative weight method.

# 1. a) Direct charging method:

Materials	51,500
Accounts Payable	51,500

# b) Indirect charging method:

Materials	50,000
Factory Overhead Control  Accounts Payable	1,500
that while is not maked on hour	usken over all production and for far

# 2, a) Relative peso value method:

bick into	Mat.	<u>Invoice</u>	Percentage	Share in freight	Total <u>Cost</u>	Cost per Pound
10- Decition	1. 计图题	ten of the cold	學事 次 學時点	域 法统约证据	र्वाक्षा, कर्त करिय	de la companya de la
	A	25,000	3%	750	25,750	5.15
	$\mathbf{B}$	15,000	3%	450	15,450	7.725
10 5 W 150	$m_{\mathbf{C}}\mathbf{C}_{\mathbf{d}}$	10,000	3%	300	10.300	10.30
		50,000	Supplied the state of	1,500	51,500	alera or
	2.17.1	Percentage =	= 1,500	= 3%		CONTRACTOR
	Most	n saare sir	50.000	arbasi Lahi		

# Relative weight method as bosses and the observe of the buggest?

My to tent

al consideration and a second and the season of the second	each rough the first		
Weight Freight per  Mat. (pounds) Pound	Share in freight	Total Cost	Cost per Pound
A 5,000 0.1875 B 2,000 0.1875 C 1,000 0.1875	937.50 375.00 187.50 .500.00	25,937.50 15,375.00 10,187.50 51,500.00	7.5.1875 7.6875 10.1875
Freight per pound	$\frac{1,500}{8,000} =$	0.1875	

# SPOILED UNITS, DEFECTIVE UNITS, SCRAP MATERIAL, AND WASTE MATERIAL IN A JOB ORDER COST SYSTEM

The terms spoiled units, defective, scrap material and waste material are not synonymous, and they should not be used interchangeably. For this discussion, the following definitions will apply.

Spoiled units are units that do not meet production standards and are either sold for their salvage value or discarded. When spoiled units are discovered, they are taken out of production and no further work is performed on them.

<u>Defective units</u> are units that do not meet production standards and must be processed further in order to be salable as good units or as irregulars.

Scrap material are left over from the production process that cannot be put back into production for the same purpose, but may be usable for a different purpose or production process or which may be sold to outsiders for a nominal amount.

Waste materials are left over from the production process that has no further use or resale value and may require cost for their disposal.

## TWO METHODS OF ACCOUNTING FOR SPOILED MATERIALS

The method to account for spoiled materials depends on the reason for such spoilage.

1. Charged to the specific job - this method is used if the reason for the spoilage is the job itself, because it requires exacting specifications, or a difficult, intricate or complicated manufacturing process. The effect of this method is that it will increase the unit cost of the remaining perfect finished articles in the job.

Entry: Spoiled goods
Work in process

nad a

The amount debited to spoiled goods and credited to work in process is equal to the number of units spoiled multiplied by the estimated sales value per unit.

2. Charged to all production - this method is used if the reason for the spoilage is considered normal to the process and the number does not exceed the limit set by the company. With this method, all units manufactured during the period are charged with an additional cost which is added to the factory overhead rate. The unit cost originally charged will not increase anymore even if there are spoiled units discovered later on.

Entry:

Spoiled goods

xxx

Factory overhead control

xxx

Work in process

xxx

The amount debited to spoiled goods is equal to the number of units spoiled multiplied by the estimated sales value per unit. The amount credited to work in process is equal to the total costs incurred/charged to the spoiled units. The loss is charged to factory overhead control.

If the number of units spoiled exceed the limit set by the company, or if the reason is not considered normal to the process, the loss on the spoiled units is charged to a loss account.

## **IILLUSTRATIVE PROBLEM 9**

Job 3044 called for the making of 4,000 with these unit costs:

Direct materials		Р	15.00
Direct labor			13.00
Factory overhead (i	ncludes a P1.00		
allowance for	spoiled work)	14 %	12.00
Total	(0) (1) ( (HC) (1)	<u>P</u>	40.00

When the order was completed, 200 rejected units, a normal number, were sold for P18.00 each.

# Required:

- 1. Entries if the loss is charged to all production.
- 2. Entries if the loss is charged to the specific job.

Under the method, loss diarged to all production, the unit cost of the completed units remains at FRO.00. In spite of the spoiled units, the unit rost.

Loss is charged to all product a) Work in Process		160,000	60.00
Materials	See This Part of the Mile	LOWING ITS ALL	60,00
Payroll	continue during the bally		52,00
Factory Overhead	d Annlied	an and but it	48,00
Materials=	4,000 x 15.00		
Labor =	4,000 x 13.00	war midd	
Overhead=	4,000 x 12.00		
Overnead-	4,000 A 12.00		i dipat
b) Spoiled Goods	The property of the second	3,600	
Factory Overhead Con	utual	4,400	Jones in
Work in Process			8,00
Spoiled =	200 x 18.00	Particular and the second	
WP =	200 x 40.00	tory overhead o	gegasar sin sin sin si Lugan perak
•	13,011	of Mineral Control of the Control of	
Work in Process	orders, the loss on the	152,000	152,00
Work in Process  Loss is charged to the specif	de no enclado, resubec		152,00
Loss is charged to the specif	de no enclado, resubec	EOSA MALLA Francia de la constanta	152,00
Loss is charged to the specifical work in Process	de no enclado, resubec		152,00
Loss is charged to the specifical  a) Work in Process  Materials	de no enclado, resubec	EOSA MALLA Francia de la constanta	60,00
Loss is charged to the specif a) Work in Process Materials Payroll	fic job.	EOSA MALLA Francia de la constanta	60,00 52,00
Loss is charged to the specifical  a) Work in Process  Materials  Payroll  Factory Overhead	fic job.	EOSA MALLA Francia de la constanta	60,00 52,00
Loss is charged to the specifical  a) Work in Process  Materials  Payroll  Factory Overhead	fic job.  d Applied 4,000 x 15.00	EOSA MALLA Francia de la constanta	60,00 52,00
Loss is charged to the specifical work in Process  Materials  Payroll  Factory Overhead  Materials =  Labor =	fic job.  d Applied 4,000 x 15.00 4,000 x 13.00	EOSA MALLA Francia de la constanta	60,00 52,00
a) Work in Process  Materials  Payroll  Factory Overhead  Materials =  Labor =  Overhead=	fic job.  d Applied 4,000 x 15.00 4,000 x 13.00 4,000 x 11.00	EOSA MALLA Francia de la constanta	60,00 52,00
a) Work in Process  Materials  Payroll  Factory Overhead  Materials =  Labor =  Overhead =	fic job.  d Applied 4,000 x 15.00 4,000 x 13.00	156,000 and the sound of the so	60,00 52,00
a) Work in Process Materials Payroll Factory Overhead Materials = Labor = Overhead=	fic job.  d Applied 4,000 x 15.00 4,000 x 13.00 4,000 x 11.00	EOSA MALLA Francia de la constanta	60,00 52,00 44,00
a) Work in Process  Materials  Payroll  Factory Overhead  Materials =  Labor =  Overhead =	fic job.  d Applied 4,000 x 15.00 4,000 x 13.00 4,000 x 11.00	156,000 and the sound of the so	60,00 52,00
a) Work in Process  Materials Payroll Factory Overhead Materials = Labor = Overhead =  b) Spoiled Goods Work in Process	fic job.  d Applied 4,000 x 15.00 4,000 x 13.00 4,000 x 11.00	156,000	60,00 52,00 44,00
a) Work in Process  Materials Payroll Factory Overhead Materials = Labor = Overhead =  b) Spoiled Goods Work in Process  c) Finished Goods	fic job.  d Applied 4,000 x 15.00 4,000 x 13.00 4,000 x 11.00	156,000 3,600	60,00 52,00 44,00

Under the method, loss charged to all production, the unit cost of the completed units remains at P40.00. In spite of the spoiled units, the unit cost

remained the same because the increase was made at the start (when P1.00 was added to the factory overhead rate as allowance for spoiled work). All units processed during the period, even those jobs without spoiled units, will absorb the additional p1.00. Upon completion of the job, even if there were spoiled units, the unit cost will be the same as the amount originally charged to the job.

On the other hand under the method, loss charged to the specific job, it will be noted that the factory overhead rate was recorded at the original amount P11.00 (allowance of P1.00 for spoiled work was not added). The remaining perfect units in the job will absorb the loss on the spoiled, resulting in an increase in the unit cost

 $(\frac{152,400}{3,800 \text{ units}} = 40.105/\text{unit})$ 

the increase in the unit cost (40.105 - 39.00 = 1.105) may be computed as follows:

Cost of spoiled (200 x 39.00)

Less: Amount recovered from sale (200 x 18)

Loss on spoiled goods

7,800

3,600

4,200

The loss on spoiled goods will be absorbed by the remaining good units (4,200 divided by 3,800 units = 1.105/unit).

# TWO METHODS OF ACCOUNTING FOR DEFECTIVE MATERIALS

The accounting problem for defective units is the additional costs to be incurred in reprocessing the units to convert them into perfect articles. There are two methods available:

1. Charged to the specific job - same for spoiled units, if the reason for the defect is the job itself, the additional costs incurred (materials, labor, and overhead) will be charged to all units in the job.

Entry: Work in process xxx

Materials xxx

Payroll
Factory Overhead Applied xxx

Fine cost of the finished goods will remain at the original amount charged to the job

2. Charged to all production - if the reason is normal to the process and the number of defective units do not exceed the normal limit, then the additional costs incurred will be charged to all units being processed during the period.

Entry:	Factory overhead control	XXX	XXX
	Materials		XXX
in ad illi	Payroll  Factory overhead applied	Loston sift	XXX

**ILLUSTRATIVE PROBLEM 10** 

Job 3044 called for the making of 4,000 units with these unit costs:

Direct materials	P	15.00
		13.00
Direct labor		
Factory overhead (includes a P1.00		12.00
allowance for defective units)	1	
Total	<u>P</u>	40.00

During processing 300 units were found to be defective and required the following total additional costs: materials - P2,000; labor - P4,000; and overhead - P2,000.

Required:

- 1. Entries if the additional cost is charged to all production
- 2. Entries if the additional cost is charged to the specific job.

1. Additional cost is charged to all production.

a)	Work in Process	160,000
July 1	Materials	60,000
Pan a	1 ayron	52,000
	Factory Overhead Applied	48,000
b)	Factory Overhead Control	8,000 beared
	Materials	2,000
	Payroll	dug arismi estat. Ha 4,000
	Factory Overhead Applied	2,000
c)	Finished goods	160,000
	Work in Process	160,000

The cost of the finished goods will remain at the original amount charged to the job (160,000 divided by 4,000 units = P40.00)

# 2. Additional cost is charged to the specific job.

a)	Work in Process Materials. Payroll Factory Overhead Applied	156,000	60,000 52,000 44,000
b)	Work in Process	8,000	grane a sali
والموجال	Materials		2,000
	Payroll	• •	4,000
THE	Factory Overhead Applied	State School to be described.	2,000
	Fig. 1-1 - 1 Co 1	1 1 1 1 2 2 30 0 4 1 1 1 1 1 2 2 3 3 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4	
c)	Finished Goods	164,000	
44	Work in Process		164,000

The unit cost of the completed units increased from the original P39.00 to P41.00 (164,000 divided by 4,000 units). All units in the job will share in the cost incurred to re-process the defective units.

ACCOUNTING FOR SCRAP MATERIAL

A cost accounting system should provide a method of costing and control for scrap as it does for spoilage and defective units. When the amount of scrap produced exceeds the norm, it could be an indication of inefficiency. A predetermined rate for scrap should be prepared as a guide for comparison with the actual scrap those results. If large differences occur, management should find the reason and correct the problem. Scrap materials have commonly been accounted for in either of the following ways.

1. If the scrap recovered can be traced to a specific job, the entry is

Scrap/Scrap Materials
Work in Process

xxx

XXX

The amount recovered for the scrap will be entered negative () on the materials section of the job order cost sheet.

2. If the scrap recovered are not traceable to a specific job, the entry is:
Scrap/Scrap Materials

Miscellaneous Income

XXX

3. If the scrap recovered are from factory supplies, the entry is: XXX Scrap/Scrap Materials Factory overhead control

**ACCOUNTING FOR WASTE MATERIAL** The cost of disposing of waste materials may be allocated either to all jobs (included in the form in the factory overhead application rate) or to specific jobs (not included in the factory overhead application rate).

1. If the cost of disposing the waste materials is allocated to all jobs, the entry is Factory overhead control XXXXXX Accounts payable

2. If the cost of disposing the waste materials is allocated to a specific job, the entry

Work in process inventory – (Job number) Accounts payable

Waste exceeding a specified normal level (based on past experience) indicates inefficiencies somewhere in the production process and signals management to take corrective action.

Although the cost of disposing of waste materials is minimal as compared to the total production costs, in some manufacturing and service corporations it may involve significant expenditure. For example, a chemical manufacturer may have toxic waste which requires special packaging before disposal and thus results in an expensive disposal cost.

The cost of disposing of most type of waste is expected to increase significantly in the near future as existing garbage dumps fill up and more elaborate and expensive forms of disposal must be developed.

# ACCOUNTING FOR BASIC MATERIAL TRANSACTION

TRANSACTION	BUSINESS PAPER	ENTRY	SUBSIDIARY RECORDS
Purchases of Materials in	Voucher supported by invoice; receiving	Dr. Materials Cr. Accounts	Received section of
Advance of use	report and purchase order (PO)	Payable	stock card
Emergency Purchases of	Voucher supported	Dr. WP	Material section
Direct material	by invoice; receiving report and purchase order	Cr. Accounts Payable	of cost sheet
Emergency Purchases of Ind. Materials	Voucher supported by invoice; receiving report and purchase order	Dr. FOC Cr. Accounts Payable	Factory OH Ledger
Return of Materials and Supplies to vendor	Return shipping order with debit memo	Dr. Accounts Payable Cr. Materials	Received section of stock card ()
Issue of Direct materials	Materials Requisition	Dr. WP Cr. Materials	Mat. section cost sheet. Issued section of stock card
Issue of indirect Mat. & supplies	Materials requisition	Dr. FOC Cr. Materials	OH ledger Issued section stock card
Return of excess Materials from Factory	Returned materials report	Dr. Materials Cr. WP	Issued section of stock card () Mat. cost sheet

## **QUESTIONS**

- 1. What are the major objectives of materials control?
- 2. What factors should management consider in determining the amount of investment in materials?
- 3. What is the meaning of "order point"?
- 4. What kind of information and data are needed to calculate an order point?
- 5. Normally, a manufacturer maintains an accounting system which includes a stores ledger and a general ledger account for Materials. Describe the relationship between the stores ledger and the materials ledger.
- 6. A company may select an inventory costing method from a number of commonly used procedures. Briefly describe each of the following methods
  - a. First-in, first-out
  - b. Moving average
- 7. What different methods that can be used to account for the sales value of the scrap materials?
- 8. What distinguishes a product as being spoiled or defective?
- 9. What are the different methods of accounting for spoiled units?
- 10. What are the different methods of accounting for defective units?

# **PROBLEMS**

## Problem 1

The Norman Company predicts that 64,000 units of material will be used during the year. The materials are expected to cost P20.00 per unit. It is anticipated that it will cost P 40.00 to place each order. The annual carrying cost is P 2.00.

- a. The most economical order quantity
- b. The total cost of ordering and carrying at the EOQ point

#### Problem 2

Abner Company has an annual demand of 13,000 units of Material A. The cost per unit is P14. The order cost is P200 per order; and the annual inventory carrying cost per unit is P5.20. Assume that the units will be required evenly throughout the year. Required: Compute for the following:

- a. Economic order quantity
- b. Number of orders in a year.
- c. Average inventory based on economic order quantity.
- d. Total carrying cost and total ordering costs at economic order quantity.

#### Problem 3

Olive Corporation buys a material for P20 per unit. Sixteen thousand parts a year are needed. Carrying cost is P3.00 per unit and the ordering cost is P15. Required:

- a. Compute the economic order quantity.
- b. Prepare a tabular analysis to compute the total costs assuming the following order sizes: 100 units, 200 units, 400 units, 1,600 units and 6,400 units. The table should have the following columns: order size, number of orders, cost per order, total ordering costs, average inventory, carrying cost per unit, total carrying costs, and total costs.

An invoice for X, Y, and Z is received from Heavyweight Co. Invoice totals are: X. P 125,000; Y - P 75,000; Z - P100,000. The freight charges on this shipment of 18,000 pounds total P7,500. Weights for the respective materials are 10,000, 6,000, and 7,500 pounds.

Required:

- 1. Cost per pound to be entered on the stock cards for each materials, based on cost.
- 2. Cost per pound to be entered on the stock cards for each material, based on shipping weight.

Problem 5

Maxie Company regularly buys merchandise from Dawson Suppliers and is allowed a trade discount of 20/10/10 from the list price. For the month of September, Maxie Company purchased merchandise with a list price of P100,000 and terms of 2/10, n/30.

Requirements:

- 1. The amount debited to Materials if the purchase discount is treated as other income (Purchases recorded at gross).
- 2. The amount debited to Materials if the purchase discount is treated as a reduction of purchases. (Recorded as net)

## Problem 6

The following information is to be used in costing inventory on August 31.

1011011111		Author Structure
August 1	Beginning balance	1,600 units at P6.00
5	Purchased	400 units at P7.00
9	Purchased	400 units at P8.00
16	Issued	800 units
19/1/24/19	Purchased	600 units at P9.00
27	Issued	1,000 units

Required: The cost of materials used and the cost assigned to the August 31 inventory by each of these perpetual inventory costing methods:

- 1. First-in, first-out
- 2. Average.

## Problem 7

The Bedrock Company is a manufacturer of golf clothing. During the month, the company cut and assembled 10,000 golf jackets. One hundred of the jackets did not meet specifications and were considered "seconds." Seconds are sold for P1,000.00 per jacket, whereas first quality jackets sell for P2,500.00. During the month, Work in Process was charged for P3,600,000 of materials, P4,000,000 of labor, and factory overhead is applied at 120% of direct labor (including allowance of 20% of direct labor for spoiled units)

Required: Entries required for each of the following conditions:

- a. Loss due to spoiled work is spread over all jobs.
- b. Loss due to spoiled work is charged to this specific job. (factory overhead is applied at 100% of direct labor cost
- c. Compute the unit cost of the good units under (a) and (b)

#### Problem 8

Kyralei Co. manufacture golf carts and other recreational equipment. One order for RAGC Corporation for 2,000 carts showed the following costs per unit: direct materials - P400; direct labor P200; and factory overhead applied at 140% of direct labor cost if defective work is charged to a specific job and 150% if defective work is charged to all jobs.

Final inspection revealed that wheels were assembled with improper bearings. The wheels were disassembled and the proper bearings inserted. The cost of correcting each defective cart consists of P20 added cost for bearings, P40 for labor, and factory overhead at the predetermined rate.

Required:

- A. Prepare journal entries to record correction of the defective units and transfer of the work in process to finished goods if:
  - 1. The RAGC is to be charged with the cost of defective units.
  - 2. The cost of correcting the defective units is not charged to RAGC.
- B. Compute the cost per unit of finished goods if:
  - 1. The RAGC is to be charged with the cost of defective units
  - 2. The cost of correcting the defective units is not charged to RAGC

#### Problem 9

Little Mermaid Company received an order of 5,000 automatic mixing machines. The cost per unit is: materials - P 200.00; labor - P 120.00; factory overhead applied at 150% of direct labor cost (140% in cases in which any defective unit costs are to be charged to a specific order). Final inspection revealed that 1,000 units were incorrectly assembled. To correct each defective unit requires P50.00 for materials, P30.00 for labor, and factory overhead of the appropriate rate. Then 20 units were classified as seconds and sold for P400.00 each, the proceeds being credited to the order. The customer has agreed to accept the remaining good machines, although the acceptable units are fewer than the number ordered.

# Required:

- 1. Entries if the method used is charged to specific job.
- 2. Entries if the method used is charged to all production.
- 3. Cost per unit of the finished goods if:
  - a. Method used is charged to specific job
  - b. Method used is charged to all production

#### Problem 10

The Melon Manufacturing Company uses several raw materials in its production schedule. Management wishes to use a system of selective control. The following data have been completed.

<u>Materials</u>	Yearly Usage x	<b>Unit Cost</b>	Total Cost
$1 \times 1$	10,000	P 0.50	P 5,000
1 x 2	7,100	0.65	4,615
1 x 3	2,000	2.50	5,000
1 x 4	5,250	2.00	10,500
1 x 5	6,000	1.75	10,500
1 x 6	2,750	0.80	2,200
1 x 7	1,500	1.00	1,500
1 x 8	5,500	1.85	10,175
in the second	<u>40,100</u>		P 49,490

Required: Assume that management adopts the ABC plan, prepare the necessary chart

The cost of corn trig the determine made is not

# TRUE-FALSE QUESTIONS

Indicate whether the following statements are true or false by inserting in the blank space provided a capital "T" for true or "F" for false.

1.	When prices are rising, higher income will be reported using FIFO as compared with using LIFO.
2.	Inventory methods can be changed at will to control reported net income.
3.	그리 아이를 잡으면 수 있을까요. 아이들 그들다는 사람들이 되는 그는 그를 보고 있는 그를 모으면 하는 것이다.
4.	An error in determining the cost of the ending inventory of a period generally results in misstated income for two periods.
5.	The net realizable value of an inventory item can never be greater than its expected selling price.
6.	An advantage of using LIFO yields the greatest cost of goods sold.
7.	1
8.	If spoilage in a job results is due to the exacting specifications of the job, the loss resulting from the spoiled goods should be shared by all units manufactured during the period.
	The closing entries necessary under the perpetual and periodic inventory systems do not differ because all expenses and revenues must be closed.
10.	When a company changes from one inventory costing method to another, the change must be fully disclosed in a footnote to the financial statements explaining the reasons for the change.
11.	Graphically, the economic order quantity (EOQ) is the point where the
	The primary goal of inventory management activity is to minimize the risks of a stockout while maximizing the return on inventory.
3.0	When computing the economic production run size, the costs to set up a production run are analogous to the carrying costs in the basic economic order quantity model
,	. The purchase price per unit of inventory is irrelevant in fathe economic parder quantity (FOO) model.
15.	The accounting for spoiled units and defective units is the same.

# MULTIPLE CHOICE

1. According to the net method, which of the following items should be included in the cost of inventory?

	. <u>F</u> 1	eight-co	st	Purch	ase discount	s not	<u>taken</u>
a.		Yes	_		No		
b.		Yes			Yes		
c.		No		•	Yes		
d.		No			No		

2. The weighted average for the year inventory cost flow method is applicable to which of the following inventory system?

201 10	<u>Periodic</u>	Perpetual
a.	Yes	Yes
b.	Yes	No we
c.	No	Yes
d.	No	No

- 3. During June, Delta Co. experienced scrap, normal spoilage, and abnormal spoilage in its manufacturing process. The cost of units produced includes
  - a. Scrap, but not spoilage
  - b. Normal spoilage, but neither scrap nor abnormal spoilage
  - c. Scrap and normal spoilage, but not abnormal spoilage
  - d. None of the items mentioned.
- 4. The total of the materials subsidiary ledger inventory cards must be equal to the amount in the following account
  - a. Cost of goods sold
  - b. Purchases of Raw Materials
  - c. Materials Inventory
  - d. Work in Process Inventory
- 5. Under a perpetual inventory system, the purchase of materials is recorded in the account
  - a. Purchases
  - b. Materials Inventory
  - c. Work in Process Inventory
  - d. Finished Goods Inventory

# MULTIPLE CHOICE - PROBLEMS

Marsh Company had 150 units of product on hand at January 1 costing P21.00 each. Purchases of product A during the month of January were as follows:

1. 1.		<u>Units</u>	Unit Cost
January	10	200	P 22.00
	18	250	23.00
	28	100	24.00

Physical count on January 31 shows 250 units of product A on hand.

- 1. The cost of the inventory at January 31, under the FIFO method is:
  - a. P 5,850
  - b. P 5,550
  - c. P 5,350
  - d. P 5,250

Harper Company's Job 301 for the manufacture of 2,200 T-shirts was completed during August 2016 at the following unit costs:

<b>O</b>	B + 4.245.	
Direct materials		P 20.00
Direct labor		18.00
Factory overhead (inc	ludes an	
allowance of P1	for spoiled work)	18.00
		P 56.00

Final inspection of Job 301 discloses 200 spoiled T-shirts which were sold to a jobber for P 6,000.

- 2. Assume that spoilage loss is charged to all production during August. What would be the unit cost of the good units produced on Job 301?
  - a. P 53.00
  - b. P 55.00
  - c. P 56.00
  - d. P 58.00
- 3. Assume instead, that the spoilage loss is attributable to exacting specification of Job 301 and is charged to this specific job. What would be the unit cost of the good coats produced on Job 301?
  - a. P 55.00
  - b. P 57.50
  - c. P 58.60
  - d. P61.60

Palmer Corporation is a manufacturing concern that uses a perpetual inventory system. The following data on the material inventory account is provided for 2016.

Material I. I. 275,000

Material balance
Other debits to the materials account during the year
Increase of ending over beginning inventory

275,000

825,000

55,000

4. How much is the cost of materials issued to production?

a. P 1,045,000

b. P 770,000

c. P 880,000

d. P. 430,000

Job 75 incurred the following costs for the manufacture of 200 units of motors:

Original cost accumulation	n	13,200
Direct materials	Ρ	,
Direct labor		16,000
Factory overhead (150% of direct labor)		24,000
Direct costs of reworked 10 units	la rel	2.000
Direct materials		2,000
Direct labor		3,200

The total rework costs were attributable to exacting specifications of Job 75 and the full rework costs were charged to the specific job.

#### 5. The cost of Job 75 was

a. P316

b. P 266

c. P 280

d. P 292

The following data on materials purchases and issues during the month of April were reported:

OI took		
April 1	Beginning balance	400 units at P6
5	Received	100 units at P7
.11	Received	100 units at P8
13	Issued.	400 units
15	Received	200 units at P6
22	Issued	250 units
27	Returned from factory	50 units
30	Received	300 units at P9

- 6. Assuming that the company used a perpetual inventory system, the total quantity and cost of materials purchased for the month of April should be:
  - a. 700 units at P 5,800
  - b. 700 units at P 5,810
  - c. 700 units at P 5,400
  - d. 700 units at P 6,200

The Curacha Company uses 20,000 units of Material A in making a finished product. The cost to place one order for Material A is P8.00 and the annual cost to carry one Material A is P 2.00

- 7. The economic order quantity for Material A is
  - a. 100 units
  - b. 400 units
  - c.. 283 units
  - d. 565 units
- 8. If the cost to place one order increased by P 10 and the cost to carry one Material A in stock remains the same, the economic order quantity will be
  - a.. 600 units
  - b... 447 units
  - c. 425 units
  - d. 500 units

One of the products that Justine Corporation sells is "Extra Soft" floor mats. Justine's ordering costs related to the mat is P 12.50 per order. The cost of carrying one mat in inventory for one year is P 16.00. Justine sells 40,000 of these mats evenly throughout the year.

- 9. What is the economic order quantity of Justine Corporation?
  - a. 250 units
  - b. 350 units
  - c. 400 units
  - d. 500 units
- 10. What are Justine's total ordering costs per year and total carrying costs per year at the economic order quantity?

Carrying Cost
P 1,562.50
2,560.50
2,000,00
4,000.00

One of the products that Ram Breakfast Foods manufactures is carrot juice. Ram manufactures and sells 5,000 cases of carrot juice evenly each year. manufactures and sells 5,000 cases of carrot june P 3.60 to setup a production run manufacturing costs are P 4.50 per case. It costs Ram P 3.60 to setup a production run manufacturing costs are P 4.50 per case. It costs Ram P 2.50 per year to carry a case of carrot juice in for carrot juice. It also costs Ram P 2.50 per year to carry a case of carrot juice in

11. What is Ram's economic production run size?

- 83 cases
- 85 cases
- c. 120 cases
- d. 150 cases

Euphorbia Company produces and sells a single item of product. Inventory at the beginning of September was 400 units valued at P1.80 per unit. Further receipts and sales during the month were as follows

		Units	Cost per unit
September 8	Receipts	600	P 2.10
20	Receipts Sales	500 1,250	4.00

The inventory uses the FIFO method of stock valuation. Gross margin for September was P2,500.

12. What was the cost per unit of the 500 units received on September 20?

- P 1.04
- P 1.94 b.
- P 2.00
- P 2.08

The following information pertains to Material X used by Nikki Company

Annual usage in units	20,000
Working days per year	250
Safety stock in units	800
Normal lead time in working days	30

13. If units of Material X will be required evenly throughout the year, the reorder point is

- 800 a.
- 1,600 b.
- 2,400 C.
- 3,200 **d**.

The following information relates to PRTC Company

Units required per year	
	<b>ፈ</b> ስ ስስስ
Cost of placing an order	60,000
cost or placing all order	P 900
Carming post non-	r 900
Carrying cost per unit per year	P1.200
1 5 0 001	P1.200

- 14. Assuming that the units will be required evenly throughout the year, what is the EOQ?
  - a. 200
  - b. 300
  - c 400
  - d. 450

During March, Mark Company incurred the following costs on Job 209 for the 200 motors:

Original cost accumulation:

Direct materials

Direct labor

Factory overhead

Direct costs of reworking 10 units:

Direct materials

P 660
800
P2,660
P2,660
P 100
Direct labor

P 100
P 260

Method A- The rework cost were attributable to the exacting specifications of Job 209, and the full rework costs were charged to this specific job.

Method B- The defective units fall within the normal range and the rework is not related to a specific job, or the rework is common to all the jobs.

- 15. The cost per finished unit of Job 209 using Method A is:
  - a. P15.60
  - b. P15.80
  - c. P13.30
  - d. P13.50
- 16. The cost per finished unit of Job 209 using Method B is:
  - a. P13.30.
  - b. P15.80
  - c. P15.30
  - d. P13.60

Viber Company manufactures electric drills to the exacting specifications of various Viber Company manufactures electric arms to the production of 1,100 drills was customers. During February 2014, Job 403 for the production of 1,100 drills was completed at the following cost per unit: D100

Olda artist		PIOU
Direct materials		80
Direct labor		120
Factory overhead		300
C 1	•	

Final inspection of Job 403 disclosed 50 defective units and 100 units of normal rinal inspection of Job 403 disclosed 30 dots at a total cost of P5,000 and the spoiled spoilage. The defective drills were reworked at a total cost of P5,000 and the spoiled drills were sold to a jobber for P15,000.

17. The unit cost of the good units produced on Job 403 was:

- a. P330
- b. P320
- c. P300
- d. P290

The following information relates to Blueberry Company's materials Y

Working days per year	240
Normal lead time in working days	20
Maximum lead time in working days	45

18. Assuming that the units of material Y will be required evenly throughout the year, the safety stock and order point would be

	Safety Stock	Order Point
a.	600	600
b.	600	1,350
c.	750	600
d.	750	1,350

UFC Inc. manufacture 100,000 specialized bulbs for its transformer division. The bulbs will be used evenly throughout the year. The setup cost every time a production run is made is P800 and the cost to carry bulbs in inventory for the year is P4. UFC's objective is to produce the bulbs at the lowest cost possible.

19. Assuming that each production run will be for the same number of bulbs, how many production runs should UFC make?

- 10 a.
- 14 b.
- C. 16.
- d. 19

The following information is about a company's inventory costs.

Total cost to place one order
Total cost to carry one unit

Economic order quantity 7,000 units

P 50

P 4

- 20. What is the company's estimated annual usage?
  - a. 1,000,000 units
  - b. 1,960,000 units
  - c. 1,400,000 units
  - d. 2,000,000 units
- 21. How many orders will be placed?
  - a. 143
  - b. 200
  - c. 280
  - d. 286

Norman buys baseball bats from a manufacturer at P10 each. Norman expects to sell 90,000 bats evenly over the next year. Norman's cost of capital is 10 percent. The total out-of-pocket cost to carry one bat in inventory is P0.50 and the cost of ordering bats is P15per order.

- 22. Suppose that Norman orders 3,000 bats at a time. What is the total annual inventory cost?
  - a. P 750
  - b. P 1,200
  - c. P 2,250
  - d. P 2,700
- 23. What is the economic order quantity?
  - a. 1,342 units
  - b. 1,643 units
  - c. 2,324 units
  - d. 3,000 units
- 24. How many times would Norman have to place an order in one year?
  - a. 67 times
  - b. 55 times
  - c. 39 times
  - d. 30 times

During August of the current year, Job 067 for 2,000 handsaws was completed at the following cost per unit:

	P	5.0	,0
Direct materials		4.0	0(
Direct labor Factory overhead (applied at 1)	50% of DLC)	6.00	
Factory overhead (applied a			

Final inspection revealed 100 defective units, which were reworked at a cost of P2.00 per unit for direct labor plus overhead at the predetermined rate.

25. If the defect is due to internal failure, what is the total rework cost and to what account should it be charged?

	Rework cost	Account charged
a.	P 200	Work in process
b.	P 200	Factory overhead control
. c.	P 500	Work in process
d.	P 500	Factory overhead control

# ACCOUNTING FOR FACTORY OVERHEAD

# LEARNING OBJECTIVES

Upon of this chapter, you should be able to

• Compute a factory overhead rate using the different bases

Apply the concept of actual factory overhead and applied factory overhead . Identify the compute the different methods of allocating budgeted service department to producing departments

Compute the different factory overhead variances

Apply the concept of activity based costing

All costs incurred in the factory that are not direct materials or direct labor are generally termed as factory overhead. One method to determine whether a factory expenditure is a factory overhead item is to compare it to the classification standard established for direct materials and direct labor costs. If the expenditure cannot be charged to either of these two "direct" factory accounts, it is classified as factory overhead. Factory overhead refers to the cost pool used to accumulate all indirect manufacturing costs. Examples of factory overhead include the following:

Indirect materials and indirect labor

Heat, light, and power for the factory

Rent on factory building

Depreciation on factory building and factory equipment

Maintenance of factory building and factory equipment

Factory overhead costs are divided into three categories on the basis of their behavior in relation to production. The categories are (1) variable overhead (2) fixed overhead and (3) mixed overhead.

Variable factory overhead costs - these are the factory overhead costs that vary in direct proportion to the level of production, within the relevant range. Variable cost per unit remains constant as production either increases or decreases. Total variable cost varies in direct proportion to production, that is, the greater the number of units produced, the higher the total variable costs

Fixed factory overhead costs -these are the factory overhead costs that remain constant within the relevant range regardless of the varying levels of production The total remains constant but the fixed cost per unit varies inversely with the production, that is, the greater the number of units produced, the lower the fixed cost per unit (this is the advantage of mass production - the more we produce the lesser the manufacturing cost per unit.

Mixed factory overhead costs - these factory overhead costs are neither wholly fixed Mixed factory overhead costs - these ractory overhead nor wholly variable in nature but have characteristics of both. Mixed factory overhead nor wholly variable in nature but have characteristics of both. Mixed factory overhead nor wholly variable in nature but have characteristics and variable components for costs must ultimately be separated into their fixed and variable components for purposes of planning and control.

BUDGETING FACTORY OVERHEAD COSTS Budgets are management's operating plans expressed in quantitative terms, such as units of production and related costs. After factory overhead costs have been classified as either fixed, or variable, budgets can be prepared for expected levels of production. The separation of fixed and variable cost components permits the company to prepare a flexible budget.

# FACTORS TO BE CONSIDERED IN THE COMPUTATION OF OVERHEAD RATE

#### BASE TO BE USED 1.

- a. Physical output
- b. Direct materials cost
- c. Direct labor cost
- d. Direct labor hours
- e. Machine hours

# ACTIVITY LEVEL TO USE

- a. Normal capacity
- b. Expected actual capacity

#### **FACTORY** INCLUSION OR **EXCLUSION** 3. OF FIXED **OVERHEAD**

- a. Absorption costing method used for cost accounting
- b. Direct costing method used for internal reporting (management services)

# 4. USE OF SINGLE RATE OR SEVERAL RATES

- a. Plant-wide or blanket rate one rate for all producing departments
- b. Departmentalized rate one rate for each producing department.

# BASE TO BE USED

The base to be used should be related to functions represented by the overhead cost being applied. If factory overhead is labor - oriented, the most appropriate base to use is direct labor hours or direct labor cost. If factory is investment-oriented, related to operation of machinery, then the most appropriate base will be machine hours. On the other hand, if factory overhead is material-oriented, then material cost might be considered as the most appropriate base. The simplest of all bases is physical output or units of production.

# 1. Direct labor hours

This is the most commonly used base or denominator in the computation of the predetermined factory overhead rate. The number of direct labor hours spent for a particular is readily available on the payroll sheet. This base should be used if it can established that there is a direct relationship between factory overhead and direct labor hours. It maybe used also if there is a great disparity in hourly wage rates. The formula is expressed as:

Factory overhead rate = Estimated factory overhead
Estimated direct labor hours

= Factory overhead rate/direct labor hour

# 2. Direct labor cost

This method is recommended if it can established that there is a direct relationship between labor cost and factory overhead. Just like direct labor hours, the direct labor cost is readily available on the payroll sheet. Labor rates do not change as often as material cost, so this base is more reliable that material cost. This base should not be used if there is little relationship between labor cost and factory overhead. For example if overhead is composed largely of depreciation and equipment related cost. The formula is:

Factory overhead rate = Estimated factory overhead x 100
Estimated direct labor cost

= Percentage of direct labor cost

3. Machine hours

This is appropriate when a direct relationship exist between factory overhead cost and machine hours. This may occur in companies or departments that are largely automated so that majority of the factory overhead cost consist of depreciation on factory equipment. Additional work will be required because each machine will have a time record to summarize the total machine hours used for each job. The formula is:

Factory overhead rate = Estimated factory overhead Estimated machine hours.

= Factory overhead rate/machine hour

4. Direct material cost

This method is appropriate if it can be inferred that factory overhead costs are directly related to direct material cost as in cases where direct materials are a very large part of total cost. Direct material cost is not appropriate base to when more than one product is manufactured by a company. Different products require different materials and different quantities at that, so it will be very inconvenient to use materials cost as the base because we will have compute a factory overhead rate for each product. The formula is:

- Factory overhead rate = Estimated factory overhead x 100 -Estimated direct material cost

= Percentage of direct material cost

5. Units of production

This is most simple method to use because units produced are readily available. This method is appropriate when a company or department manufactures only one product. The formula is:

Factory overhead rate = Estimated factoryoverhead Estimated units of production

= Factory overhead rate/unit of production

# ILLUSTRATIVE PROBLEM 1

The Round Table Company estimates factory overhead at P450,000 for the next fiscal year. It is estimated that 90,000 units will be produced at a material cost of P600,000. Conversion will require an estimated 100,000 direct labor hours at a cost of P3.00 per hour, with 45,000 machine hours.

Required: Compute the predetermined factory rate based on:

- a. Material cost
- b. Units of production
- c. Machine hours
- d. Direct labor cost
- e. Direct labor hours

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# SOLUTION TO ILLUSTRATIVE PROBLEM 1

a. Factory overhead rate = Est. factory overhead Est. direct mat. cost

 $= \frac{P 450,000}{P 600,000} \times 100$ 

= 75% of direct mat. cost

b. Factory overhead rate = Est. factory overhead Est. units of production

= <u>P 450,000</u> 90,000 direct labor hours

= P 5.00/unit

c. Factory overhead rate = Est. factory overhead Est. machine hours

 $= \frac{P \, 450,000}{45,000 \text{ machine hours}}$ 

= P 10.00/machine hour

- d. Factory overhead rate
- Est. factory overhead Est. direct labor cost
- $= \frac{P450,000}{P300,000} \times 100$
- = P 150% of direct labor cost
- e. Factory overhead rate
- = Est. factory overhead Est. direct labor hours
- $= \frac{P450,000}{100,000 \text{ direct labor hours}}$
- = P 4.50/direct labor hour

The rates computed above are known as the plant-wide or blanket rate. All departments in the company will use the same application rate for factory overhead and also the same base. A single plant wide factory application rate can be used when either a single product is being manufactured or when the different products being manufactured pass through the same series of productive departments and are charged similar amounts of applied factory overhead. Multiple departmental factory overhead application rates are preferable when the different products being manufactured either do not pass through the same series of productive departments or, if they do, they should be charged dissimilar amounts of applied factory overhead because of the differing amounts of attention each product receives.

# STEPS IN COMPUTATION OF DEPARTMENTALIZED OVERHEAD RATE

- 1. Divide the company into segments, called departments, cost centers, to which expenses are charged.
- 2. Estimate the factory overhead for each department (direct departmental charges + indirect departmental charges).
- 3. Select and estimate the base to be used by each department.
- 4. Allocate the service department costs to the producing departments.
- 5. Compute the factory overhead rate (similar to computation using blanket rate).

In a department. The procedures for distributing the budgeted departmental expenses are identical to those used to allocate the actual factory overhead expenses. Prior to the computation of the departmentalized factory overhead rate, management must make sure that the service department costs have been allocated to the producing departments. Departmentalized overhead rates are for the producing departments only. Producing departments, which include the production lines, are the cost-accumulation centers in which work is performed directly on the goods being produced. On the other hand, service departments, which include such activities as maintenance, personnel, employee services, and the provision of heat, power, and light, are necessary for the entire factory - including the producing departments - to remain in operation.

# TYPICAL ALLOCATION BASES FOR COMMON COSTS

Most common costs can be grouped into four:

- 1. Labor-related common costs
- 2. Machine-related common costs
- 3. Space-related common costs
  - 4. Service-related common costs

Common costs should be analyzed carefully to determine the most appropriate allocation base. The typical allocation bases for common costs are shown below

# **COMMON COST**

#### Labor-related

- 1. Supervision
- 2. Personnel services

# Machine-related

- 3. Insurance on equipment
- 4. Taxes on equipment
- 5. Equipment depreciation
- 6. Equipment maintenance

# Space-related

- 7. Building rental
- 8. Building insurance
- 9. Heat & air-conditioning
- 10. Concession rental
- 11. Interior bldg. maintenance

# TYPICAL ALLOCATION BASE

No. of employees, payroll amount of DLHrs Number of employees

Value of equipment Value of equipment

Machine-hours, equipment value

Number of machines, machine hours

Space occupied Space occupied

Space occupied, volume occupied

Space occupied & desirability of location

Space occupied

#### Service-related

12. Material handling

13. Billing and accounting

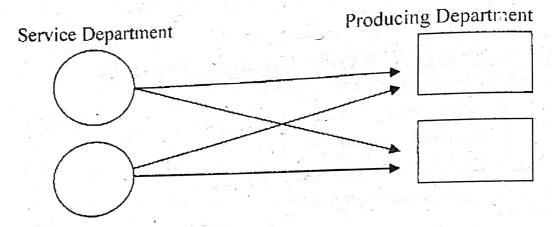
14. Indirect materials

Quantity or value of materials Number of documents Value of direct materials

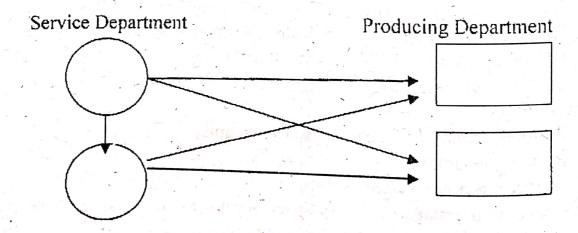
# METHODS OF ALLOCATING SERVICE DEPARTMENT COST TO

PRODUCING DEPARTMENTS

Direct method - the most widely used method. This method ignores any service rendered by one service department to another, it allocates each service department's total cost directly to the producing departments.

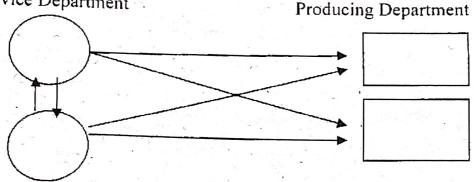


2. Step method - sometimes called sequential method of allocation. This method recognizes services rendered by service departments to other service departments and is more complicated because it requires a sequence of allocation. sequence typically starts with the department that renders service to the greatest number of other service departments and ends with the department that renders service to the least number of other departments. Once a service department's costs are allocated, no subsequent service department costs are allocated to it.



3. Algebraic method - sometimes called reciprocal method. This method allocates costs by explicitly including the mutual services rendered among all departments.

Service Department



# ILLUSTRATIVE PROBLEM 2

Kappa Gamma Company's factory is divided into four departments - producing departments; Molding and Decorating, serviced by the Buildings and Grounds and the Factory Administration departments. Buildings and Grounds cost will be allocated using square feet (floor area) and Factory Administration cost will be allocated using direct labor hours. In computing predetermined overhead rates, machine hours are used as the base in Molding and direct labor hours as the base in Decorating.

			Bldgs. &	Factory
	Molding	Decorating	Grounds	Adm.
Budgeted FO	P400,000	P600,000	P80,000	P120,000
Direct labor hours	200,000	100,000		
Floor area	100,000	60,000	2,000	4,000
Machine hours	200,000	100,000		2-2

Requirements: Allocate the cost of the service departments using:

- 1. Direct method
- 2. Step method start with Bldgs. & Grounds
- 3. Algebraic method

# SOLUTION TO ILLUSTRATIVE PROBLEM

# 1. Direct method

THE TOT AND VALOR	<u></u>		
	Molding Decorating	<u>B &amp; G</u>	FA.
Budgeted FO	P400,000 P600,000	P80,000	P120,000
Allocated FO			
B&G	50,000 30,000	(80,000)	
FA	80,000 40,000		(120,000)
Total FO	<u>P530,000</u> <u>P670,000</u>	A subject to	ire de la
Base	200,000 MHrs. 100,000DLHrs.		
FO Rate	P 2.65/MHr. P 6.70/DLHr.		

Allocation of B & G cost

Molding = 
$$\frac{100}{160}$$
 x 80,000

Decorating =  $\frac{60}{160}$  x 80,000

Allocation of FA cost

Molding =  $\frac{200}{300}$  x 120,000

Decorating =  $\frac{100}{300}$  x 120,000

## 2. Step method

	Molding	Decorating	<u>B &amp; G</u> P80,000	FA P120 000
Budgeted FO	P400,000	P600,000	P80,000	P120,000
Allocated FO				
B&G	48,781	29,268	(80,000)	1,951
FA	81,301	40,650		(121,951)
Total FO	P530,082	P669,918	Ella Porchet and	
Base	200,000 MHrs.	100,000 DLF		
FO Rate	P2.65/MHrs.	P6.70/DLH	<u>lr</u> .	

# Allocation of B & G cost Molding = $\frac{100}{164}$ x 80,000 Decorating = $\frac{60}{164}$ x 80,000 FA = $\frac{4}{164}$ x 80,000

# 3. Algebraic method

Additional information for the illustrative problem:

	Services	s provided by		
	<u>B &amp; G</u>	FA		
Molding	50%	40%		
Decorating	30%	50%		
B & G	• 1	10%		
FA	20%	r		

Algèbraic equation:

$$B \& G = 80,000 + 10\% (FA)$$
  
 $FA = 120,000 + 20\% (BG)$ 

Substitution:

The allocation will be as follows:

	Molding	Decorating	B & G	FA
Budgeted FO	P400,000	P600,000	P80,000	P120,000
Allocated FO				
B&G	46,939	28,163	(93,878)	18,776
FA	55,510	69,388	13,878	(138,776)
Total FO	P502,449	P697,551		
Base	200,000 MHrs	100,000 DLH	lrs	de a serie
FO rate	P2.51/MHr.	P6.98/DLH	<u>r.</u>	

# CAPACITY PRODUCTION

In the estimation of manufacturing overhead, as well as the estimation of the base to be used for allocation, it is important to determine what capacity of production should be adopted.

a. Theoretical, maximum or ideal capacity - a capacity to produce at full speed without interruptions. It gives no allowance for human capacity to achieve the maximum nor due allowance for any circumstances that might result to a stoppage of production within or not within the control of management. At this capacity level, the plant is assumed to function 24 hours a day, 7 days a week, and 52 weeks a year without any interruptions in order to yield the highest physical output possible.

- b. Practical capacity a capacity of production that provides allowance for circumstances that might result to stoppage of production.
- C. Expected actual capacity a capacity concept based on a short range outlook which is feasible only for firms whose products are seasonal or where the market and style changes allow price adjustments according to competitive conditions and customer demands.
- d. Normal capacity a capacity of production taking into consideration the utilization of the plant facilities to meet commercial demands served over a period long enough to level out the peaks and valleys which come with seasonal and cyclical variations. This capacity is commonly used in the computations of overhead rates.

# METHOD OF ACCUMULATION OF FACTORY OVERHEAD COSTS

- 1. Non-controlling account system an account for each kind of overhead expense according to their nature is opened in the ledger and charges to such account are made upon incurrence of the expense.
- Controlling account system an Overhead Control account is opened in the general ledger wherein the overhead incurred are charged and a subsidiary ledger is maintained to show in detail the nature and account of the expense.

Actual overhead costs are usually incurred daily and recorded periodically in the general and subsidiary ledgers. Subsidiary ledgers permit a greater degree of control overhead factory overhead costs as related accounts can be grouped together and the various expenses incurred by different departments can be described in detail.

# Computation of overhead chargeable to individual cost sheets - (factory overhead applied)

After the factory overhead application rate has been determined, it is used to apply (or match) estimated factory overhead costs to production. The estimated factory overhead costs are applied to production on an on-going basis as goods are manufactured, according to the base used (i.e., as a percentage of direct material costs or direct labor cost or on the basis of direct labor hours, machine hours, or units produced). Applied factory overhead can be computed by multiplying the actual factor incurred per cost sheet x predetermined overhead rate.

Entry to charge production with applied overhead:

Work in process - overhead xxx Factory overhead applied

xxx

<u>Factory overhead variance</u> - the difference between the actual factory overhead as shown by factory overhead control account and the overhead charged to production as shown by the factory overhead applied account.

# Classification of manufacturing overhead variance

- a. Underapplied overhead the difference between actual overhead and applied overhead when the actual is more than the applied.
- b. Overapplied overhead the difference between actual overhead and applied overhead when the actual is less than the applied.

# Causes of the manufacturing overhead variance:

- a: Spending variance the variance due to expense factors.
- b. Idle capacity or volume variance the variance due to difference in volume and activity factors.

# Computation of manufacturing overhead variance

a. Spending variance Actual factory overhead incurred	P	xxx
Less: Budget allowed based on capacity used		
Fixed factory overhead P xxx		
Variable factory overhead <u>xxx</u>	· "	XXX
Spending variance	<u>P_</u>	XXX
b. Idle capacity variance	D	
Budget allowed based on capacity used	P	XXX
Less: Factory overhead applied	1 ml 1 mg	XXX
Idle capacity variance	<u>P</u>	XXX

# Accounting for overhead variance

a. During the period prior to the closing of the books, the overhead variance is not recognized in the account and the actual factory overhead account as well as the applied factory overhead accounts are kept open. When interim financial statements are prepared and the variance is expected to be absorbed prior to year-end, such variance should be deferred rather than disposed of immediately.

# b. At the end of the accounting period

- 1. If the amount of the overhead variance is immaterial or it is established to be the result of inefficiency, it is closed to cost of goods sold.
- 2. If the amount of the overhead variance is material and found to be the result of an erroneous computation of the predetermined overhead rate, such variance is distributed to the cost of goods sold, finished goods inventory, and the work in process inventory.

#### ILLUSTRATIVE PROBLEM 3

The Davidson Corporation made the following data available from its accounting records and reports.

Budgeted factory overhead		P300,000
Budgeted direct labor hours	- jaran	100,000 hrs.
Variable factory overhead rate	行。	P 1.00/DLHr.
Actual factory overhead		P350,000
Actual direct labor hours used		110,000 hrs.

#### Solution:

# Spending variance:

Actual factory overhead	P350,	000
Budget allowed on actual hours		
Fixed	P200,000	~
Variable	110,000 310,0	000
Spending variance - unfavorable		000

# Idle capacity variance:

capacity vill intec.	
Budget allowed on actual hours Applied factory OH (110,000 x P3.00) Idle capacity variance - favorable	P310,000 <u>330,000</u> P(20,000)

To understand fully the computation of the variance, the following table may be prepared:

Fixed overhead Variable overhead Total	Total       Per Hour         P 200,000       P 2.00         100,000       1.00         P 300,000       P 3.00
Factory overhead rate	= <u>300,000</u> 100,000 hrs. = P 3.00/DLHr.
Variable overhead cost	= 100,000 Hrs. x P 1.00 = P 100.000

# **ACTIVITY BASED COSTING**

The growth in the automation of manufacturing has brought many challenges to product costing. Increased use of robotics, specialized machinery, and other computer-driven processes has changed the nature of manufacturing and the composition of total product cost. In many highly-automated manufacturing businesses the significance of direct labor cost has diminished and overhead costs have increased. The cost of acquiring installing, maintaining, and operating state-of-art manufacturing technologies has greatly increased overhead costs. In addition, costs that used to be classified as indirect such as quality control, computer programming, trouble shooting, and middle level management costs have become major components of total production cost.

In highly automated manufacturing environments, overhead application rates based on direct labor may not provide accurate overhead charges because they no longer represent cause and effect relationship between output and overhead costs. The need for more representative overhead application bases has led to activity-based costing (ABC) which is also known as transaction costing. Those activities (transactions) that consume overhead resources are identified and related to the costs incurred. The basic premise in activity-based costing is that overhead costs that are caused by activities are traced to individual product units on the basis of frequency of consumption of overhead resources by each product.

Traditional overhead is applied to production using one of the application bases which were have previously discussed such as direct labor hours, machine hours, direct labor cost, direct material cost and units of production. Direct labor hours, direct labor costs, machine hours, machine hours, or units produced are volume based application costs, machine hours, machine hours, or units produced are volume based application bases. Volume-based production means that the more units estimated to be produced, the larger the denominator in the equation used to determine the overhead rate, thus the smaller the overhead application rate and it follows that the amount of overhead assigned to each unit will be lesser so overhead will be underapplied which is unfavorable.

Activity-based costing is a simple concept which can provide accurate information about a particular product's consumption of overhead resources. ABC is an approximation of a user's fee. A user's fee refers to the process of charging for services consumed by users of the service. ABC is based on the premise that if a product consumes many resources (activities) that comprise overhead, it should bear a greater share of overhead costs than other product that does not consume as any activity units. In other words, activity costing is also like riding the LRT, the more you ride, the more cards you need to buy.

# FIVE BASIC STEPS IN APPLYING ABC

- 1. Assemble similar actions into activity centers
- 2. Classify costs by activity center and by type of expense
- 3. Select cost drivers
- 4. Compute a cost function to associate costs and cost-drivers with resource use
- 5. Assign cost to the cost objective

# Assemble similar activities into activity centers

There are several number of actions performed in any organization so it will be difficult to relate to the cost of every action to a cost driver and then to the product. Therefore, it will be best to combine actions into activity centers. One way of grouping actions is to classify them with different levels of activities; namely, unit-level activities, batch-level activities, product-level activities, and facilities-level activities. Unit-level activities are performed each time a unit is produced. Example assembly, stamping, and machining. Costs of these activities vary with the number of units produced. Batch-level activities are performed each time a batch of units is produced. The costs of these activities vary according to the number of

batches but remain fixed for all units in the batch. Examples – machine set-ups, order processing, and materials handling. Product-level activities are those performed as needed to support the production of each different type of product. Examples – production scheduling, product designing, and parts and products testing. Facility-level activities are those which sustain a facility's general manufacturing process. Examples – plant supervision, building occupancy, and personnel administration.

Classify costs by activity center and by type of expense.

Assign costs to the activity centers where they are accumulated while waiting to be applied to products. Costs that are traceable to the activity center should be assigned directly to activity centers. Other costs shared by two or more activity centers should be assigned according to some cost driver that controls the utilization of the costs involved.

#### Select the cost drivers

The cost drivers are the links between cost, activity, and product. Cost drivers are not needed for direct costs because these can be traced immediately to a product, However, indirect costs such as factory overhead need links or drivers to link a pool of costs in an activity center to the product.

#### Calculate a cost function

A cost function is used to translate the pool of costs and cost driver data into a rate per cost driver unit or a percentage of other cost amounts, just like the plant-wide or departmentalized factory overhead rate. For example, if the costs of the setup activity center is P25,000 and the selected cost driver is 500 hours, then the cost function will be P50 per setup hour (P25,000/500 hours).

Assign cost to the cost objective

The last step is to allocate the costs to the different users of the resource. This is done by multiplying the rate determined in the preceding paragraph by the actual data of the cost driver. If actual setup hours used is 40, then the allocated cost will be P2,000 (40 hours x P50).

We now illustrate ABC by comparing it to one of the volume-based overhead allocation procedures, namely direct labor hours. For instance, NDL Company has three products, namely: C, D, and E and three related overhead activities: product-line setups, number of handles and number of parts. The number of setups refer to

the number of times each product line is readied for production. The number of handles refers to the number of times each product is moved from one work station to another. The number of parts refers to the number of parts that is used in making each product. The production, overhead activities and their corresponding costs are shown on the table below:

Product         Produced         DL Hrs         Cost           C         20         30         P 300           D         100         150         1,500           E         100         70         700	Total <u>DM Cost</u> P 600 3,000 3,000	No.of Setups 2 4 2	Times Handled 2 2 2 2	No.of Parts 1 2 2
Budgeted cost of each cost driver		Р	6,200	7
Setups			3,300	
Times handled		I	3.000	1. 1. 1. 1. 1.
No of parts  Total budged overhead cost	1 00 1	<u>P</u>	12,500	autod og

The overhead application rate using direct labor hours, as base, would be computed as P 12,500/250 direct labor hours =

Factory overhead rate P 50.00 per direct labor hour

Using direct labor hours as the base, factory overhead will be applied to the three products as follows:

Product	Total Overhead Applied	No. of Units	OHCost/unit
C	$30 \text{ hrs. } \times P50 = P = 1,500$	20	P 75
D	$150 \text{ hrs. } \times P50 = 7,500$	100	75
E	70 hrs. x P50 = $3,500$	100	35

The applied factor overhead when combined with the prime cost of each product will show the following

Direct materials	Product C	Product D	Product E
Direct labor	P 600	P 3,000	P 3,000
Factory overhead applied	300	1,500	700
Total cost	P 2.400	7,500	3,500
Cost per unit	<u>P 120/unit</u>	P 12,000	P 7,200
and the second of the second	<u>1 120/um</u>	<u>P 120/unit</u>	P. 72/unit

Under activity-based costing the factory overhead rate is determined by dividing the total costs of each overhead activity by the total frequency for each activity.

Setup (P6,200/8)

Handling (P3,300/6)

No. of parts (P3,000/5)

= P 775.00 per setup

= 550.00 per handling

= 600.00 per part

The full cost per unit of each product will be determined as follows:

	A		10 1101
Direct materials	Product C	Product D	Product E
Direct labor	P 600	P 3,000	P 3,000
	300	1,500	700
Factory overhead	<u>3,250</u>	5,400	3,850
Total cost	P 4,150	P 9,900	P 7,550
Cost per unit	P 207.60	P 99.00	P 75.50

The applied overhead cost of the products were determined as follows:

Product C		
Setups	2 at P 775.00	P1,550.00
Handling	2 at P 550.00	1,100.00
No. of parts	1 at P 600.00	600.00
Total overhead		P3,250.00
Product D		howteeth eliter
Setups	4 at P 775.00	P3,100.00
Handling -	2 at P 550.00	1,100.00
No. of parts	2 at P 600.00	1,200.00
Total overhead		P <u>5,400.00</u>
Product E	na tagada ay dibibliga. Il selakta	
Setups	2 at P 775,00	P1,550.00
Handling	2 at P 550.00	1,100.00
No. of parts	2 at P 600.00	1,200.00
Total overhead		P3.850.00

Under the traditional method, direct labor does not explain the cause-effect relationship between the products and incurring of overhead costs. On the table above, it can be seen that Product D has the highest cost followed by Product E. Product C has the lowest allocated overhead because C consumes less overhead activities than the other two products. By concentrating on each product's consumption of the major cost component (overhead), activity costing avoids the problem of overstating costs of products that are low level consumers of overhead activities and understating costs of products that are high level consumers.

# **QUESTIONS**

- 1. What are the three categories of factory overhead expenses?
- 2. What are the two types of departments found in a factory? What is the function or purpose of each?
- 3. What are the different methods of distributing service department costs to producing departments?
- 4. What are the shortcomings of waiting until the actual factory overhead expenses are known before recording such costs on the job cost sheets?
- 5. How is the total overhead variance calculated?
- 6. How is the idle capacity variance calculated?
- 7. What is the spending variance?
- 8. What are the two ways that an under-or overapplied factory overhead balance can be disposed of at the end of a fiscal period?

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9. How does maximum capacity differ from normal capacity?

the set of the contract of the second

10. What are the two methods of accumulating factory overhead?

#### **PROBLEMS**

# Problem 1

The Denmark Company estimates its factory overhead for the next period at P 1,000,000. It is estimated that 20,000 units will be produced at a materials cost of P 800,000 and will require 50,000 direct labor hours at an estimated cost of P500,000. The machines will run about 160,000 hours.

Required: The predetermined factory overhead rate based on:

- 1. Material cost
- 2. Units of production
- 3. Machine hours
- 4. Direct labor cost
- 5. Direct labor hours

#### Problem 2

The Marco Company budgeted overhead at P510,000 for the period for Department A, on the basis of a budgeted volume of 200,000 direct labor hours. At the end of the period, the Factory Overhead Control account for Department A had a balance of P540,000; actual direct labor hours were 210,000 Required:

- 1. Compute for the overhead application rate
- 2. Compute for the applied factory overhead
- 3. Compute for the over-or underapplied overhead

# Problem 3

Marvin Company's estimated factory overhead for the year was P 456,120 and the actual overhead was P 470,800. Machine hours were used in determining the factory overhead application rate. There were 84,500 actual machines and 81,450 estimated machine hours during the year.

Required:

- A. Prepare journal entries to record the following
  - 1. The applied factory overhead
  - 2. The actual factory overhead
    - 3. The closing of the applied overhead account and actual factory account
- B. Assume the following amounts of applied factory overhead in each account.

Cost of goods sold P 350,000
Finished goods inventory – end 100,000

Work in process inventory – end 23,200

Allocate the over-or underapplied factory overhead to these three accounts

The Ellery Corporation uses the job order cost system of accounting. Shown below is a list of the jobs completed during the month of March showing the charges for materials requisitioned and for direct labor cost. Direct labor

Job	Material Cost	Direct labor
	P 300	P 600
123	1,080	940
124		1,400
125	720	5,120
126	4,200	5,120

Required:

Assuming that factory overhead is applied on the basis of direct labor costs and that the predetermined rate is 180%, compute:

- 1. The amount of overhead to be added to the cost of each job completed
- 2. The total cost of each job completed during the month.

#### Problem 5

Thermal Corporation has two producing department and two service departments labeled P1, P2, S1, and S2, respectively. Direct costs for each department and the proportion of services costs used by various departments are as follows:

Cost Direct			t Direct Proportion of services u			
Center		Costs	<u>S1</u>	<u>S2</u>	<u>P1</u>	P2
P1	<b>P</b>	90,000		The will be		
P2	~ .	60,000	onaths to re-	A SINGLE SING	116-12-0	STUDEN SERVICE
<b>S</b> 1-		20,000		.80	.10	.10
<b>S2</b>		32,000	.20	-	.50	.30

In calculating predetermined overhead rates, machine hours are used as the base in Pl and direct labor hours as the base in P2.

	(1861)	P2
Machine hours	50,000	40,000
Direct labor hours	40,000	20,000 -

# Requirements:

- 1. Allocate the service department costs to operating departments and compute the factory overhead rate for P1 and P2 using the following methods:
  - A. Direct Method
  - Step method start with S1
  - Algebraic method C.
- 2. Assume the company uses just one basis for applying overhead to jobs going through both P1 and P2, compute the overhead rate using direct labor hours as

# Problem 6

The ABC Company has two service departments and two producing departments

Service Departments' to costs:

Department 1 - Repair Department 2 - Cafeteria	P 14,000 11,000
1 - to a Domestic control	11,000

Producing Departments' Factor, Ott.

Dengetment A	ractory OH Costs	
Department A -	Machinery	52,500
Department B -	Assembly	48,000

# Additional information

Department	Square Feet	Est. Direct Labor Hours
Repair	1,500	3,500
Cafeteria	1,800	1,200
Machinery	2,000	2,300
Assembly	3,000	1,700
Total	<u>8.300</u>	8,700

The costs of the Repair Department are allocated on the basis of square feet. The costs of the Cafeteria Department are allocated on the basis of estimated direct labor hours. The producing departments use estimated direct labor hours: 1,500 in Department A and 1,250 in Department B.

Required: Allocate the total costs of the service departments to the producing departments (compute the departments' factory rate) by using the following:

- 1. Direct method
- 2. Step method start with the Repair Department

# Problem 7

Central Parkway Corp. has two producing and two service departments labeled P1. P2, S1, S2, respectively. Direct costs for each department and the proportion of service costs used by the various departments are as follows:

Cost	Direct-	Prop	ortion o	f services	used by:
Center	Costs	<u>S1</u>	<u>S2</u>	<u>P1</u>	P2
P1	P-1.20,000				
P2 -	80,000			ender a m	Min o
SI	25,000		.25	.50	.25
S2	10,000	.10		.50	.40

Required: Allocate the service department cost using algebraic method.

#### Problem 8

Megastar Company's normal operating capacity is estimated at 95,000 machine hours per month. At this operating level, fixed factory overhead is estimated to be P 34,200 and variable factory overhead is estimated to be P41,800. During November, the company operated 100,000 machine hours. Actual factory overhead for the month totaled P78,600.

Required: Compute for the following

- 1. The over or underapplied factory overhead
- 2. The spending variance.
- 3. The idle capacity variance.

### Problem 9

Normal annual capacity for Abner Company is 72,000 units, with fixed factory overhead budgeted at P33,840 and an estimated variable factory overhead rate for P4.20 per unit. During October, actual production was 5,400 units, with a total overhead of P15,910.

Required: Compute for the following

- 1. The applied factory overhead
- 2. The over or underapplied factory overhead
- 3. The spending variance
- 4. The idle capacity variance

# Problem 10

Norman Corporation uses a flexible budget system and prepared the following information for 2012.

	Normal Capaci	ty Maximum Capacity
Percentage of capacity	80%	100%
Direct labor hours	48,000	60,000
Total budgeted factory overhead	P252,000	P270,000

Norman planned to operate at normal capacity but actually operated at 90% of maximum capacity during 2012. The actual factory overhead for 2012 was P273,000. Requirements:

- 1. Using HI-LO method, compute for the variable rate per hour.
- 2. Determine the fixed portion of the budgeted factory overhead.
- 3. Compute for the spending variance.
- 4. Compute for the Idle capacity variance.

#### Problem 11

The Strawberry Corporation has the following information relating to applied and actual factory overhead:

ontrol P30.500
ontrol P30,500
ممسحما
39,700
e in the following accounts.
חחת הכת
Cess inventory 2 500
ods inventory 4,200

Required:

- a. Allocate the under or overapplied factory overhead to those accounts distorted by using what turned out to be an incorrect factory overhead application rate.
- b. Prepare the end-of-period entries.

### Problem 12

For many years Tinor Company has used a manufacturing overhead rate based on direct labor hours. A new plant accountant has suggested that the company may be able to assign overhead costs to products more accurately by using an activity-based costing system. The accountant explains that by creating an overhead rate for each production activity that causes overhead costs, the resulting product costs will reflect an accurate measure of overhead cost. The direct material cost is P120 per unit. The budgeted hours is 8,030 direct labor hours. The accountant has identified activity centers to which overhead costs are assigned. The cost pool amounts for these centers and their selected activity drivers for 2012:

ACTIVITY CENTERS	COSTS	ACTIVITY DRIVERS
Materials handling	P 60,000	1,200 times handled
Scheduling and setups	80,000	400 setups
Design section	10,750	100 changes
No. of parts	50,000	500 parts
	P 200,750	된 발생하다 가는 이 중 하는 그는 항

The company's products and other operating statistics follow:

	Qty.	DLH	DL	No. of time	No. of	No. of	No. of
Prod.	Produced	Used	Cost	Handled	Parts -	Changes	Setups
A	50	100	P6,000	20	6		5
B	100	300	18,000	40	10	5	7

Required:

1. Compute the unit cost for each product using direct labor hours as the overhead application base.

2. Compute the unit costs for each product using activity-based costing

TRUE-FAI	LSE QUESTIONS Falso by inserting in the
Indicate whe	ther the following statements are true or false by inserting in the blank
shace brovid	ed, a capital "T" for true or "F" for false.
1.	Service departments are sometimes called indeterminate cost centers, while production departments would be the final cost centers.
2.	Service departments are production departments, such as assembly departments, that manufacture goods.
3.	One of the purposes of service department cost allocation is to value inventory for external financial reporting.
4.	The direct method is a method of cost allocation that charges costs of service departments to user departments and ignores any services used by other service departments.
5.	Under the step method of cost allocation, the final amount of pesos allocated to any production department is influenced by the order in which the allocation is made from the service departments.
6.	If there are no interservice department activities, then all three allocation methods will give identical results.
7.	When a plantwide rate is used, this means that a single rate used to allocate overhead to all departments in the company.
8.	With the algebraic method, each department's costs are set out in an equation where total costs equals the sum of direct costs and allocated costs.
200	Interservice departments activities are fully ignored by both the direct and step methods of cost allocation.
10	. Overapplied overhead occurs when actual is less than applied OH.
	total overhead for the past period by the total overhead allocation base for the coming period.
12	. When overapplied overhead is assigned to Cost of Goods Sold, the
	and outside off of Cond- C-11
	difference between the estimated and actual OI
15	volume variance would always he zero
10	The sum of the spending variance and the volume variance equals the total manufacturing overhead variance.

MULTI	PLE CHOICE	III stra goitarillana handhara mataga aldainar a	JT 2
1 120	ison willow of the lol	plied was P120,000, while activity levels would be the same plied was P120,000, while activity levels was plied was proposed to be the same lower of the above?	ed was
a.	Direct labor activity wa	as overestimated. The practical capacity of idealized	.C
b.	Overhead was overapp	Except for expected activity. 000,P4 yd beil	.0
c.	Overhead was underap	For all three activity levels .000,49 vd bailq	
.b t at the	d tsum eoneraffib din. er product demand, bu	e reported as a loss for the period.	6. Wi
2. Dep	reciation based on the proof of	debiovenu one betegicities not sangoge emit en number of units produced would be classified a	as what
a.	Out-of-pocket	Expected productive capacity	
b.	Marginal	Normal productive capacity	
C.	Variable	Theoretical or maximum productive capacity	.0
d,	Fixed	Practical productive capacity	and the same of th
that a b. c. d	Considers reciprocal se Direct method Step method Out-of-step method Algebraic method	ntenance, set-up time, houdays, weekends, etc.  Expected productive capacity  Normal productive capacity  Theoretical or maximum productive capacity  Practical productive capacity	orde main a. a. b. c.
4. In the state of	he determination of fa i tot not uction of fa rula is the:	ctory overhead application rates, the numerate its no besed it is level vince capacity for the head of the control of the cont	or of the
	Actual factory overhe	ad for the next period	3.
b.	Estimated factory over	Normal productive capacity	.8
c.	Actual labor hours for	Theoretical or maximum productive capacity	200
d.	Estimated labor hours	for the next period	
		Practical productive capacity	. 3.2

- 5. The variable factory overhead application rate under the normal, practical, and expected activity levels would be the same
  - a. Except for normal volume
  - b. Except for practical capacity
  - c. Except for expected activity
  - d. For all three activity levels
- 6. Which productive capacity level does not consider product demand, but at the same time accounts for anticipated and unavoidable interruptions in production?
  - a. Expected productive capacity
  - b. Normal productive capacity
  - c. Theoretical or maximum productive capacity
  - d. Practical productive capacity
- 7. Which productive capacity level does not have provision for either a lack of sales orders or interruptions in production (due to work stoppages, machine repairs and maintenance, set-up time, holidays, weekends, etc.
  - a. Expected productive capacity
  - b. Normal productive capacity
  - c. Theoretical or maximum productive capacity
  - d. Practical productive capacity
- 8 Which productive capacity level is based on estimated production for the next period..
  - a. Expected productive capacity
  - b. Normal productive capacity
  - c. Theoretical or maximum productive capacity
  - d. Practical productive capacity

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# Chapter 8 Accounting for Factory Overhead

- 9. Which of the following describes a part of the step method of allocation?
  - a. All services between intermediate cost centers are simultaneously allocated to final cost centers.
  - b. It ignores services between intermediate cost centers
  - c. Linear algebra is required for the allocation
  - d. Once an allocation is made from one service department, no further allocation is made to this department.
- 10. Which of the following is not true of the methods of allocating service department costs to user departments?
  - a. A cause and effect basis is the preferred method of allocation

asserted medical, compute for the Burtabas first Grains M. and

- b. Each method allocates the same total cost when there are no interservice department activities.
- C. If a cause and effect relationship cannot be established for service department costs, then an allocation cannot be conducted.
- d. The level of detail associated with allocating service department costs should be decided on a cost-benefit basis.

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Which of the following describes a part of the step method of allocation?  All services between integer and properties of the step method of allocations?  The following information for Ram Corporation relates to guestions in formation for Ram Corporation relates to guestions.			
All services between SMT the step method of allocation?			
MULTIPLE CHOICE - PROBLEMS  The following information for Ram Corporation relates to questions 1 and 2  The following information for Ram Corporation relates to questions 1 and 2  The following information for Ram Corporation relates to questions 1 and 2			
The following information for Ram Corporation Total			
Service denartments ( Total community and magical por 71 960 405			
The following information for Ram Corporation  Service departments (total estimated costs)  Building and ground maintenance  Storeroom  Storero			
Storeroom Storeroom Storeroom Storeroom			
Producing departments (estimated factory-overhead to the department A			
Department A			
Department B			
Department B  service and effort basis is the preferred methods of allocating service  a. 04 cause and effort basis is the preferred method and proof of the preferred method			
a. 04 cause and effort basis is the preferred method of allocation and b. 0023th method of allocation of the preferred method of allocation of the preferred method of allocation of the preferred method of allocations of the preferred method method of the preferred method m			
Storeroom 12:500 d			
b. 00%2h method 008cates the 250ph total cost when the themservice 004phrtment actions 2000.1			
Department B			
C. If a cause and effect relationship cannot be established for service department is the base to be used for allocating of the cost of Building and ground maintenance is the base to be used for allocating of the storeroom cost is the number of requisitions. Direct labor hours			
square foot and for the storeroom cost is the number of requisitions. Direct additionals			

square feet and for the storeroom cost is the number of rec are used to compute the producing departments' factory overhead application rawte

- 1. Using the direct method, what is Department A's factory overhead rate?
  - a. P 30.30
  - b. P 47.46
  - c. P 55.70
  - d. P 60.53
- Using the algebraic method, compute for the Building and Grounds Maintenance Department total amount to be allocated to the Storeroom Service Department and both producing departments. (Take all calculations to four decimal places but round all answers to the nearest peso)
  - a/ P 21,960
  - b. P22,584
  - c. P23,467
  - d. P24,722

Boone Manufacturing had worked on two jobs, Job 101 and Job 102 last year. The estimated manufacturing overhead for last year was P 30,000 (fixed) and P5.00 per direct labor hour (variable) and estimated 2,000 direct labor hours. The factory overhead control account has a balance of P 37,000. Actual hours used for Job 101 was 1,200 and for Job 102 was 1,000.

- 3. What is the total spending variance?
  - a. P4,000 unfavorable
  - b. P3,000 unfavorable
  - c. P4,000 favorable
  - d. P7,000 favorable
- 4. What is the total production variance?
  - a. P4,000 unfavorable is homeourne a medianticing uni voltet un a sund redal
  - b. P3,000 unfavorable
  - c. P3,000 favorable
  - d. P7,000 favorable

The following information relates to Fay Corporation for the past accounting period.

Producing Departments Service Departments P60,000 P20,000 P80,000 P15,000 Direct costs

S. If topper present on a fill being adopted what while be the ra

P132,000 of manufacturing or chead costs, Furthy year, only f

were loaned bin PESS, 400 of corbead cost was incor

b. R. I. S. O. Averandiced

Magnadine 000.5 4 .0

d. P3,500 andergolled

for sed on direct table notice that is thereif on machine nor

Proportion of service by A to:

- 10%
- 30%

Proportion of service by B to:

- 30% A
- 20%
- 50% D
- 5. Using the algebraic method, department A's cost allocated to department C is:
  - and P48,000: 000,85 beingune Ismans . Was the tolkinding ent the local
  - b. P58,800
  - c. P60,619
  - d. P98,000

- 6. Using the algebraic method, department B's cost allocated to department C is:
  - a. P 7,794
  - b. P13,192
  - c. P14,021
  - d. P29,021

AMR Corp. currently uses a firm-wide overhead application based on expected direct labor hours. The following information is anticipated at the beg. of the year.

2010	Department A	Department B
Direct materials	P 25.00/lb.	P 17.00/lb.
Direct labor hours	10,000	5,000 10,000
Machine hours	2,000	P 85,000
Overhead	P115,000	P 12.00/hr
Labor rate	P 15.00/hr	1 12.00/111

- 7. If the firm maintains the current method, the overhead application rate is:
  - a. P 7.67/hr.
  - b. P11.50/hr.
  - c. P13.33/hr.
  - d. P20.00/hr.
- 8. If departmental rates were adopted, what would be the rates for Departments A (based on direct labor hours) and B (based on machine hours)

1.5	$\mathbf{A}$	В
a.	P 11.50	P 8.50
b.	P 11.50	P 17.00
c.	P 57.50	P 8.50
d.	P 57.50	P 17.50

Sensual Scents, Inc. uses a job-order cost system with machine hours as the overhead base. At the beginning of last year, Sensual estimated 38,000 machine hours and P152,000 of manufacturing overhead costs. For the year, only 37,500 machine hours were logged but P153,500 of overhead cost was incurred.

- 9. What is Sensual's under-or overapplied manufacturing overhead?
  - a. P 1,500 underapplied
  - b. P 1,500 overapplied
  - c. P 2,000 underappld
  - d. P 3,500 underapplied

The following information relates to Donna Corporation for the last year. Donna uses direct labor hours as an overhead base.

Estimated direct labor hours

Estimated manufacturing overhead costs

Actual manufacturing overhead costs

Applied manufacturing overhead costs

Applied manufacturing overhead costs

136,000 hours

P 108,800

108,480

110,000

- 10. What was the actual number of direct labor hours worked last year at Donna?
  - a. 86,784 hours
  - b. 88,320 hours
  - c. 135,600 hours
  - d. 137,500 hours

D'Santos uses a job-order cost system with machine hours as an overhead base. The following information relates to D'Santos for last year:

Estimated machine hours for the year	42,000
Actual machine hours for the year	40,800
Predetermined overhead rate	P 1.50 per MH
Underapplied factory overhead	P 2,600

11. What is the peso amount of the following items?

	Estimated OH	Applied OH	Actual OH
a	P 61,200	P 63,000	P 60,400
b.	P 61,200	63,000	65,600
c.	P 63,000	61,200	58,600
d.	P 63,000	61,200	63,800

Justine Company budgeted total variable overhead costs at P180,000 for the current period. In addition, they budgeted costs for factory rent at P215,000, costs for depreciation of office equipment at P12,000 costs for office rent at P92,000, and costs for depreciation of factory equipment at P 38,000. All these costs were based upon estimated machine hours of 80,000. At the end of the period, the Factory Overhead control account had a balance of P 387,875. Actual machine hours were 74,000.

- 12. What was the over or underapllied factory overhead for the period?
  - a. P 12,650 overapplied
  - b. P 12,650 underapplied
  - c.. P 108,850 overapplied
  - d.. P 108,850 underapplied

Candice Company uses activity-based costing to determine the unit product costs for external reports. The company has two products: Candy A and Candy B. The annual production sales of Candy A is 10,000 units and of Candy B is 4,000 units. There are three overhead activity centers, with estimated overhead costs and expected activity as follows

	A	L 400,411		Expected Acti	vity
	Activity	Est. Overhead	Candy A	Candy B	Total
				100	250
/	Activity 1	25,000	<u> 150</u>	$\frac{100}{200}$	$\frac{1,000}{1,000}$
	Activity 2	65,000	800	2,000	3,000
	Activity 3	90,000	1,000	2,000	5,000

- 13. The overhead cost per unit of Candy A under activity-based costing is
  - a. P6.00
  - b. P9.70
  - c. P1.50
  - d. P3.00

The following information relates to Pure Corporation for the past accounting period.

Service Department	Direct Costs		
A	P80,000	est of track to a Table	
B	60,000		
Producing Department	000 20 1		
C 0	15,000	005.10-9	
D. L	00110 20,000	000,6a7	
Proportion of service by A to:			
В	10%		
	60%		
in send costs of E) \$0,000 for the cr	30%	aprid kutdu	
Proportion of service by B to	hev hadgelod costs.	a eddition. I	parind, li
who had not be the series	30%	on of office w	depresia; ic
month area seen as Quilly (1942)		high to legal i	2517-5-12
and of the pared, the factors Over	50%	and sairting	

- 14.. Using the simultaneous method, Dept. A's allocated to Dept. C is
  - a. P40,000
  - b. P58,800
  - c. P60,619
  - d. P98,000

Marvin Company uses a job costing system and applies overhead to products on the basis of direct labor cost. Job no. 75, the only job in process on January 1, had the following costs assigned as of that date: direct materials, P40,000; direct labor, P80,000; and factory overhead, P120,000. The following selected costs were incurred during the year 2016:

Traceable to jobs:

Direct materials	P 178,000
Direct labor	. 350,000 P523,000
Not traceable to jobs:	1.727,000
Factory materials and supplies	46,000
Indirect labor	235,000
Plant maintenance	73,000
Depreciation on factory equipment	29,000
Other factory costs	76,000 459,000

Marvin's profit plan for the year included budgeted direct labor of P320,000 and factory overhead of P384,000

- 15. Assuming no work-in-process on Dec. 31, Marvin's overhead for the year was
  - a. Pl1,000 over-applied
  - b. P24,000 over-applied
  - c. P39,000 under-applied
  - d. P11,000 under-applied

Candice Corporation produces reusable christmas cards in two departments: Printing and Laminating. These departments are supported by two service departments: Personnel and Maintenance. Personnel uses the number of employees as an allocation base and Maintenance uses machine hours. The expected level of activity for next quarter is shown below:

	No. of employees	Machine hours
Personnel	40	Manager Sheet And a
Maintenance	60	B 1 2 1 2 1 2 1 2 1 2 1 4
Printing	120	60,000
Laminating	180	40,000

Allocations are made in the order shown above. Budgeted costs for next quarter are P93,000 for Personnel and P68,000 for Maintenance.

16. What is the total amount of service cost that should be allocated to the Printing Department under the direct and step method?

neterial d	Direct method	Step method
a	P 68,700	Р 77,070
b	° P 77,070	P 78,000
c.	P 78,000	P 81,100
d	P 78,000	P 77,070

Super Soak produces two types of sponges: Natural and Super-Suds. Both are produced on the same assembly line but are considered separate divisions. The company wants to know how to allocate manufacturing overhead to the products. The relevant data for the possible allocation bases are given below

	Natural	Super-Suds
Materials used	P 40,000	P 25,000
Direct labor hours	20,000	35,000
Direct labor costs	P 100,000	P145,000
Machine hours	6,000	15,000
Output units	25,000	30,000
<del>-</del>		

The company incurred manufacturing overhead of P48,000.

17. Using direct labor hours, how much overhead will be allocated to the Super-Suds

- a.. P 29,544
- b. P 30,545
- c. P 30,455
- d. P 34,054

18. Using machine hours, how much overhead will be allocated to the Natural?

es are made lit the cutter chawn above. Budgere

- a. P 13,714
- b.. P 28,500
- c. P 17,455
- d.. P 34,286

Hackers Corp. accumulated the following information for its two products, A and B.

a that are the second	Product A	Product B	Total
Production volume	2,000	1,000	
Total direct labor hours	5,000	20,000	25,000
Setup cost per batch	P 1,000	P 2,000	(K)
Batch size	100	50	or a second
Total set-up cost incurred	P20,000	P40,000	P60,000
Direct labor hour per unit	2	1	

A traditional costing system would allocate set-up costs on the basis of direct labor hours. An ABC system would trace costs by spreading the cost per batch over the units in a batch.

19. What is the set-up cost per unit of Product A under each costing system?

	Traditional	ABC System
a	P4.80	P10.00
b.	2.40	10.00
c. da a fargy	40.00	200.00
d.	4.80	20.00

A summary of the usage of the service department services by other service departments as well as by the two producing departments is as follows:

		Equipment	Building	Product	ion Dept.
Service Cost Center	Supervision	Maintenance	Occupancy	Dept.1	Dept. 2
Supervision	0	10%	5%	40%	45%
Equipment maint.	0	0	0	45%	55%
Building occurpa	ny 10%	10%	0	35%	45%

Direct costs in the various departments are as follows:

Department	Dit	rect Cost	Label	
Supervision	Ь,	35,000	<b>S</b> 1	
Equipment maintenance	u Pilit	30,000	S2	
Building occupancy		90,000	S3	
Production Dept. No. 1		350,000	P1	
Production Dept. No. 2		450,000	P2	

- 20. If the direct method of allocation is used, how much of the supervision department's cost would be allocated to the building occupancy department? (Start with Building occupancy, then Supervision)
  - a. 0
  - b. P 1,750
  - c. P3,500
  - d. P5.250

- 21. If the direct method of allocation is used, how much of the equipment maintenance costs would be allocated to production department No. 1?
  - a. ()
  - b. P 13,500

HOO 5 3

- c. P 16,500
- d. P 30,000
- 22. If the step method of allocation is used, how much would be allocated from supervision to production department No. 1
  - a. P 14.000
  - b. P 16.471
  - c. P 17,600
  - d. P 18,526
- 23. If the step method of allocation is used, how much would be allocated from supervision to building occupancy?

summerly halfthe usage of the service department

and he od as 'n the two producing department

- a. (
- b. P 1,750
- c. P 2,200
- d. P 2,444

Stargazer Company logged 7,250 machine hours for the month of June. P42,500 was spent for manufacturing overhead and this overhead is allocated on the basis of machine hours. The company operates 5 departments; however, one department was closed for the month of June due to poor market conditions for its product. It was decided that this department (#3) should be allocated a lump sum of P5,000 as its share of June overhead.

- 24. If this policy is followed, how much overhead would be charged to Department 2, which used 1,750 machine hours?
  - a. P 1,207
  - b. P 9,052
  - c. P10,259
  - d. P20,714

Consolidated Magnets, Inc. has 3 plants. Each plant produces identical magnets but uses different manufacturing processes. Each plant sells to different customers, setting its prices. Headquarters' costs total P350,000. Factors that are considered for allocation purposes are as follows:

	<u>Payroll</u>	Unit Volume Peso Volume	<b>Assets</b>
Plant A	P 335,000	15,000 P 500,000 P	300,000
Plant B	450,000	19,000 900,000	600,000
Plant C	<u> 280,000</u>	17,500 750, <u>000</u>	800,000
Totals	P1.065,000		00,000

- 25. What is the amount of headquarters' costs allocated to Plant A if payroll is used as the allocation base?
  - a. P 75,053
  - b. P 92,019
  - c. P 110,094
  - d. P 1,019,357
- 26. What is the amount of headquarters' costs allocated to Plant B if sales volume, in pesos, is used as the allocated base?
  - a. P 81,395
  - b. P 129,126
  - c. P 146,512
  - d. P 268,605

Camille Company has underapplied overhead of P45,000 for the year ended December 31. Before disposition of the underapplied overhead, selected December 31 balances from Camille Company's records are as follows:

Cost of goods sold		P 720,000
Inventories		7
Direct materials		36,000
Work in process	STAL PROPERTY	54,000
Finished goods		90,000

Under Camille's cost accounting system, over or underapplied overhead is allocated to appropriate inventories and cost of goods sold based on year-end balances.

- 27. In its income statement, Camille should report cost of goods sold of
  - a. P 682,500
  - b.. P 684,000
  - c.. P 756,000
  - d. P 757,500

Happy Burger Co. has a commissary that supplies food and other products to its restaurants. It has two service departments, computer services (S1) and administration and maintenance (S2), which support two operating departments, food products (P1) and supplies (P2). As internal auditor, you are checking the procedures for cost allocation and find the following results:

Costs allocated to P1:

P 30,000 from S1

? from S2

Costs allocated to P2:

P 15,000 from S2

? from \$1

Total costs for the two service departments - P 80,000

S2's services are provided as follows:

20% to \$1

50% to P1

30% to P2

- 28. Using direct method of allocating service department costs, compute the total service department costs incurred by S2.
  - a. Zero
  - P 20,625 b.
  - C. P 40,000
  - P 50,000

Porthos Co. has identified an activity cost pool to which it has allocated estimated ovehead of P1,920,000. It has determined the expected use of cost drivers for that activity to be 160,000 inspections. Product W require 40,000 inspections and Product X require 30,000 inspections.

- 29. The overhead assigned to product W is
  - a. P 40,000
  - b. P 640,000
  - c. P 360,000
  - d. P 480,000
- 30. The overhead assigned to product X is
  - a. P 30,000
  - b. P 640,000
  - c. P 480,000
  - d. P 360,000

# ACCOUNTING FOR LABOR

# LEARNING OBJECTIVES

Upon completion of this chapter, you should be able to

- Distinguish between and account for direct and indirect labor as they are used in the production process.
- Identify the three activities involved in accounting for labor.
- Understand the consequences of and be able to account for employee and employer taxes and fringe benefit costs.
- Identify the guaranteed wage and incentive plans that may be used.

Labor is the physical or mental effort expended in manufacturing a product. Labor cost is the price paid for using human resources. The compensation paid to employees who engage in production related activities represents factory labor. The principal labor cost is wages paid to production workers. Wages are payments made on an hourly, daily, or piecework basis. Salaries are fixed payments made regularly for managerial or clerical services. However, in practice, the terms "wages" and salaries are often incorrectly used interchangeably.

Factory payroll costs are divided into - a) direct labor, and b) indirect labor. Direct labor represents payroll costs that are allocated directly to the product and is debited to the work in process account. Indirect labor costs of labor costs incurred for a variety of jobs that are related to the production process but are considered either too remote or too insignificant to be charged directly to production. Indirect labor costs are charged to the factory overhead control account. Included as indirect labor are: salaries and wages of the factory superintendent, supervisors, janitors, clerks, factory accountants, and timekeepers.

# The accounting system of a manufacturer must include the following procedures for recording payroll costs.

- 1. Recording the numbers of hours used in total and by job.
- 2. Recording the quantity produced by the workers.
- 3. Analyzing the hours used by employees to determine how time is to be charged.
- 4. Allocation of payroll costs to jobs and factory overhead accounts.
- 5. Preparation of the payroll, including computation and recording of the employees gross earnings, deductions, and net earnings.

WAGE PLANS
There are different wage plans that are being used by companies. The plan established by management is approved by the union and should comply with regulations of government agencies. Some of these plans are: hourly-rate plan, piece rate plan, and modified wage plan.

Hourly-Rate Plan
Under this plan, a definite rate per hour is set for each employee. The employees' wages are calculated by multiplying the rate per hour by the number of hours worked, wages are calculated by multiplying the rate per hour by the number of hours worked. The hourly-rate plan is simple to use but does not provide incentive for the employee to achieve a high level of productivity. The employee is paid for merely "being on the job."

Piece-Rate Plan
Under a piece-rate plan, earnings are calculated by multiplying the employee's output
by the rate per piece. The plan provides an incentive for the employee to produce
more. However, the employee might sacrifice quality to maximize earnings.

Modified Wage Plan
This plan combines the features of hourly-rate and piece-rate plans. An example of a modified wage plan would be to set a minimum hourly wage that will be paid by the company even if an established quota of production is not attained by an employee. If the established quota is exceeded, an additional payment per piece would be added to the minimum wage level.

#### CONTROLLING LABOR COST

Maintaining labor records is the responsibility of the time-keeping and payroll departments. The time-keeping department accounts for the time spent by the employees in the factory. The payroll department computes each employee's gross earnings, the amount of withholdings and deductions, and the net earnings to be paid to the employee.

The departmental responsibilities of time-keeping and payroll are carried out by completing and maintaining the following forms and records:

Time-keeping
Clock cards
Time tickets
Production reports

Payroll
Payroll records
Employee's earning records
Payroll summaries

# ACCOUNTING FOR LABOR COSTS

For all regular hourly employees, the hours worked should be recorded on a time ticket or individual production report. The time ticket shows the employee's starting and stopping time on each job, the rate of pay, and the amount of earnings. Individual production reports are used instead of time tickets when labor costs are calculated using piece rates. The time tickets and production reports are sent to payroll on a daily basis. The pay rates and gross earnings are entered, and the reports are forwarded to accounting. Cost accountants sort the time tickets and production reports and charge the labor costs to the appropriate jobs or department and factory overhead. The accounting department records the earnings in factory overhead ledger and on the labor cost summary.

The labor cost summary is used as the source for making a general journal entry to distribute payroll to the appropriate accounts. The entry is then posted to the control accounts, Work in Process and Factory Overhead in the general ledger.

In preparing the labor cost summary from the tickets, it is important to separate any overtime from an employee's regular time because the accounting treatment may be different for each type of pay. Regular time worked is charged to job debiting Work in Process. Overtime may be charged to jobs, to factory overhead, or allocated partly to jobs and partly to overhead. Overtime distribution depends upon the conditions creating the need for overtime hours.

If an employee works beyond the regularly scheduled time but the employee is paid at the regular hourly rate, the extra pay is called overtime pay. If an additional rate is allowed for the extra hours worked, the additional rate earned is referred to as overtime premium. The premium pay rate is added to the employee's regular rate for the additional hours worked. The premium rate will depend on the collective bargaining agreement (CBA) between management and the union.

To illustrate how a payroll is calculated where overtime premium is a factor, assume an employee regularly earns P 30 per hour for an 8-hour day. If called upon to work more than 8 hours in a working day, the company will have to pay overtime premium for hours worked in excess of 8 hours. Assuming the employee works 12 hours on Monday, is paid 50% overtime premium (time-and-half) the earnings would be calculated as follows:

Direct labor - 8 hours at P 30

Direct labor - 4 hours at P 30

Factory overhead (overtime premium - 4 x 15)

Total earnings

P 240

P 120

P 420

If the previously mentioned employee is paid a premium of 100% (double the earnings would be:

480 120 Factory overhead (overtime premium-4 x 30) Direct labor - 4 hours at P 30 Direct labor - 8 hours at P 30 Total earnings

overtime premium to the factory overhead account, all jobs worked on during the period share the cost of overtime premiums paid. If the job contract stipulated that it in Process, while the overtime premium (60 in the first illustration and 120 in the second illustration) will be charged to Factory Overhead Control. By charging the was a rush contract, it would be appropriate to charge the premium pay to the job With the preceding illustration, the regular rate (240 + 120) will be charged to Work (Work in Process) instead of to a factory overhead account.

# EMPLOYER'S PAYROLL TAXES

Payroll taxes imposed on employers include social security premiums, pag-ibig fund contributions and philhealth premiums. Employers are responsible for periodically Employers who fail to file require reports or pay taxes due are subject to civil, and in some cases, reporting and paying the taxes to the appropriate government agencies. criminal penalties.

# SSS Contribution

Let us consider the SSS contribution of an employee with a salary of Of the total amount credited to the employee's name approximately 68% (706.70/1040) is paid by the employer and approx. 32% only is deducted from the The Social Security System requires employers to pay social security taxes on wages and salaries equivalent to approximately 55% of the total contribution credited to the P10,000/month. Per the table - Appendix - the total contribution is P925 - P506.70 employee's salary. The benefits to name a few are: pension upon retirement (lump salary, educational loan, maternity leave (with pay), housing loan and sum equivalent to 18 months x the computed monthly pension and on the 19th month and up to the death of the retiree, monthly pension will be credited to the retiree' bank being contributed by the employer and P333.30 deducted from the employee's salary. sometimes calamity loan

#### PhilHealth contributions

The amount contributed by the employer is equal to the amount deducted from the employee's salary or wage. The maximum deduction per table P375.00 for salaries P30,000 and over. The contribution of the employer, maximum, is also P375.00. Benefits are enjoyed when the employee is hospitalized. The amounts reimburseable, allowed by law, are professional fees, room, medicine and other expenses (amount is paid directly to the hospital. For our example – an employee with salary of P10,000, the deduction is P125.00 from the employee's salary and same amount is contributed by the employer. The total amount of P250.00 is credited to the employee's name.

#### Pag-ibig Funds Contribution

The amount deducted from the employee's salary is equivalent to 3% of basic or P100, whichever is lower. The contribution of the employer is also equal to the amount deducted from the employee. Some of the benefits are: educational loan, salary loan, housing loan. Upon retirement, the total amount deducted from the employee's salary plus the contribution of the employer plus dividends earned will be returned to the employee

#### **ILLUSTRATIVE PROBLEM 1**

The Ingrid Manufacturing Company pays employees every two weeks. Monday, May 1, is the beginning of a new payroll period. The following payroll summary is prepared by the payroll department and forwarded to accounting for recording:

Payroll Summary	
for the period May 1-14	
Factory Sales and	
Worker Adm. Employee	Total
Gross Earnings <u>P 10,000.00</u> <u>P.20,000.00</u>	P 30,000,00
Withholdings & deductions:	
Income tax P 1,979.25 P 2,833.33	P 4,812.58
SSS Premiums 333.30 500.00	833.30
PhilHealth contributions 125.00 250.00	375.00
Pag-ibig contributions 100.00 100.00	200.00
Total deductions <u>P 2,537.55</u> <u>P 3,683.33</u>	P6,220.88
Net earnings <u>P 7,462.45</u> <u>P 16,316.67</u>	P23,779.12

After the data are verified, a payroll voucher is authorized and recorded as follows:

May 14	Payroll P 30,000	4.010.50
rriay 14		4,812.58
	Withholding Tax payable	833.30
	SSS Premium Payable	375.00
	PhilHealth Contributions Payable	200.00
	Pag-ibig Funds Contributions Payable	23,779.12
	Vouchers Payable	7 TO 1 TO 1

To record the payment of the net earnings to employees, the following entry is required:

May 14 Vouchers Payable

Cash

P 23,779.12

P 23,779.12

Assuming that of the total factory payroll of P10,000 - P3,000 is indirect labor, the entry to record the distribution of the payroll is:

Work in Process
P 7,000
Factory Overhead Control 3,000
Selling & Adm. Expense Control 20,000
Payroll P 30,000

The following schedule provides the information necessary to record the employer's payroll taxes for the period.

to the second se	SSS Premiums	PhilHealth	Pag-ibig	Total
Factory payroll	706.70	125	100	93170
Selling & Adm.	<u>1,060.00</u>	<u>125</u>	<u>100</u>	1,285.00
Total	<u>1,766.70</u>	250	200	2,216.70

The entry to record the employer's payroll taxes is as follows:

Selling & Adm. Expense Control 1 285 00	
Setting & Adm. Expense Control 1,285.00	
SSS Premiums Payable P 1.766	70
PhilHealth Contributions payable 250 i	
Pag-ibig Funds Contributions Payable 200.0	

#### **CLASSIFICATION FOR LABOR**

1. Direct labor - labor identified with particular products which is considered feasible to be measured and charged to specific production order cost sheet

#### 2. Indirect labor

a. Labor identified with particular products but which is not considered feasible to measure and charge to a specific production order.

b. Labor expected for the benefit of production in general and not identified with

particular products.

#### 3. Labor Overhead

a.. Waiting time or idle time - cost of non-productive hours of direct labor caused by lack of work, waiting for materials delays from scheduling, machine breakdown and machine set-up.. For example, when a new job is being "set-up" for production, some workers may temporarily have nothing to do If their idleness is normal for the production and cannot be avoided the cost idle time should be charged to factory control. Let us assume Maxinc Garcia spent 36 hours on Job 101 and was idle for 4 hours during the week Maxine's rate is P50.00 per hour for a 40-hour week, as per union contract. The following entry should be made to record Maxine's total wages.

> Work in process Job 101 (36 hrs. x P 50) 1.800 Factory overhead control - Idle time (4 hrs. x P50) 200 Accrued payroll 2.000

b. Make-up pay - When payments to an employee are based solely on the number of units produced, the employee is said to be paid at a "piecework" rate. Many companies will pay employees a minimum wage but they can earn more if they produced more. This labor payment system benefits new employees because it guarantees them a minimum salary while they are learning their new job (during which time they usually do not produce enough units). If the output multiplied by the piece rate results in an amount less than the guaranteed wage, the difference is charged to factory overhead control. If the output multiplied by the piece rate results in an amount greater than the guaranteed wage, the employee is paid the amount earned. Let us assume Maxine Garcia is paid P15.00 per piece produced and during the week she produced 80 pieces. If the guaranteed weekly pay is P1,500, then the difference between P 1,500 (guaranteed pay) and P1,200 (actual pay) is charged to factory overhead control. The entry to record Maxine's pay is

> Work in process - Job 101 1,200 Factory overhead control. - Make-up pay 300 Accrued payroll 1.500

If Maxine, in the previous illustration ) is guaranteed a weekly pay of P1,000, then the entry will be

Work in process - Job 101 (80 x P15) 1.200 Accrued payroll

1.200

c. Overtime premium – represents amount paid, in excess of regular rate, to employees working in excess of 8 hours in a day, or working during holidays or their rest day. Regular earnings represent the total hours worked, holidays overtime hours, by the regular rate. Overtime premium represents including overtime hours, by the regular rate. The premium rate for the overtime hours multiplied by the premium rate. The premium rate for overtime is usually some fraction of the regular rate. For example if Maxine worked for 45 hours during the week and she paid time ad a half then the entry will be

Work in process (45 hours x P 50)

Factory overhead control (5 hours x P 25)

Accrued payroll

2.250

125

2,375

If overtime results from the requirements of a specific job and not from random scheduling the overtime premium should be charged to the specific job that caused the overtime. For example, if the overtime worked by Maxine was caused by a rush order and the customer has agreed to pay for the special service, then the premium will be debited to work in process instead of factory overhead control

d. Shift premium - extra pay to work during less desirable evening shift (2 pm to 10 pm) or night shift (10 pm to 6 am). This shift premium, or shift differential, should be charged to factory overhead control rather than work in process. Assume that Maxine is assigned to night shift and is paid a shift premium of P20 per hour, the entry for her pay will be

Work in process (40 hours x P 50)

Factory overhead control (40 hours x P 20)

Accrued payroll

2,000

800

2,800

e. Employers' payroll taxes – amounts remitted to differenct government agencies for SSS premiums, PhilHealth contributions, and Pag-ibig contributions.

# GROSS EARNINGS OF EMPLOYEES

- 1. Wages gross earnings of an employee who is paid by the hour for only the actual hours worked.
- 2. Salaries gross earnings of an employee who is paid a flat amount per week or month regardless of the hours worked in a period.
- 3. Gross earnings the compensation of an employee and includes regular pay and overtime premiums.

#### PAYROLL DEDUCTIONS

- 1. Employee's income tax the amount of tax to be withheld each period depends on the following:
  - a. Amount of the employee's earnings.
  - b. Frequency of the payroll period, and
  - c. Classification of the taxpayer and number of qualified dependents.
- 2. Social Security System premiums levied against both the employer and the employee (based on table provided).
- 3. PhilHealth Contributions levied against both the employee in equal amounts (based on table provided).
- 4. Pag-ibig Contributions levied against both the employer and the employee in equal amounts (based on table provided)

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TRUE	- FA	ALSE QUESTIONS
Indicate space a c	whe apita	ther the following statements are true or false by inserting in the blank al "T" for true or "F" for false.
	_1.	In ideal circumstances, each payroll check is delivered personally to the employee who signs a receipt for it.
	2.	The amount of income taxes withheld from employee gross pay is an expense to the employer.
ति क्षाम्बद्धाः	_3.	An entry is made debiting Accrued Payroll and crediting Cash when payroll checks drawn against a payroll checking account are issued.
	4.	To better provide for a good division of labor, one individual should be in charge of time keeping and payroll record keeping and distribution functions.
	<b>5.</b>	To avoid congestion at the time clock, it is desirable that one employee punch in or out for several other employees.
of the	6.	Remuneration for manual labor, both skilled and unskilled, is commonly referred to as salaries.
	7.	Total factory labor cost is composed of direct labor and indirect labor.
	8.	Direct labor cost is recorded by a debit to Work in Process account.
ા કહ્યુંલીલ 	<b>9</b> .	Payroll deductions are based on the gross earnings of the employee (regular earnings plus overtime pay).
	10.	The amount debited to the Work in Process account represents the total amount of direct labor (at regular rate) charged to the different jobs in process.

## **PROBLEMS**

#### Problem 1

The Evergreen Company produces tools on a job order basis. During May, two jobs were completed, and the following costs were incurred:

·	,	Job 401		Job 402
Direct materials		P 28,000		P 37,000
Direct labor - regular		18,000		23,000
overtime premium		100 Sec. 30.	orly No	6,000

Other factory costs for the month totaled P 16,800. Factory overhead costs are allocated one-third to Job 401 and two-thirds to Job 402. Required:

- a) Describe two alternative methods of recording the overtime premium and explain how the appropriate method affect the cost of each job.
- b) Compute the cost of Job 401 and Job 402 under each of the two methods.

#### Problem 2

A weekly payroll summary made from time tickets shows the following data:

	Exemption	1.9		Number	of Hours
Employee	Status	Classification	Rate/Hour	Regular	Overtime
Austria, B.	S	Direct	P 36	40	2
Bautista, D.	ME	Direct	36	40	3
De Santos, M.	ME-2	Direct	45	40	4
Motus, R.	HF - 4	Indirect	30	40	5.1
Reyes, A.	HF	Indirect	30	40	

Overtime is payable at one-and-a-half times the regular rate of pay for an employee.

#### Required

- a) Determine the net pay for each employee.
- b) Prepare journal entries for:
  - 1. recording the payroll.
  - 2. payment of the payroll.
  - 3. distribution of the payroll..
  - 4. the employer's payroll taxes.

#### Problem 3

The Norman Company recently adopted an incentive plan. Factory workers are paid P7.50 per unit with a guaranteed minimum wage of P2,000 per week Following is a report on employees' productivity for the week ending May 19, 2019. All employees worked the full 40-hour week.

EMPLOYEE'S NAME UNITS PRODUCED					
DUCED					

#### Required:

1. Compute each employee's gross pay

2. What amount should be charged to work in process?

3. What amount should be charged to factory overhead control?

#### Problem 4

A rush order was accepted by the Ty-Nee Trailer Company for five trailers. The time tickets and clock cards for the week ended March 27 show the following:

			_	Time Tickets - Hour distribution				
	Exemption		Previous	Trailer	Trailer	Trailer	Trailer	Trailer
<b>Employees</b>	Status Ho	ours	<b>Earmings</b>	<u>#1</u>	#2	<u>#3</u>	<u>#4</u>	<u>#5</u>
Castro	S	42	P5,600		all time s	pent superv	ising	
Ardina	ME3	45	7,500	10	10	10	10	5
Briones	ME	48	6,500	24	24			
David	S	48	6.200			24	24	
Fajardo	ME	45	5,900	15	15			15
Tomas	ME1	42	5,800	24	8			
Villas	ME	40	5,200			20	10	

All employees are paid P40 per hour, except Ardina, who receives P50 per hour. All overtime premium pay except Ardina's is chargeable to the job and all employees, including Ardina, received time and a half for overtime hours. The previous earnings were not subjected to deductions, such payroll deductions are made on the last pay for the month

#### Required

- 1. Calculate the total payroll and total net earnings for the week. Hours not worked on trailers are charged to factory overhead.
- 2. Prepare entries to record, pay, and distribute the payroll.

## MULTIPLE CHOICE QUESTIONS

- 1. Employers are required to prepare W-2 forms for every employee at the end for the calendar year. These forms are used by the employee for:
  - a. filing for social security benefits when retired.
  - b. filing an income tax return every year.
  - c. filing for unemployment benefits when unemployed.
  - d. determining how much income tax to withhold from an employee's earnings for each pay period next year.
- 2. The employer's portion of SSS premiums is:
  - a. an expense for the employee.
  - b. an expense for the employer.
  - C. a revenue for the employee.
  - d. a revenue for the employer.
- 3. Income taxes withheld are levied on the
  - a. employee only.
  - b. employer only.
  - c. both employee and employer in equal amounts.
  - d. both employee and employer in unequal amounts.
- 4. "Take home pay" or net pay means
  - a. gross pay plus the amount paid for you by your employer for SSS premiums and Medicare Contributions.
  - b. gross pay less all deductions.
  - c. the mount earned per hour times number of hours worked.
  - d. gross pay less only income tax withheld.
- 5. Which of the following deductions are not levied on the employer?
  - a. Income taxes withheld.
  - b. SSS premiums.
  - C. Medicare contributions.
  - d. none of the given.

- 6. Which of the following is usually prepared daily by employees for each job worked on?
  - a. Labor time ticket
  - b. Time card
  - C. Punch card
  - d. Cost control card
- 7. Factory workers fringe benefits are usually charged to
  - a. Work in process account
  - b. Direct labor
  - c. Administrative expense
  - d. Factory overhead control
- 8. Idle time of factory workers is usually charged to
  - a. Work in process account
  - b. Direct labor
  - c. Administrative expense
  - d. Factory overhead control
- 9. Overtime premium, incurred on rush jobs as requested by the customer, who has agreed to pa for the special service, may be charged to
  - a. Work in process account
  - b. Direct labor
  - c. Administrative expense
  - d. Factory overhead control
- 10. Fringe benefits of sales personnel is usuall charged to
  - a.. Work in process account
  - b. Administrative expense
  - c.. Selling expense
  - d.. Factory overhead control

Twenty workers, paid at a wage rate of P10.50 per hour, worked 40 hours each, entirely Job 1010 during the past week. Eight other who are paid at a wage rate of p7.50 per hour, spent half of their 40-hour week on Job 1010 and the remainder of their time on Job 1011. In addition, Kyle Motus, a part-timer, worked on Job 1010 for 16 hours but was unable to work 4 hours because of the inefficiency of his fellow workers in a prior stage. Kyle earns P9.25 per hour. Salaries for supervisors and maintenance personnel related to Job 1010 and 1011 amounted to P1,250.

11. Assuming that payroll withholdings are ignored and Jobs 1010 and 1011 are the only jobs being performed, what is the entry to record labor cost?

a. Work in process inventory- Job 1010 Work in process inventory- Job 1011	10,373 1,825
Factory overhead control Payroll payable	37 12,235
b. Work in process inventory- Job 1010 Work in process inventory- Job 1011 Factory overhead control Payroll payable	9,748 1,200 1,287 12,235
c. Work in process inventory- Job 1010 Work in process inventory- Job 1011 Factory overhead control Loss Payroll payable	9,748 1,200 37 1,250
d. Work in process inventory- Job 1010 Work in process inventory- Job 1011 Factory overhead control Payroll payable	10,998 1,200 37 12,235

F & B Company pays time and a half for hours in excess of 40 hours per week. An individual is paid P24.00 per hour and worked 44 hours a week.

12.. The weekly earnings of the employee will amount to

- a.. P 960
- b.. P 1,032
- C. P 1,104
- d.. P 1,036

Transfer	the follow	ving information		
Escudero	Manufacturing Co. has provided you with the follow	P	135,000	
	Raw materials purchased		100,000	
	Beginning raw materials inventory		175,000	
A. Maria	Ending raw materials inventory			
	Factory overhead (including P85,000 of indirect	de de	227,500	
2.34	labor and P 20,000 of indirect materials)		960,000	
4.16	Total manufacturing cost		, , , , , ,	

. 13. Direct labor cost for the year amounted to

a P 677,500

b. P 382,500

C.. P 642,500

d. P 692,500

Ronald Factory provides for an incentive scheme for its factory workers which features a combined minimum guaranteed wage of P875 per week and piece rate of P11.25. Production report for the week show.

Employee	Units produced		
R	67		
0	78		
L	80		
$\mathbf{A}$	82		
N	72		
<b>D</b>	75		

- 14. The portion of the weekly payroll that should be charged to factory overhead is
  - a. P5,325.00
  - b. P5,275.00
  - c. P5,217.50
  - d. P 217.50

Litton Mfg. Co. pays their employees on a combined minimum rate and piecework rate plan. The minimum guaranteed daily wage is P420. Any employee who produces more than 10 shirts receives a bonus.

- 15 If Mr. Unson produced 14 shirts, what amount should be charged to factory overhead control?.
  - a.. 0
  - b. P 88
  - c. P 268
  - d.. P 168

# PROCESS COSTING

#### LEARNING OBJECTIVES

Upon completion of this chapter, you should be able to

- Define process costing and differentiate from job order costing
- Define the characteristics of a process cost system
- Compute for the equivalent production
- Discuss and prepare a cost of production repor

t

The basic purpose of cost accounting is the accumulation of data designed to provide management with accurate information on the cost of manufacturing a product. The appropriate cost accounting system for a particular entity depends on the nature of manufacturing operations.

When a manufacturing process involves the continuous production of identical units rather than distinguishable job lots, there can be no job orientation. When there is no obvious start or finish (because the manufacturing process is endlessly repetitive), we use a process-costing system to accumulate and allocate manufacturing costs. In using process costing, all manufacturing costs are allocated first to departments or processes. Departmental or process costs are then allocated to units of product as units are completed. Instead of using job-cost sheets, the costs associated with each department are summarized on a cost-of-productions report, with one report per department for a period of time. At the end of each period, the costs accumulated on each such report will be allocated between end-of-period work in process and units transferred to the next process, or, in the case of the final process, to finished goods.

A process cost system determines how manufacturing costs incurred during each period will be allocated. The allocation of costs within a department is only an information step, the ultimate goal is to compute total cost per unit for income determination. During a period some units will be started but will not be completed by the end of the period. Consequently each department must determine how much of the total costs incurred by the department is distributed to units still in process and how much is attributable to completed units.

PROCESS COSTING METHODS ARE USED BY THE FOLLOWING: 1. Industries producing chemicals, petroleum, textiles, steel, rubber, cement,

flour, pharmaceuticals, shoes, plastics, sugar, and coal.

2. Firms manufacturing items such as rivets, screws, bolts, and small electrical 3. Assembly-type industry which manufactures typewriters, automobiles,

airplanes, and household electric appliances.

4. Service industries such as gas, water, and heat.

# CHARACTERISTICS OF A PROCESS COST SYSTEM

Costs are accumulated by department or cost center

Each department has its own general ledger Work in Process Inventory account This account is debited with the processing costs incurred by the department and 2. credited with the cost of completed units transferred to another department or to finished goods inventory.

Equivalent units are used to restate - work in process inventory to terms of 3.

completed units at the end of a period.

Completed units and their corresponding costs are transferred to the last department or to finished goods inventory. By the time units leave the last processing department, total costs for the period have been accumulated and can be used to determine the unit cost of each and total finished goods.

Total costs and unit costs for each department are periodically calculated and

analyzed with the use of department cost of production report.

# COMPARISON OF JOB ORDER COSTING AND PROCESS COSTING

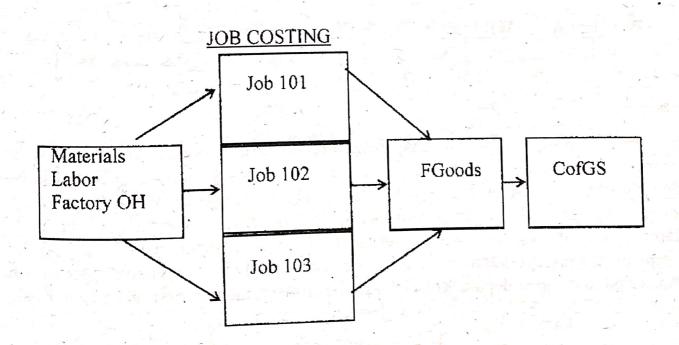
A job order cost accumulation system is most suitable when a single production of batch or products is manufactured according to a customer's specifications. A process cost accumulation system is used when products are manufactured by eith mass production techniques or continuous processing. Process costing is suitable when homogeneous products are manufactured in large volume A customized cabinet manufacturer would use a job order cost system whereas a manufacturer of 8-ounce jars of peanut butter would use a process cost system.

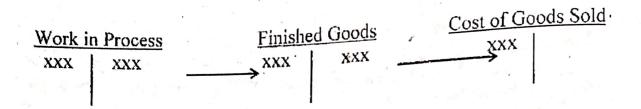
Under a job order cost accumulation system, the three elements of a product's cost (direct materials, direct labor, and factory overhead are accumulated according to

identifiable jobs. Individual work in process inventory subsidiary cost sheets are set up for each and are charged with the cost incurred in the production of the specifically ordered units. Upon completion of each job, its cost is transferred from work in process to finished goods inventory.

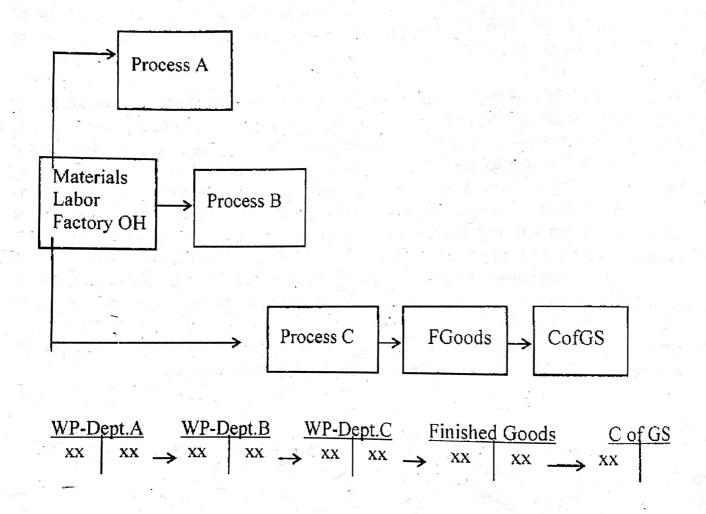
Under a process cost system, the three basic elements of a product's cost are accumulated according to department or cost center. Individual work in process inventory accounts are set up for each department and are charged with the costs incurred in the processing of the units that pass through them. Upon completion of the process, the cost of work in process inventory in the last department is transferred to finished goods inventory.

As enumerated in Chapter 1, there are four major differences between process costing and job order costing. Both require accumulating the costs of goods and services. But a key difference occurs in computing unit costs. The unit cost of a product results from dividing the accumulated cost by a measure of volume. The denominator under job order costing is the actual units while under process costing, it is the equivalent units of production. Equivalent unit refers to the amount of work actually performed on products with varying degrees of completion, translated to that work required to complete an equal number of whole units. Another key difference is the time of computing the unit cost. Under job order costing the unit cost is computed upon the completion of the job. The job may be completed on the first week of the month, second week, third week. Or last week of the month. The total costs of the jobs remaining uncompleted will be the work in process inventory, end. Under process costing the unit cost is computed at the end of the month.





# PROCESS COSTING



In a process system, a product may flow through several operations on its way to completion. Materials may be started in Dept. A. Both the units and costs will be identified for Dept. A over a period of time, such as a month. When the units are completed in Dept. A, the units with their costs are transferred to the next operation, Dept. B. Additional costs will be incurred and accounted for in Dept. B. At the completion of the operations in Dept. B, the units with their accumulated costs will be transferred to the next department. In each department, the unit cost will be computed

by dividing costs incurred by the equivalent production in the department. Under job order costing, the equivalent production is not being used because all units in the job share in the cost equally. Under process costing, some units are still in process at the as the completed.

# PRODUCTION BY DEPARTMENT

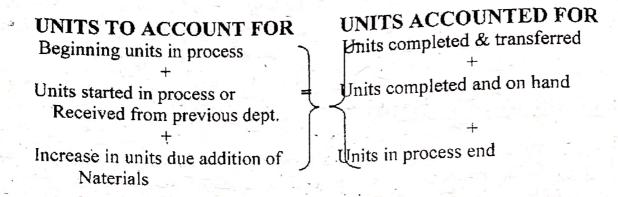
In a process cost system, when units are completed in one department, they are transferred to the next processing department accompanied by their corresponding costs. A compete unit of one department becomes the raw materials of the next department until the units reach finished goods. Thus the output of Department 1 becomes the input of Department 2. Department 2 receives both the units produced by Department 1 and the costs carried by such units. When Department 2 completes its processing, it transfers out the units and the costs it received from Department 1 plus any cost it incurred while working on the units. The costs of a unit grow larger as it progresses along the assembly line from one department to the next. For example, Sunbloc manufactures chairs and uses three departments to produce one chair. Department 1 cuts and cleans the wood at an average cost of P 45.00 per unit. The wood are then moved to Department 2, where they are assembled and put together at an average cost of P 15.00. The next stop is Department 3, where they are painted at an average cost of P 25.00 per unit. The completed chairs are transferred from Department 3 to finished goods inventory. The total unit cost of one finished chair is P 85.00, computed as follows:

Department 1	P 45.00
Department 2	15.00
Department 3	25.00
Total unit cost added	P 85.00

Generally, the cost per unit increases as units flow through each department. The unit cost can decrease when units pass through a department if volume is added to the product.

SYSTEM FLOW

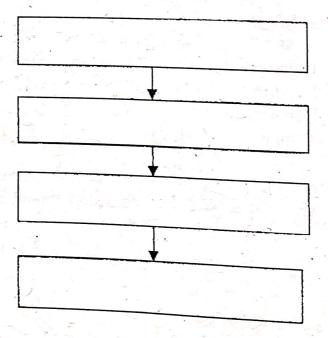
The following Units and costs flow together through a process cost system, equation summarizes the physical flow of units in a department.



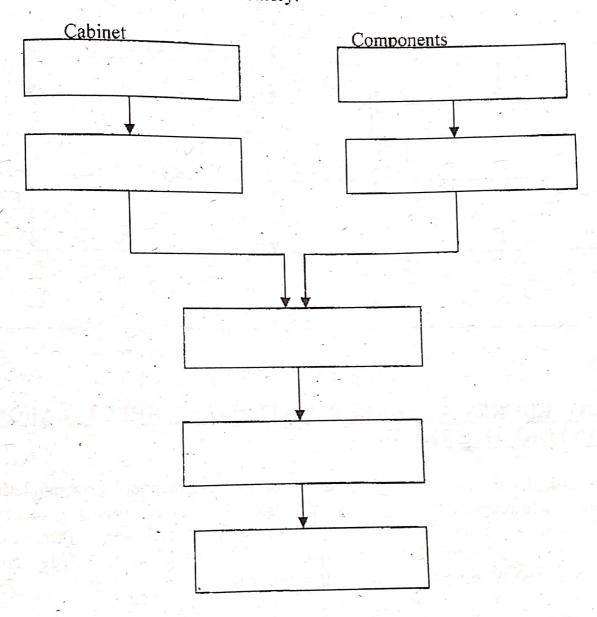
#### PRODUCT FLOW

A product can flow through a factory in three different ways. These product flow formats associated with process costing are:

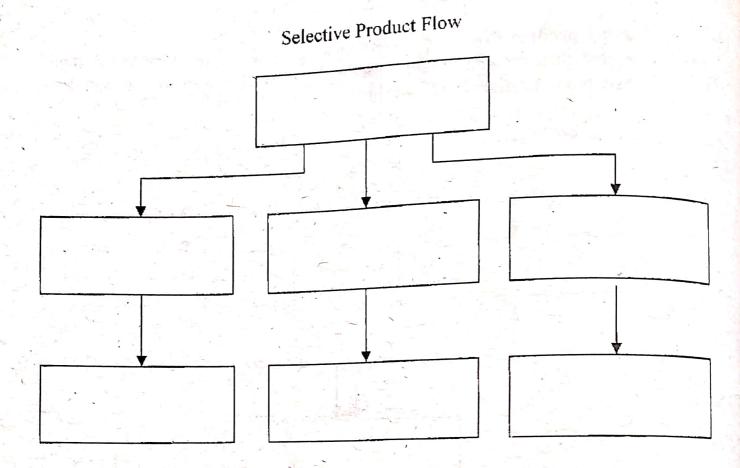
1. Sequential product flow - in a sequential product flow, the initial raw materials are placed into process in the first department and flow through every department in the factory. Additional materials may or may ot be added in the subsequent departments. All items purchased go through the same processes in the same sequence. A flowchart presentation of sequential product flow is presented below...



2. Parallel product flow - certain portions of the work are done at the same time and then brought together for the final process and upon completion transferred to finished goods inventory.



3. Selective - the product moves to different departments within the factory, depending upon the desired final product. Several products are produced from the same initial raw materials



# PROCEDURES - DIRECT MATERIALS, DIRECT LABOR AND FACTORY OVERHEAD

The use of a process cost system does not alter the manner of accumulating direct materials, direct labor and factory overhead costs. The normal procedures of cost accounting are used to accumulate the three product cost elements. Process costing is concerned however with the assignment of these costs to the appropriate departmental Work in Process Inventory account.

#### **DIRECT MATERIALS**

The entry to record the issuance of direct materials to Department 1 during the period is as follows

Work in Process – Department 1
Materials

XXXXX

XXXXX

Direct materials are always added in the first processing department, but they are also usually added in other departments. The journal entry would be the same for adding direct material cost in later processing departments. The accumulation of direct material cost is much simpler in a process cost system than in a job order cost system. Fewer journal entries are generally required under process cost system. The number of departments using direct materials is usually less than the number of jobs requiring direct materials in a job order cost accumulation system

#### DIRECT LABOR

The entry to distribute direct labor costs is as follows:

Work in process - L	Department 1	xxxxx
Work in process - L	Department 2	xxxxx
Work in process - L	Department 3	xxxxx
Payroll		xxxxx

The amounts to be charged to each department are determined by the gross earnings of the employees assigned to each department. Assuming Maxine, in our preveious examples, works in Department C, her gross salary is charged to Department B. Under a job order cost system Maxine Garcia's would have to be distributed among all the jobs she worked. Process costing reduces the amount of paperwork needed to assign labor costs.

#### **FACTORY OVERHEAD**

In a process cost system, factory overhead costs maybe applied using either of the following two methods. The first method, which is similar to that used in job order costing, applies factory overhead to work-in-process inventory at a predetermined application rate. A predetermined factory overhead application rate based on normal capacity is appropriate when production volume or factory overhead costs fluctuate substantially from month to month, as it eliminates distortion in monthly unit costs caused by such fluctuations.

Work in process inventory - Department 1	· xxx	
Work in process inventory - Department 2	xxx	
Work in process inventory - Department 3	xxx	
Factory overhead applied		xxx

The second method charges actual factory costs incurred to work in process inventory. In the event that production volume and factory overhead costs remain relatively constant from month to month, expected capacity is appropriate as the denominator activity level. In a process cost system, where there is continuous production, either method maybe used.

#### THE COST OF PRODUCTION REPORT

The cost of production report is an analysis of the activity in the department or cost center for the period. All costs chargeable to a department or cost center are presented according to cost elements.

Total and unit costs are determined and summarized on a cost of production report. Either each cost center or department makes such a report, or the individual reports of several departments are summarized. There are a number of useful formats in preparing the cost of production report. However, only one format is illustrated in this book Regardless of the format used, the important thing to emphasize is that process costing requires an orderly approach to assigning costs to products. The following steps provide a uniform approach in preparing the cost of production report.

#### Step 1 - The Quantity Schedule

This schedule accounts for the physical flow of units into and out of departments. All units started in the department must be accounted for and also the disposition of these units, that is, whether they are transferred to the next department, lost, or remain in the department (complete or incomplete). This schedule is concerned only with whole units, regardless of their stages of completion.

#### Step 2 - Calculate Equivalent Units and unit costs

The concept of equivalent production is basic to process costing. In most cases, not all units are completed during the period. Thus, there are units still in process at varying stages of completion at the end of the period. All units must be expressed in terms of completed units in order to determine unit costs. Equivalent production equals total units completed plus incomplete units restated in terms of completed units. Completed units do not create a problem when equivalent production is computed because they are always 100% complete as to direct materials, direct labor, and factory overhead. The problem lies in the restatement of incomplete units in terms of completed units. Incomplete units are accounted for in work in process inventory

until they are completed and transferred to finished goods inventory. Therefore, to compute equivalent production, an analysis must be made of the stage of completion of work in process inventory, subdivided into direct materials, direct labor, and factory overhead. For example, direct materials maybe added at one specific point in production, such as at the beginning or at the end of the process. If direct materials are added at the beginning, all work in process units will have complete direct material cost. When direct materials are added at the end of the process, work in process inventory will not have any direct materials from that department. Direct materials may also be added continuously; in this case the work in process inventory will have direct materials equal to the stage of completion of the work in process. The unit cost in the department is computed by dividing the cost incurred in the department, for each element, by the equivalent production. The formula is:

## FIRST-IN FIRST-OUT METHOD

Equivalent unit cost = Costs added during the period/Equivalent Units (Work done this period)

### WEIGHTED AVERAGE METHOD

Equivalent Unit Cost = (Cost last period plus cost added this period)/Equivalent Units (Work done last period plus work done this period)

# Step 3 – Determine the costs to be accounted for (costs charged to the department)

The cost that a department is responsible for may come from several sources. For one thing, there maybe some units in beginning inventory that maybe partially complete; and the costs of direct materials, direct labor, and factory overhead that were assigned to these units last period will become the cost of the beginning inventory and must be accounted for. Also, if the department is not the first department in the production process, it will receive costs from other departments when the units from these departments are received in its operations. In addition, each department will incur direct materials, direct labor and factory overhead in its own processing. The total of these costs must be determined so that they can be accounted for.

### Step 4 – Account for all costs

After the costs for which the department is responsible for are determined, an accounting for the disposition of these costs must be made. Some of the costs are assigned to cost centers receiving units transferred out of the department. The remaining costs are assigned to the units remaining in the department and, in some cases, to any units lost.

# METHODS OF COSTING UNDER PROCESS COSTING

1. FIFO Method - under this method there is an assumed flow of manufacturing operations and as such it is considered that those units which are first placed in process are presumed to be the first ones completed and those that are first completed are the ones transferred out.

#### Characteristics:

The work in process beginning in the department will require a separate computation for its equivalent production.

2. The units started, completed and transferred will have its own

computation for equivalent production.

Weighted Average Method - under this method, there is no assumed flow of 2. manufacturing operations. It involves the merging of the departmental costs, by elements, of the initial work in process inventory with the costs incurred in the current month and securing a representative average unit costs by dividing the total element of costs by the equivalent production based upon the sum of the units in the initial work in process inventory and the units placed into production during the period.

#### Characteristics:

1. In the computation of the equivalent production, the stage of completion of the work in process beginning is ignored and the total units completed and transferred during the period is considered to have 100% completion.

#### OF APPLICATION **METHODS** OF ELEMENTS **COST** OF TO **PRODUCTION**

- 1. Even application under this method, it is considered that at any stage during the process of production, the introduction of the three elements of cost are equal with one another. Only one computation of equivalent production should be made.
- 2. Uneven application under this method, the introduction of the elements of cost to production varies at any stage of the process, hence, there should be as many computations of equivalent as the elements of cost that are unevenly applied.

# COMPUTATION OF EQUIVALENT PRODUCTION

1. Units received from preceding department Units completed and transferred	10,000 units 8,000 units
Units in process, end (60% completed)	7 000 units
Materials are added 100% at the beginning of the process	

SOLUTION:		Materials	Labor & Overhead	y
	Actual	Work done El	P Work done EP	
Units received	10,000	*1 (1)		
Units completed -	8,000	. 100% 8,0	000 100% 8,000	)
Units in process	2,000	100% 2,0	1 00	<u>)</u>
	10,000	10,0		1

Since materials are added at the beginning of process, then all units started during the period will get 100% materials. The percentage of completion is always the work done for labor and sometimes overhead.

2. Same data as in No. 1 except this time materials are added 100% at the end of the process in the department.

		Materia	<u>ls Lal</u>	oor & Overhea	<u>.d</u>
	Actual	Work done	<u>EP</u>	Work done	<u>EP</u>
Units received	10,000				
Units completed	8,000	100%	8,000	100%	8,000
Units in process	2,000			60%	1,200
	10,000	CONTRACTOR DE LA CONTRA	<u>8,000</u> ·	tarian in a	9,200

In this department, the units will get the materials upon reaching the end of the process in the department. The units in process at the end are only 60%, hence no materials were added to these units.

3. Same data as in No. 1, except this time, materials are added 50% at the beginning of the process and the remaining 50% when the units are 40% completed.

	( ) ,	Materia	<u>lls</u> EP	Labor & Overl Work done	<u>1ead</u> EP
	Actual	Work done	EI	10 it = 111	
Units received	10,000				
Units completed	8,000	100%	8,000	100%	8,000
Units in process	2,000	. 100%	2,000	60%	1,200
	10,000		10,000		<u>9,200</u>

The units in process at the end are 60% completed, therefore the units have passed the second addition of materials which is done at 40% stage of completion.

4. Same data as in No. 1 except this time, materials are added as follows:

50% at the beginning of the process

30% when the units are 20% complete

20% at the end of the process

ed to he will	Actual	Material Work done	<u>s La</u> <u>EP</u>	abor & Overhea Work done	<u>d</u> <u>EP</u>
Units received	10,000	E Walk			
Units completed Units in process	8,000 2,000 10,000	100% 80%	8,000 1,600 9,600	100% 60%	8,000 1,200 9,200

In this department, materials are added 50% at the beginning, so the in process end will get the first 50%, the second addition is at 20% stage of completion and because the units in process end are 60% it means they have passed the second addition of materials and this will make their materials 80% complete.

# ILLUSTRATIVE PROBLEM 1

The following data were taken from the books of Michelle Co. for the month of June,

Units .	<u>Department I</u>	Department 2
Started Completed & transferred In process, end Stage of completion Costs	25,000 20,000 5,000 40%	18,000 2,000 50%
Materials Labor Overhead	P 100,000 66,000 44,000	P 54,000 38,000 19,000

In Department 1, materials are added at the beginning of the process while in Department 2, materials are added at the end of the process.

# MICHELLE CO. COST OF PRODUCTION REPORT

for the month of June, 2019
(Department 1)

		(D	epartment	[1]		
			Mat	erials	Labor & C	Overhead
	Quantity Schedule	Actual	<u>WD</u>	EP	WD	EP -
	Units started	25,000		/ · · /	in the part of the	
	Units completed	20,000	100%	20,000	100%	20,000
	Units in process, end	5,000	100%	5,000	40%	2,000
		25,000		25,000	C - ijer-	$\frac{2,000}{22,000}$
	Cost charged to the dep	partment			10.1.2	<u>##,000</u>
	Cost added in the depart	rtment			Davide Se	r. Dan Hesta
	Materials		P 100,00	00	P 4.00	
	Labor		66,00	0	3.00	in county to
	Overhead	landor.	44,00	0	2.00	
,	Total added	or new supprise	210,00	0	9.00	
	Total cost to be accoun	ted for	P 210,00	00	P 9.00	
	Cost accounted for as for	ollows:			1	
	Completed & transferre	$\frac{1}{20,000 \times 9}$		3.5		P 180,000
	In process, end			-,		1 100,000
	Materials (5,000 x	4)		Р	20,000	
	Labor (2,000 x 3)	die it ben			6,000	white the second
	Overhead (2,000 x	(2)			4,000	30,000
	Total costs as accounted					P 210,000
		7.77				1 410,000

(Department 2)

	(Depart	(1110111-			7.00
Description of the second			16	Labor & C	verhead
		Materia	EP	WP	EP
Quantity Schedule	Actual	<u>WP</u>	쁘		
Units received	<u>20,000</u>				
The state of the s	4 1	1000/	18,000	100%	18.000
Units completed	18,000	100%	10,000	50%	1,000
Units in process	2,000		18,000		19,000
	<u>20,000</u>	2	10,000		Vita vin Acco
Cost charged to the de		D 100 00	nn P	9.00	
Cost from precedi		P 180,00	<u> </u>	<u> </u>	Service Services
Cost added in the	department	54.00	0	3.00	S der Lie
Materials	17 15 15 15 15	54,00		2.00	
Labor		38,00			
Overhead		19,000	_	1.00	
Total added		111.00	_	6.00	
Total cost as acco	ounted for	P 291,00	<u>0</u> <u>P</u>	15.00	
Cost accounted for as			11	n	270.000
Completed & train	nsferred (18,000 x 1	15)		P	270,000
In process, end					
	receding (2,000 x 9	)	P 18,0	000	Bara Darie
Materials		14		11/4-16	
Labor (1,00	$0 \times 2$		2,0	000	
Overhead (1	$,000 \times 1)$		1,(	000	21,000
Total cost as acco	ounted for			P	291,000
	era, in the second	Mark The			
Computation of unit of	ost:	30			
Department		D	epartme	nt 2	See you will be
Materials = 100,		1aterials =			silba-ss F
	4.00		6 × 9	= 3.00	
				3.00	yal *Timor nadis
Labor =	66,000/22,000	- VIII	abor	- 20	000/10 000
	3.00				000/19,000
	2			= 2.0	U
Overhead= 44,0	000/22,000	Overh	ead- 10	0000000	``.
	2.00	Overn	cau- 19	9,000/19,00	
The state of the s	2.90			z = 1.0	0

# Chapter 10 Process Costing

# Journal entries:

a.	Work in process - Dept. 1 Work in process - Dept. 2 Materials Materials issued.	100,000 54,000	154,000
<b>b.</b>	Work in process - Dept. 1 Work in process - Dept. 2 Payroll Labor cost.	66,000 38,000	104,000
<b>C.</b>	Work in process - Dept. 1 Work in process - Dept. 2 Factory overhead applied Overhead applied to production	44,000 19,000 ion.	63,000
- d:	Work in process - Dept. 2 Work in process - Dept. 1 Inter-dept. transfer of cost.	180,000	. 180,000
e.	Finished goods Work in process - Dept. 2	270,000	270,000

# MICHELLE CO.

Cost of Goods Manufactured Statement for the month of June, 2019

그렇게 그리는 아이들이 아이를 하는데 그리다 때문을 살아왔다.	D	154,000
Direct materials	ŗ	
Direct labor		104,000
		64,000
Factory overhead	D	321,000
Total manufacturing cost	T ×	
Less: Work in process, June 30		51,000
Cost of goods manufactured	Ρ.	270,000
Cost of goods manufactured	_	

Accounting for scrap and defective units in a process cost system is essentially the same as in a job order cost system. Cost to rework defective units in a process cost are normally charged to Factory Overhead Control rather than to Work in Process are normally charged to Factory Overhead Control rather than to Work in Process because defective units in a process cost system are usually the result of an internal because defective units in a process cost system are usually the result of an internal cost system are actually the same as the spoiled under the job order system. The units cost system are actually the same as the spoiled under the job order system. The units are still with the company, but due to imperfections discovered during quality control inspection, they were removed from the manufacturing process.

NORMAL/ABNORMAL LOSSES

Normal losses are expected while abnormal losses are those in excess of what have been predicted. The cost of normal lost units are reported as product cost, since eventually they become part of the cost of good units. The cost of abnormal lost units are recognized as period costs as charges for abnormal lost units are debited to Factory Overhead Control.

A. The cost of normal lost units is charged to (a) completed units, and (b) units in process at the end when

1) Discovered at the beginning of the process,

2) Discovered during the process and no quality control inspection is indicated,

3) Discovered at the end of the process

B. The cost of the abnormal lost units is charged to a loss account or factory overhead

1) Discovered at the beginning

2) Discovered during the process with the point of discovery stated in the problem

4) Discovered at the end of the process

Suggested procedures in calculating the equivalent units of production for normal lost units under:

### 1) A-1 and A-2

- a) Do not assign work done to the lost units, and
- b) Adjust the unit cost from the preceding department due to the decreased number of units
- c) The above procedures automatically charge the cost of the normal lost units to both completed units and units in process at the end.

## 2) A - 3

- a) Assign work done to the lost units.
- b) No need to adjust the unit cost from the preceding department despite the lost units.
- c) Calculate the cost of the lost units and add to cost of the completed units

- 3) B-1
  - a) Do not assign work done to the lost units
  - b) Cost from the preceding department will be charged to factory overhead

# 4) B-2 and B-3

- a) Assign work done to the lost units
- b) The cost of abnormal lost units is charged as an abnormal loss and debited to Factory Overhead Control as a period cost.

Suggested procedures in calculating the equivalent units of production abnormal lost units.

- a) If discovered at the beginning of the process, no need to assign work done. Any cost from the preceding department is charged as an abnormal loss.
- b) If discovered at any other points in the process, with or without indicated inspection point, assign work done and the cost is charged to Factory Overhead Control.

#### **ILLUSTRATIVE PROBLEM 2**

Woodrose Corporation produces a product in two departments - A and B. Data for the month of August, 2019 are given as follows for Department B.

UNITS	
-------	--

Received from Department A	50,000
Completed and transferred to warehouse	40,000
In process, Aug. 31 (60% completed)	5,000
Lost during the month	5,000

#### COSTS

From Department A	Г	223,000
Added in Department B during the month		
Materials		135,000
Labor		103,200
Factory overhead		103,200

P 225 000

In this department, materials are added 100% at the beginning of the process

Requirements: Prepare cost of production report under the following assumptions:

- 1. Lost units classified as normal, discovered at the beginning of the process.
- 2. Lost units classified as normal, discovered at the end of the process.
- 3. Lost units classified as abnormal discovered at the end of the process.

# SOLUTION:

1. Lost units classified as normal, discovered at the beginning of the process (A-1).

WOODROSE CORPORATIO	N
Cost of Production Report	

for the month ended August 31, 2019  Materials Labor & OH						
	TOT THE MONTH		Materia	115		<u>&amp; OH</u>
Quantity Schedule	Actual	WD	<u>EP</u>	$\underline{\text{WP}}$		<u>EP</u>
Units received	50,000	The state of				
					,	10.000
Units completed	40,000	100%	40,000			40,000
Units in process	5,000	100%	5,000	) 60%	0	3,000
Units lost	5,000	-		<u>.                                     </u>		42.000
	50,000		45,000	]		<u>43,000</u>
			· ·			
Costs charged to the d	epartment			225.000		D 450
Costs from prece	ding department		<u>P</u>	225,000		P 4.50
Cost added in the Materials	department	,		135,000		3.00
Labor				103,000		2.40
Factory over	rhead			103,200		2.40
Total costs a				341,400		7.80
Adjustment for		-				.50
Total costs to be		76.	P	566,400		P 12.80
Cost accounted for as		The state of		a Maria	401	
Completed & train	nsferred		1	11 44.5	P	512,000
In process, end		- %.				
	receding departme	ent	P 2:	5,000	-15	
Materials	-		1:	5,000		
Labor				7,200	54	
Overhead Total costs as acc	counted for			7,200		54,400
Total costs as acc	Southed for			-	<u>P</u>	5 <u>66,400</u>
Computations:						
	aterials	= 125 0	ω			
		172,0	000 = 3	.00		

cost:	Materials	= 135,000 = 3.00 $45,000$
	Labor	$= \frac{103,200}{43,000} = 2.40$
1 Harry	Factory OH	$= \frac{103,200}{43,000} = 2.40$

Adjustment for lost units:

Method 1 = Cost from preceding department - unit cost from

Total units less lost units preceding dept.

= 225,000 - 4.50
45,000
= 0.50

Method 2= Units lost x unit cost from preceding dept.

Total units less units lost

 $= \frac{5,000 \times 4.50}{45,000}$ = 0.50

Cost of units completed =  $40,000 \times 12.80$ 

In process at the end

 Cost from preceding dept.
 =  $5,000 \times 5.00$  

 Materials
 =  $5,000 \times 3.00$  

 Labor
 =  $3,000 \times 2.40$  

 Overhead
 =  $3,000 \times 2.40$ 

The unit cost from the preceding department was increased by P 0.50 representing the adjustment for the lost units. Each unit at this point must absorb an additional cost of P 0.50 as share in the cost of the lost units.

## Journal entries

1. Work in process – Department B Work in process – Department A	225,000	225,000
2. Work in Process – Department B  Materials  Payroll  Factory Overhead Applied	341,400	135,000 103,200 103,200
3. Finished Goods- Work in Process – Department B	512,000 512	2,000

All and the second	the and of the proces
	as normal, discovered at the end of the process (A-3)
	-1 discovered with
	normal, unov
	مستقبارا کو کردی،

and as normal, alsoo.		31
Quantity Schedule       Actual 50,000       WD       EP         Units received       40,000       100%       40,000         Units completed       5,000       100%       5,000         Units in process       5,000       100%       5,000         Units lost       50,000       50,000       50,000	Labor & OH WD EP 100% 40,000 60% 3,000 100% 5.000 48,000	
Cost charged to the department Cost from preceding department	P 225,000	P 4.50
Cost added in the department  Materials  Labor  Factory overhead  Total cost added  Total costs to be accounted for	135,000 103,200 103,200 341,400 P 566,400	2.70 2.15 2.15 7.00 P 11.50
Cost accounted for as follows Completed & transferred	P	517,500
In process, end Cost from preceding department Materials Labor	P 22,500 13,500 6,450	a territor
Factory overhead  Total costs as accounted for	6,450 <u>P</u>	48,900 556,400

# Computations:

Unit cost:

Materials = 
$$\frac{135,000}{50,000} = 2.70$$
  
Labor =  $\frac{103,200}{48,000} = 2.15$   
Overhead =  $\frac{103,200}{48,000} = 2.15$ 

No adjustment for lost units is necessary since the cost of the lost units will be added to the cost of the completed units only. The computation for the cost of the units completed will be as follows:

Units completed (40,000 x 11.50) + (5,000 x 11.50) = 517,500
Units in process, end

Cost from preceding dept. = 5,000 x 4.50

Materials = 5,000 x 2.70

Labor = 3,000 x 2.15

Overhead = 3,000 x 2.15

### Journal entries

I. Work in process – Department B Work in process – Department A	225,000 225,000
2. Work in Process - Department B	341,400
Materials	135,000
Payroll	103,200
Factory Overhead Applied	103,200
3. Finished Goods	517,500
Work in Process - Department B	517,500

# Lost units classified as abnormal, discovered at the end

3. The equivalent production will be the same as when the lost units are classified as normal discovered at the end. It follows then that the unit cost will also be the same. The total cost as accounted for will appear as follows:

### Costs accounted for as follows:

Completed & transferred (40,000 x 11	.50)	460,000
Factory overhead control (5,000 x 11.5	50)	57,500
In process, end	Saland Coll. 200	
Cost from preceding (5,000 x 4.5	0) 22,500	
Materials (5,000 x 2.70)	13,500	
Labor $(3,000 \times 2.15)$	6,450	
Overhead (3,000 x 2.15)	6,450	48,900
Total costs as accounted for	anthografic transfer	566,400

517,500

Yann						
Jour	nal entries	The Tark	225,000			
I	. Work in process - Depart	ment B	225,000			
CALLES.	Work in process –	Department A				
			y ir convicted a formation of the estimate			
2	.Work in Process – Depart	iment B	341,400			
	Materials	100	135,000			
			103,200			
	Payroll Factory Overhead	Annlied	103,200			
	ruciory Overneua	Арриси				
3.	Finished Goods	nout to	460,000			
J.	- moneta doors	* t	57,500			
	Factory Overhead Con		517,500			
A1.	Work in Process -	Department b	months products in his in the			
MOTE	· If which are	· d water	dam is the last department in the			
Proper	H me department given	in the previous proc	plem is the last department in the			
proces	s and the spoiled units (lo	st units) are with a s	sales value P 7.00 each, the cost			
accoun	ited for section will appear	as follows:	LANGER PROCESSES ALLE STORY			
	accounted for as follows:		Alima Leono			
	ompleted & transferred (40		460,000			
	ransferred to Spoiled Good		7) 35,000			
Fa	ectory Overhead Control (:	5,000 x 11.50)	57,500			
•	Less: Market value of		<u>35.000</u> 22,500			
In	process, end	•	5.50 William (1997)			
	Cost from preceding (5	$000 \times 4.50$	22,500			
	Materials $(5, \sqrt{00} \times 2.70)$		13,500			
The sale	Labor (3,000 x 2.15)		6,450			
1	Overhead (3,000 x 2.15	A rad shimmer the	to the second of			
	3 (5,000 H 2,13		6,450 48,900			
Torran			<u>566,400</u>			
	nal entries	fit he the same as wh	S. T. o. The training of the land of the			
的附 社会	Work in process - Depart	ment B	225,000			
	Work in process –	Department A	225,000			
			223,000			
2	Work in December 1	•				
2.	Work in Process – Depart	ment B	341,400			
	Materials	(n; a x sat)				
	Payroll	US HARD	135,000			
	Factory Overhead	Applied	103,200			
	, 100 SOUP	(APA LOS)	. 103,200			
3.	Finished Goods	7				
	Spoiled Goods Inventor	v · ·	460,000			
3 4	Factory Overhead Cont		35,000			
	Work in Process -	Donald	22,500			
	OIN HI 1 100E33 -	Department B	517,500			
		· · · · · · · · · · · · · · · · · · ·	217,200			

# INCREASE IN UNITS DUE TO ADDITION OF MATERIALS

With some products, the addition of materials in the subsequent departments may cause the units to increase. This require an adjustment in the unit cost from the preceding department because the total cost will remain the same while the units to absorb the same cost will increase and this will result in a decrease in the unit cost from preceding department.

Computation of adjusted cost from preceding department

Total cost from preceding department Units received + increase in units

If lost units are discovered in the same department where we had an increase in units, the adjusted cost will be computed based on the following assumptions.

a. Lost units normal, discovered at the beginning of the process

Adjusted cost = Cost from preceding department Total units received less lost units

- b. Lost units normal, discovered at the end of the process Adjusted cost = Cost from preceding department Total units received
- c. Lost units abnormal, discovered at the beginning, during or at the end Adjusted cost = Cost from preceding department Total units received

### **ILLUSTRATIVE PROBLEM 3**

Seashore Company produces a product which requires processing in the departments. In the second department, materials are added at the beginning, increasing the units received by 20%. The following data pertain to the operations of Dept. 2 for June

Units received from Dept.1	50,000 units
Units completed & transferred to Dept. 3	45,000 units
Units in process, end	15,000 units
Stage of completion	80%

Cost from Department 1	00 %		noo Bee	600,000
Cost added in the Department			SAR DA	# (M) ( () 11/1/19/19/19/19/19/19/19/19/19/19/19/19
Materials	100 2		000 FCF	240,000
Labor	9. 1.	,	ADD TR	171,000
Overhead	50 C	250	060 517	114,000
D	10-14-120			Project 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Required: Cost of production report.

Solution:  Ouantity Schedule		Produc h ende	COMPANY etion Report ed June 30, 20 erials <u>EP</u>	19 Labor & WP	OH EP
Units received	50,000	15 1.	Man lease		
Increase in units	10,000				
Units completed Units in process	60,000 45,000 15,000 60,000	100% 100%		100% 80%	45,000 12,000 57,000
Costs charged to the de Cost from precedi	<u>partment</u> ng department		P 600	,000	P 12.00
Cost added in the	department		240	,000	4.00
Materials				,000	3.00
Labor				,000	2.00
Overhead Tatal aget ad	dad			,000	9.00
Total cost ad	ued t from precedin	o dena		To arms	10.00
Total cost to be ac	counted for		P 1,125.	000	P 19.00
Costs accounted as foll Completed & tran In process, end		กวเล็ง	F.W.1.	PRÚ)	P 855,000
	eceding departs	nent	P 150	,000	
Materials	Traduction William	o mar		,000	
Labor				,000	
Overhead		4 .19:		,000	270,000
Total costs as acco	ounted for			LONG CO	P 1,125,000
Computations:Unit cos	st:				
Materials	= <u>240,000</u> 60,000		4.00 frameto	l muc les Q udi	
Labor	= <u>171,000</u> 57,000	=	3.00		Halaeta) H Tudadi
Overhead	= <u>114,000</u> 57,000	<b>=</b> .	2.00	Lubing	Chemein Maired: Com of

Adjusted cost from preceding =  $\frac{600,000}{60,000}$  = 10.00

## Journal entries

1. Work in process – Department 2 Work in process – Department 1	600,000
2. Work in Process - Department 2	525,000
Materials de la contraction de	240,000
Payroll	171,000
Factory Overhead Applied	114,000
A Magazina i jest kiti i bajasa sali ing ina	profesor and the
3. Finished Goods	855,000
Work in Process – Department B	855,000

Su desemble super a su é etc su en la grafip a à sus vir ge à la regret au complet du la monte. L'il dévice part du blevent de fre fentandant de férrine dans d'il commune cum aux entre de tenta.

What are the defence downstance of his person of the product on report

in the same of their control of the

# **QUESTIONS**

1. What are the two basic systems of cost accounting and under what conditions may each be used advantageously?

guilled Costing

- 2. What documents constitute the supporting subsidiary ledger for work-in-process inventory when using a process costing system?
- 3. What do we mean by the term equivalent units of production? How is such a figure calculated?
- 4. How are the equivalent units of production figure used in connection with a process costing system?
- 5. Explain why it is necessary to estimate the stage or degree of completion of work in process at the end of the accounting period under the process costing system.
- 6. What would be the effect on the unit cost of finished goods if an inaccurate estimate of the stage of completion of work in process is made?
- 7. What is a cost of production report?
- 8. What are the different divisions of a cost of production report?
- 9. What are spoiled units? In what way are they similar to spoiled units under job-order costing?
- 10. How are spoiled units accounted for?

# TRUE OR FALSE QUESTIONS

Indicate whether the following statements are true of false by inserting in the blank space provided a capital "T" for true or "F" for false.
1. Process costing is used when identical units are produced through an ongoing series of uniform steps.
2. A utility such as the water company would typically use a process costing system.
3. If processing departments are arranged in a parallel manner, all units will go through all departments.
4. Costing is more difficult in a process costing system than it is in a job-order costing system.
5. In a process costing system, the cost of production report takes the place of the job cost sheet.
6. Process and job-order costing are similar in that costs are accumulated (and unit costs are computed) for each separate customer order.
7. In a process costing system, a Work in Process account is maintained for each department.
8. It is important to identify labor costs with each customer order in a process costing system.
9. Operation costing employs aspects of both job-order and process costing systems.
10. Since costs are accumulated by department, there is no need for a Finished Goods inventory account in a process costing system.
11. In a process costing system, costs incurred in one department remain there rather than being transferred on to the next department.
12. On a production report, labor and overhead costs are often added together and called conversion costs.
13. If materials are added 100% at the beginning of the process, then the

14. The purpose of the quantity schedule is to show the costs charged to the

15. If all units do go through all processing departments, then the

departments are probably arranged in a sequential pattern.

work in process, end will get 100%.

department.

### MULTIPLE CHOICE

- 1. In a process costing system that assumes that normal spoilage occurs at the end of a process, the costs attributable to normal spoilage should be assigned to:
  - a. ending work in process inventory.
  - b. cost of goods manufactured and ending work in process inventory.
  - C. cost of goods completed.
  - d. a specific loss account highlighting the inefficiencies.
- 2. An equivalent unit of material or conversion cost is defined as:
  - a. the amount of material or conversion cost necessary to complete one unit of production.
  - b. a unit of work in process inventory.
  - c. the amount of material or conversion cost necessary to start a unit or production.
  - d. 50% of the material or conversion cost of a unit of finished goods inventory assuming a linear production pattern.
- 3. In a process costing system, how is the unit cost affected in a cost of production report when materials are added in a department subsequent to the first department and the added materials result in additional units?
  - a. It causes an increase in the preceding department's unit cost.
  - b. It causes a decrease in the preceding department's unit cost that requires an adjustment of the transferred-in cost.
  - c. It causes an increase in the preceding department's unit cost but does not require an adjustment of the transferred-in cost.
  - d. It causes a decrease in the preceding department's unit cost but does not require an adjustment of the transferred-in unit cost.
- 4. Which of the following does not occur with process costing?
  - a. Allocation of on a periodic basis.
  - b. Allocation of cost upon completion of job.
  - c. Allocation of cost with regards to stage of completion.
  - d. Calculation of equivalent units.

- 5. Which of the following is true of abnormal spoilage?
  - a. It is considered to be part of production.
  - b. It is normally treated as a period cost.
  - c. It is normally treated as a product cost.
  - d. It is prorated between cost of goods sold and inventory.
- 6. Prior department costs are most similar to:
  - a. conversion costs that are added continuously throughout the process.
  - b. costs in beginning inventory.
  - c. materials added at the beginning of the period.
  - d. transferred-out cost.
- 7. Normal spoilage costs are most often classified as:
  - a. a product cost.
  - b. a period cost.
  - C. deferred charge.
  - d. extraordinary item.
- 8. Which of the following products would most likely be accounted for with a process costing system?
  - a. A public accounting firm.
  - b. A retailer.
  - c. Airplane manufacture.
  - d. Gasoline refinery.
- 9. Process costing should be used in assigning cost to products in which of the following situations?
  - a. If the product is composed of mass-produced homogeneous units.
  - b. If the product is manufactured individually based on an order received.
  - c. When the product is composed of heterogeneous units made in a job shop.
  - d. Whenever cost allocation is not used.

- 10. An error was made by RAGC Company in computing the percentage-ofcompletion of the current year's ending work in process inventory. The error resulted in the assignment of a lower percentage of completion to each component of the inventory than actually was the case. There was no beginning work in process inventory. What is the effect on the following?
  - 1. The computation of equivalent units in total.

2. The computation of costs per equivalent unit.

3. Cost assigned to cost of goods completed for the period.

	1	the same of the sa	
a.	understated	understated	overstated
	understated	overstated	overstated
	overstated	understated	understated
	overstated	overstated	understated

- 11. Which of the following production operations would be most likely to employ a process cost system?
  - a. Shipbuilder
  - b. Aircraft manufacturer
  - c. Bottler of mineral water
  - d. Homebuilder
- 12. The total amount in the Costs To Account For schedule must equal the total amount on the
  - a. Quantities Schedule
  - b. Equivalent Production Schedule
  - c. Cost to Account For Schedule
  - d .Costs Accounted For Schedule
- 13. The system flow in which the initial raw materials are placed into process in the first department and flow through every department in the factory is called a

If the product is confided of the products

- a. Sequential product flow
- b. Parallel product flow
- c. Selective product flow
- d. Uniform product flow and all publishes because from at his bone and it
- 14. The analysis of the activity in a department or cost center for a period is called a
  - a. Quantity report
  - b. Cost of production report
  - c. Cost of goods manufactured report
  - d. Equivalent production report

### PROBLEMS

Problem 1
Compute the equivalent production for the month for each of the following situations:

F1 + 2					
	Units Completed <u>During Month</u>	Units in Process End of Month	Stage of Completion		
a)	10,000	5,000	1/2		
b) na/or 1, 47/11	26,000	affect and as 8,000 can a	3/4		
.c)	12,000	2,000	3/4		
d) ,	20,000	6,000	1/2		
*		4,000	3/4		
e)	45,000	2,000	1/5		
		3,000	3/4		

#### Problem 2

The Casper Corporation recorded costs for the month of P15,750 for materials, P 40,950 for labor, and P 25,200 for overhead. There was no beginning work in process inventory,: 9,000 units were completed and transferred and 2,000 were in process at the end of the period, 3/4 completed.

Required:

- 1. Compute the equivalent production for the month.
- 2. Compute the month's unit cost for each element of cost.

### Problem 3

Compute the equivalent production for the month for each of the following cases:

- Case 1 Started in process 10,000 units; completed 8,000 units; work in process, end of period 2,000 units, 3/4 completed. All material are added at the beginning of the process.
- Case 2 Received from preceding department 40,000 units; completed 34,000 units; work in process, end of period, 6,000 units, 1/4 completed. All materials are added at the end of the process.
- Case 3
  -Started in process 40,000 units; completed 34,000 units; closing inventory goods in process 3,000 units, 1/3 completed, and 3,000 units, 1/5 completed. 75% of the materials are added at the beginning of the process and 25% when the process is 1/2 completed.

44,400

Problem 4	cords of The Beautiful Company:
The following data appeared in the accounting re-	12,000 units
Started in process	10,500 units
Completed and transferred	1,500 units
Work in process, end of month Stage of completion	2/5 complete
Costs: Or Cost of the Cost of	Legicino Catto
Materials Alaca Alaca Data	P 72,000
Lahan	88,800

Overhead
One half of the materials are added at the beginning of the process and the balance when the units are one-half completed.

Required: Calculate the following:

Labor

- 1. Equivalent production for materials and conversion cost.
- 2. Cost of the units completed and transferred.
- 3. Cost of the units in process at the end of the month.

#### Problem 5

ABM Company uses two departments to produce a product. The following data were taken from the books for the month of January, 2019.

Department 1	Department 2
60,000	
40,000	30,000
20,000	10,000
75%	80%
	to guaranty of the
P 480,000	P 245,000
330,000	190,000
220,000	114,000
	60,000 40,000 20,000 75% P 480,000 330,000

Department 1 - all materials added at the beginning of the process.

Department 2 - 50% of the materials are added at the beginning of the process, remaining 50% added at the end of the process.

Required: Cost of production report.

#### Problem 6

Ten-Ten Corporation manufactures a chocolate covered strawberry-filled candy bar using two departments, Processing and Packaging.

The first step in the Processing Department is to add strawberry. The strawberry is then cooked and seasoned. Conversion costs are assumed to be incurred evenly throughout the process. The last step in the Processing Department before going on the Packaging is the covering of the strawberry with chocolate.

For the month of July, 2019, 90,000 units were completed and at the end of the month, 10,000 remains in process and are 70% completed. Materials cost incurred, strawberry - P180,000; chocolate - P 135,000, and conversion costs, P 116,400.

- Required: 1. Equivalent production for strawberry, chocolate and conversion cost
  - 2 .Unit cost for strawberry, chocolate and conversion cost
  - 3. Total costs of units completed and transferred to the next department
  - 4 Total costs of the units in process, end

#### Problem 7

Lenlen Corporation produces a product through a continuous process in two departments. Materials in this department are added at the beginning of the process. The production and cost data were taken from Department B during September, 2019.

#### Production data:

Received from Department A	8	0,000 units
Completed and transferred	6	0,000 units
In process, end (50% complete)	1	0,000 units
Lost	I	0,000 units
Cost data:		
Danastmant A	그러워하다 그십시아(1967) 그 등	60 000

Received from Department A 560,000 175,000 Materials 121,875 Labor 243,750 Overhead

Cost of production report under the following assumptions: Required:

- a. Lost units normal, discovered at the beginning
- b. Lost units normal, discovered at the end
- c. Lost units abnormal, discovered when 60% completed
- d. Lost units abnormal, discovered at the end. The estimated value of the spoiled units P 12.00 each.

#### Problem 8

The JBriones Company uses process costing in its two producing departments. The following information pertain to Department 2 for November.

Normal spoilage is 5% of output; inspection and identification of spoilage take place at the end of the process; materials are added after inspection.

Department 2 received 28,000 units from Department 1 at a cost of P280,000. Department 2 costs were P24,000 for materials and P180,000 for conversion costs.

A total of 16,000 units were completed and transferred to finished goods. At the end of the month, 10,000 units were still in process, estimated to be 60% complete as to conversion costs.

Required: Cost of production report for Department 2.

#### Problem 9

The EDSA Corporation manufactures a product in two departments. Materials are added in each department, increasing the number of units manufactured. A summary of the cost for the company's first month of operations (January) is as follows:

	Charte Bill	-111	Department 1	89.80	Department 2
Materials	7.	P	180,000	P	135,000
Labor			78,000		82,800
Factory Overhead			15,600		41,400

The production supervisor reports that 60,000 units were put into production in Department 1. Of this quantity, 15,000, a normal number, were lost in production; and 36,000 were completed and transferred to Department 2. For the balance in process at the end of the month, all materials had been added, but only one third of the labor and factory overhead had been applied.

In Department 2, 9,000 units of materials were purchased outside and added to the units received from Department 1; 39,000 were completed and transferred to finished goods inventory. The remainder were in process at the end of the month, with all materials added, but only 40% complete for labor and factory overhead.

Required: Cost of production report.

### Problem 10

Juniper Company manufactures a single product in two departments, Cutting and to the Finishing Department, where they are completed. Units are inspected at the end transferred to Spoiled Goods Inventory, Spoiled units are inventoried at their salvage of P15.00 each, and the unrecoverable cost of spoilage is charged to Factory Overhead Control.

During July, 5,000 units were transferred from the Cutting Department to the Finishing Department and 3,800 were transferred from the Finishing Department to Finished Goods Inventory. At the end of July, the Finishing Department still had 800 units in process, 40% complete as to materials and 20% complete as to conversion costs. Cost data related to July operations in the Finishing Department are:

Cost from preceding department	P	60,000
Materials		22,600
Labor		17,440
Overhead		13,080

Required:

- 1. Cost of production report for the Finishing Department.
- 2. Prepare the appropriate general journal entry to record the transfer of cost out of the Finishing Department this period.

### Problem 11

Data presented below were taken from the books of the Diamond Company for the month of September, 2019.

Units transferred in	55,000
Units added to production	5,000
Units transferred out	48,000
Units in process, end	12,000
Materials 100% complete, conversion costs	000 110
70% complete	
Costs transferred in P	24,750
Cost added in the department	
Direct materials	7,200
Conversion cost	53,580

Required:

- 1. Determine the equivalent production for materials and conversion costs
- 2. Determine the cost of the units transferred out
- 3. Determine the cost of the units in process, end

## **MULTIPLE CHOICE**

Glendale Company is using process costing system. The following were taken from the books for Department 2 for the month of June. Quality control inspection is done when the units are 80% completed and materials are added 100% after inspection.

if the units are 60% completed and mass-		50,000
Units received		40,000
Units completed and transferred		5,000
Units in process, end (60% completed)	,	5,000
Units lost (normal)		2,000

- 1. Equivalent production for materials is:
  - a. 50,000
  - b. 45,000
  - c. 40,000
  - d. 43,000
- 2. Equivalent production for conversion costs is:
  - a. 43,000
  - b. 44,000
  - c. 47,000
  - d. 45,000

Same data as in 1 & 2, this time we assume that the units in process, end are 90% completed.

- 3. Equivalent production for materials is:
  - a, 50,000
  - b. 45,000
  - c. 40,000
  - d. 43,000
- 4. Equivalent production for conversion costs is:
  - a. 43,000
  - b. 44,000
  - c. 44,500
  - d. 48,500

Same data as in 1 & 2, this time we assume that the lost units are classified as

- 5. Equivalent production for materials is:
  - a. 50,000
  - b. 45,000
  - c. 40,000
  - d. 48,000

A company's records show the following information for August:

- A. Started this month, 38,000 units
- B. Ending inventory, 12,000 units. 15% complete as to materials and 10% complete as to conversion costs.
- 6. How many units were transferred out during the month?
  - a. 22,000 units
  - b. 26,000 units
  - C. 18,000 units
  - d. 42,000 units
- 7. How many units were started and completed during the month?
  - a. 18,000 units
  - b. 22,000 units
  - c. 26,000 units
  - d. 30,000 units
- 8. For materials, how many equivalent units were produced?
  - a. 25,800 EU
  - b. 26,000 EU
  - c. 27,800 EU
  - d. 50,000 EU
- 9. For conversion costs, how many equivalent units were produced?
  - a. 24,000 EU
  - b. 27,200 EU
  - c. 27,800 EU
  - d. 50,000 EU

Credit

Normal spoilage was computed to be 2,000 units. Spoilage is discovered at the end of the process and is debited to Finished Goods Inventory, it is not spread over good the process and is debited to Finished Goods Inventory, it is not spread over good units produced. Costs per equivalent unit were: Prior department P 3.00; Materials p units produced. Costs per equivalent unit were: Prior department P 3.00 units from work in

2.00; Conversion costs P4.00.

10. The journal entry to remove all the costs of spoiling the 2,000 units from work in

process is as follows:

	Debit	D far Inventory
a.	Finished Goods Inventory	Work in Process Inventory for 6,000
	for P6,000	
b.	WP Inventory for P6,000	FG Inventory for P6,000
c.	FG Inventory for P12,000	WP Inventory for P12,000
	FG Inventory for P18,000	WP Inventory for P18,000

Stockton Company adds materials at the beginning of the process in Department M. Data concerning materials used in March production are as follows:

Started during March	50,000 units
Completed and transferred	36,000 units
Normal spoilage	4,000 units
Work in process at March 31	10,000 units

- 11. The equivalent units for materials are:
  - a. 50,000
  - b. 34,000
  - c. '40,000
  - d. 46,000

Materials are added at the start of the process in Cesar company's blending department, the first stage of the production cycle. The units started during the month were 210,000. Completed and transferred, 110,000 and in process, end (50% comp) were 70,000. Under Cesar's cost accounting system, the costs incurred on the lost units are absorbed by the completed units only.

- 12. What are the equivalent units for materials?
  - a. 120,000
  - b. 145,000
  - c. 180,000
  - d. 210,000

Ellery Company instituted a new process in October, 2016. During October 10,000 units were started in Department A. Of the units started, 1,000 were lost by shrinkage in the process, 7,000 were transferred to Dept. B, and 2,000 remained in work in process at October 31. The work in process at Oct. 31 was 100% complete as to materials and 50% complete as to conversion cost. Materials costs of P27,000 and conversion costs of P 40,000 were charged to Department A in October.

- 13. What were the total costs transferred to Dept. B?
  - a. P 53,900
  - b. P 56,000
  - c. P 61,600
  - d. P 62,000
- 14. What were the costs of the units in process, October 31?
  - a. P 10,400
  - b. P 11,000
  - c. P 15,000
  - d. P 18,100

A sporting goods manufacturer buys wood as a direct material for baseball bats. The Forming department processes the baseball bats, and transfers the bats to the Finishing department where additional work is applied. The Forming department began manufacturing 10,000 bats during the month of May. There was no beginning inventory. Costs for The Forming department for the month of May follows:

Direct materials P 33,000 Conversion costs 17,000

A total of 8,000 bats were completed and transferred to the Finishing department, the remaining 2,000 bats were still in process at the end of the month. All of the Forming department's direct materials were placed in process, but on average, only 25% of the conversion cost was applied to the ending work in process inventory.

- 15. The cost allocated to units transferred to the Finishing department
  - a. P 50,000
  - b. P 40,000
  - c. P 53.000
  - d. P 42,400
- 16. The cost allocated to the units in process at the end of the month
  - P 2,200 a.
  - b. P 4,000
  - P 4,800 Ċ.
  - P 7,600 d.

Alonzo Manufacturing uses a process costing system to accumulate costs related to the production of "Supergrow" an industrial strength hair grower. Material costs and conversion costs for last quarter are provided below:

Conversion Costs Materials. P 348,705 P 281,650 Current cost for the quarter 258,300 262,000 Equivalent production

All materials are added at the beginning of the production process.

- 17. If the number of bottles completed during the quarter is 255,200, what is the total cost that should be assigned to these bottles?
  - P 618,860
  - b. P 629,922
  - c. P 629,200
  - d. P 638.000
- 18. The cost allocated to the bottles in process at the end of the month
  - P 31,036
  - b. P 20,798
  - c. P 20,620
  - d. P 11,495

Materials are added at the start of the process of Calvin Company's Blending Department, the first stage of the production cycle. The following information is available for the month of July. Units started - 210,000, completed and transferred -110,000, units in process, end - 70,000 (50% complete). Under Calvin's cost accounting system, the costs incurred on the lost units are absorbed by the remaining good units.

- 19. The equivalent units for materials
  - a. 120,000
  - b. 145,000
  - c. 180,000
  - d. 210,000
- 20. The equivalent units for conversion costs
  - a. 120,000
  - b. 145,000
  - c. 180,000
  - d. 210,000

M Company has two producing departments - Departments A and B. Department A works on raw material XYZ and then transfers it to Department B. After Dept. B puts on its finishing touches, it transfers the product to Finished Goods Inventory.

- 21. If Dept. A had put 95,000 units into process, during the period and had ending work in process of 21,000 units, what is the number of units transferred to finished goods inventory, if Dept. B's ending units in process are 12,000?
  - a. 104,000
  - b. 85,000
  - c. 74,000
  - d. 62,000
- 22.M Company adds direct materials at the beginning of the production process in Department A. If Department A's ending units in process are 60% complete as to conversion costs, what is Department A's equivalent units for materials?
  - a. 80,000
  - b. 86,600
  - c. 95,000
  - d. 102,400

The following information for Dept. B of Kitkat Company for the month of May

Received from Dept. A
Completed and transferred to Dept C
Additional information

600,000 units 500,000 units

- a. Ending work in process is 75% complete
- b. May's production costs total P2,760,000
- 23. Dept B's unit cost of production for May 2019 is
  - a. P 4.60
  - b. P 4.80
  - c. P 5.02
  - d. P 5.52

Virgo Company completed 280,000 units of Product A and has 10,000 units which were 50% complete as to conversion cost. Direct materials, which were introduced at the start of processing, cost P435,000 while conversion cost amounted to P 142,500. There were no beginning inventories.

24. The equivalent units as to conversion cost were

- a. 142,500
- b. 280,000
- c. 285,000
- d. 290,000

A company produces plastic kitchenware and uses process costing system. Products go through three departments – Mixing, Molding, ad Packaging. During the month of August, the following information is made available for the Mixing Department

Units started	160,000
Units completed and transferred	140,000
Units in process, end (25% complete)	20,000

Materials are added at two points in the process. Material A is added at the beginning of the process and Material B when the units are 50% completed. Conversion costs are incurred uniformly throughout the mixing process.

25. The equivalent production for Material A

- a. 140,000
- b. 145,000
- c. 150,000
- d. 160,000

# AVERAGE AND FIFO COSTING

# LEARNING OBJECTIVES

Upon the completion of this chapter, you should be able to

• Discuss the effect of beginning work in process inventories

Discuss the differences between the weighted average and fifo methods used to account for beginning work in process inventories.

Discuss how to deal with spoiled units in a process cost system.

Discuss how scrap and waste materials are handled in a process cost system

The examples in the previous chapter are without beginning work in process inventories. This situation would probably exist only in the first month of a new business or in a new production process because its usually continuous and some units will therefore still be in process at the end of the period. The ending work in process inventory of the previous period will become this period's beginning work in process inventory.

The existence of beginning work in process inventories creates a problem in process costing because of the following questions that must be considered.

1. Should a distinction be made between completed units from beginning work in process inventory and completed units from the current period?

2. Should all the units completed during the current period be included at 100% in equivalent production regardless of the stage of completion of beginning work in process inventory?

3. Should the cost of the beginning work in process inventory be added to costs which have been added to production during the current period to arrive at "Costs added during the period?

The answers to these questions will depend on the method chosen to account for beginning work in process inventory - weighted average costing or first-in, first-out (FIFO) costing. Under the weighted average method no distinction is made between completed units from beginning work in process and completed units from the current period. It is as if all completed units were started and completed during the period. Under fifo method, units in the beginning work in process inventory are reported separately from units of the current period.

# METHODS OF COSTING UNDER PROCESS COSTING

1. <u>FIFO method</u> - under this method, there is an assumed flow of manufacturing operations and as such it is considered that those units which are first placed into process are presumed to be the first ones completed and those that are first completed are the ones transferred out.

### Characteristics:

- 1. The work in process beginning in the department will require separate computations for its equivalent production.
- 2. The units started, completed and transferred will have its own computation for the equivalent production.
- 2. AVERAGE method under this method, there is no assumed flow of manufacturing operation. It involves the merging of the departmental costs, by elements, of the initial work in process inventory with the costs incurred in the current month and securing a representative average unit cost by dividing the total element of costs by the equivalent production based upon the sum of units in the initial work in process inventory and the units placed into production during the period.

### **Characteristics:**

1. In the computation of the equivalent production, the stage of completion of the work in process beginning is ignored and the total units completed and transferred during the period is considered to have 100% completion.

# DIFFERENCES BETWEEN FIFO AND AVERAGE

# A. Computation of equivalent production:

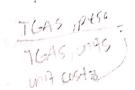
- 1. FIFO work done last month on the units in process, beginning is considered. The work done needed to make the work in process 100% is the work done assigned for the current month. (100% work done last month).
- 2. AVERAGE work done last month on the units in process, beginning is ignored and not considered in the computation of the equivalent production.

# B. Computation of unit cost:

- 1. FIFO = Current period costs

  Equivalent units of current work done
- 2. AVERAGE = Costs in beg. Invty. + Current period cost

  Equivalent units in beg. Invty. + Equivalent
  units of current work done



C. Computation of the cost of goods transferred out and the cost of ending inventory.

Using FIFO, the cost of goods transferred out equals the sum of the following three items.

- a. The costs already in the beginning inventory at the beginning of the period.
- b. The current period costs to complete beginning inventory, which equals the equivalent units to complete beginning inventory times the current period unit cost computed for FIFO.
- c. The costs to start and complete units, calculated by multiplying the number times the current units cost computed.

Using FIFO, the cost of goods in ending inventory equals the equivalent units in ending inventory times the unit current cost.

Using weighted average, the cost of goods transferred out equals the total units transferred out times the weighted average unit cost.

Using weighted average, the cost of goods in ending inventory equals the equivalent units in ending inventory times the weighted average unit cost.

#### STEPS FOR ASSIGNING PROCESS COSTS TO UNITS

- 1. Summarize the flow of physical units.
- 2. Compute the equivalent units produced.

  Using FIFO, this means adding the equivalent units of work done to:
  - a. Complete units in beginning inventory.
  - b. Start and complete units.
  - c. Work on units still in ending inventory.

Using weighted average, this means adding the equivalent units of work done in the current period to the equivalent units of work already done in the beginning inventory from the previous period.

- 3. Summarize the total costs to be accounted for.

  The total costs to be accounted for are the costs in the beginning work in process inventory and current period costs.
- 4.. Compute costs per equivalent unit.

## **ILLUSTRATIVE PROBLEM 1**

# COMPUTATION OF EQUIVALENT PRODUCTION

Units in process, beg. (40% complete)		5,000
Units started		20,000
Units completed		18,000
Units in process, end (80% complete)	or grown distributed	7,000

Materials in this department are added 100% at the beginning of the process.

1 State A	The state of the s		<u>Ma</u>	terials	Labor	<u>&amp; OH</u>
a)	Average method	Actual	<u>WD</u>	EP	WD	EP
	Units completed	18,000	100%	18,000	100%	18,000
	Units IP, end	7,000	100%	7,000	80%	5.600
v	· // · · //	<u>25,000</u>	in the second	25,000		23.600

Take note that under average method, the work done on the work in process, beginning is not considered in the computation of the equivalent production.

b)	FIFO method Units completed	Actual	WD	<u>EP</u>	<u>WD</u>	<u>EP</u>
•	IP, beg. Started & comp. Units IP, end	5,000 13,000 <u>7,000</u> 25,000	100% 100%	13,000 _7,000 20,000	60% 100% 80%	3,000 13,000 <u>5,600</u> 21,600

No material was added to the units in process, beginning during the month because as of the end of last month, the units were already 100% complete as to materials.

## ILLUSTRATIVE PROBLEM 2

The following information relates to the operations of LMN Company for the month of August, 2019.

* *		
	nı	te
U	111	12
-		_

In process, Aug. 1 (40% complete)	1.000
Received from Dept. 1	1,000
Correlate to a Dept. 1	8,000
Completed & transferred	8,200
In process, Aug. 31 (20% complete)	800
transi or (20% complete)	800

Costs

	In I	Process 8/1	<u>C</u>	ost-Aug.
Cost from preceding dept.	P	13,500	P	81,000
Materials		9,000		72,000
Conversion costs	0	5,036		83,580

Materials in this department are added 100% at the beginning of the process.

## **SOLUTION** - Average Method

#### LMN COMPANY

Cost of Production Report for the month ended August 31, 2019

	100	1		T 1.	n .	OLI
Quantity Calcadula			terials	Labo		- 43
Quantity Schedule	Actual	<u>WD</u>	<u>EP</u>	<u>WD</u>	1	<u>EP</u>
Units in process, beg.	1,000					
Units received	<u>8.000</u>	the secretary of				
	<u>9,00</u> 0					
Units completed	8,200	100%	8,200	100%	6	8,200
Units in process, end	800	100%	_800	20%	6	160
	<u>9,000</u>		9,000			8,360
Costs charged to the department						0974
Cost from preceding departr	nent					
In process, August 1			P 13,	500		
Transferred-in during t	he month		81.	000		
				500	P	10.50
Cost added in the departmen	nt 💮 🐫 💮 🔻					e i i i i
In process, August 1						•
Materials		the state of the s	9	,000		
Labor & overhead				,036		
Added during the mont						
Materials		and a sec	72	,000		9.00
Labor & overhead	arman.			,580		10.60
Total cost added in the	•			616	D	19.60
Total costs to be accounted	tor '		P 264	.116	. <u>P</u>	<u>30.10</u>

Costs accounted for as follows:	The street of the second	P 246,820
Completed & transferred	and the second s	
In process, August 31	Р 8,400	
Cost from preceding department	7,200	
Materials	1,696	17,296
Overhead	<u> 1,070</u>	P 264.116
Total costs as accounted for	The second secon	1
Computations: - Units cost		10,50
Cost from preceding department =	13,500 + 81,000	10,50
	9,000	0.00
Materials =	9,000 + 72,000 =	9,00
	9,000	10.60
Labor & overhead =	5,036 + 83,580 =	10.60
Editor & Overhold	8,360	
	and a fe	
Towns all and the AM Colored		
Journal entries – Weighted Average	E. C.	
1. Work in process – Department 2	81,000	
	0	1 1100

1. Work in process – Department 2 Work in process – Department	nent I	81,000	81,000
2. Work in Process – Department 2  Materials  Payroll/Factory Overhead	l Applied	155,580	72,000 83,580
3. Finished Goods	662.3	246,820	in philips
Work in Process – Depart	ment B	90 2	246.920

#### b. FIFO method

#### LMN COMPANY

Cost of Production Report for the month ended August 31, 2019

		Materials Labor &	OH
Quantity	Actual	$\underline{WD}$ $\underline{EP}$ $\underline{WD}$	EP
Units in process, beg.	1,000	the second of the second of the	
Units received	8,000	aranabab/	
	9,000	a satisfy of page 1.	
Units completed		and the second second sections	
IP, beg.	1,000	- 60%	600
Rec'd & comp.	7,200	1000/	7,200
Units in process, end	800	100% 800 20%	160
and a company	9,000	0.000	
		2,500	<u>7,960</u>

# Costs charged to the department

Cost-in process, beg.	A Market S.	P 27,536	· · · / · · //	
Cost from preceding department		81,000	P 10,125	
Cost added in the department	ere I X	01,000	1 277	
Materials	ale he de	72,000	9.00	
Labor & Overhead		83,580	10.50	
Total cost added in the departme	ent	155,580	19.50	
Total costs to be accounted for	an Jena des	P 264,116	P 29,625	
Costs accounted for as follows:				
Completed & transferred			ga nakabin	
From IP, beg.				
Cost last month	A p	27.536	Las miller della	
Cost added this month	1 to the con			, Não
Materials	Property and a second			
Labor & overhead		6,300 P 3	3,836	
soul and more of a group of the despending	Mary Mary The		13,300 P 247,13	36
In process, end		a d		11 1
Cost from preceding department			8,100	
Materials			7,200	
Labor & overhead			1,680 16,9	80
Total costs as accounted for			P 264.1	16
			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	

#### Computations: - Unit cost

Cost from preceding department = 
$$\frac{81,000}{8,000} = 10.125$$

Materials =  $\frac{72,000}{8,000} = 9.00$ 

Labor & overhead =  $\frac{83,580}{7,960} = 10.50$ 

Journal entries - FIFO	81,000
1. Work in process - Department 2 Work in process - Department 1	155,580
2. Work in Process - Department 2	72,000 83,580-
Materials Payroll/Factory Overhead Applied  3. Finished Goods Work in Process – Department B	246,820 246.920

#### **ILLUSTRATIVE PROBLEM 3**

The following data were taken from the books of Denver Company which manufactures a single product through a two-department manufacturing process machining and finishing. In the production process, materials are added to the product at the beginning in both departments. Normal spoilage occurs in the finishing department, and the spoiled units are not detected until units are completed and inspected.

•	Mac	hining		Limsimig	
Unite	Depa	rtment	Ξ	Departmer	1
Units:		0		20,000	
Beginning inventory		0.81.1		50%	
Stage of completion		0		60,000	
Transferred in		0		00,000	
Started in production		,000		. 0	
Transferred out	60,	,000		60,000	
Ending inventory	20.	,000		18,000	
Stage of completion	16.00	25%		70%	
Spoiled (lost) units		0		2,000	
Beginning inventory costs:					
Direct materials	(	0	P	28,000	
Conversion costs	(	0		27,500	
Prior department costs		0		118,000	
Current costs:				•	
Direct materials	P 320	0,000	lin.	90,000	
Conversion costs	130	0,000		193,800	

Requirements: Prepare cost of production report for April, 2019 using:

- 1. FIFO method
- 2. Average method

# SOLUTION 1. FIFO METHOD

# DENVER COMPANY Cost of Production Report for the month ended April 30, 2019 Machining Department

		Mat	erials	Labor &	c OH
Quantity Schedule	Actual	WD	EP	$\overline{\mathrm{WD}}$	EP
Units started	000,08	efet	-		-34
		6.37			•
Units completed					Laboration of the
From IP beg.	1 1-11			2.34.22.3	
Started & comp.	60,000	100%	60,000	100%	60,000
Units IP, en i	20,000	100%	20,000	25%	5,000
113	80,000		80,000		<u>65,000</u>
Costs charged to the	department				Man to the second
Cost - in process,	beg.		Ρ .	nechas s	P -
Costs added in the	e department				
Materials			320,00	0	4.00
Conversion	costs		130.00	00	2.00
Total costs a	ıdded	TAKE THE	450,00	00	6.00
Total costs to be	accounted for	<u>P</u>	450,00	<u>)0</u> ]	$e^{-6.00}$
Costs accounted for	and the second second			1,36	
Completed & tra					mata da benga and
From IP, be		P	-		bys about 14.0
Started & co		·	360,0	00	P 360,000
In process, end	,				
Materials			80,0	000	
Conversion	costs		10,0	000	90,000
Total costs as ac			,		P 450,000
Total costs as ac	Counted for	1	s s		1 30 00 1030
Comment of the feet of the feet	naat			1	151-21-6
Computations: - Unit		= 320 0	000 = 4.	00	
Materials	1121	80,0		14 <u>4</u>	
		50,0	00		
		120.0	000 = 2	00	
Conversion	costs	= 130,0			y Kadime Ja
The following the control of the con	TREETS IN THE	65,0	JUU		

Finishing Department							Laha	. g. c	777	
			Ma	terial	S	T.D.	Labo	av i e e e e		
Quantity Schedule	Actua	1		$\overline{\text{WD}}$		<u>EP</u>	_	WD		<u>EP</u>
TT . TT	),000	1000								1
T Im ta	),000									
-	0.000									
Units completed	<u>,,000</u>									,
775 1	000			,	_		50%	ó	10,0	00
Roo'd B	),000		100%	/.	40,0	00	100%	ó	40,0	
	0,000				18,0		70%		12,6	-
I Imid 1	3,000		100%				100%			
Units lost	2 <u>,000</u>		100%	o .	2.0		1007	O	2,0	
80	<u>),000</u>				<u>60,0</u>	<u>UU</u>			64,6	<u>u</u> 0
Costs charged to the department										
Cost - in process, beg.			<u>P</u>	173,	<u> 500</u>					
Cost from preceding department	at·			360,	000		P	6.00		,
Cost added in the department	70									
Materials				90,	000			1.50		
Conversion costs				193,				3.00		
Total costs added			face	283,				4.50		
Total costs to be accounted for			P	817.			4	0.50		
Costs accounted for as follows:							1 1 10	3.1		
Completed & transferred										
From IP, beg.										
Cost last month	P	1	173,	500		H Olek				
Cost added this month	, *		175,	200						
Conversion cost			20	000		210	i areo:			
Received & completed	_		30,	000	P		,500			
In process, end						441	,000	P	644	,500
		,								,
Cost from preceding dept.						108	,000			
Materials							,000			
Conversion costs						×	,800		172	<u>800</u>
Total costs as accounted for		, 1				<u> </u>	.000	P		300
	•							<u> </u>	01/	,000
Computations: - Unit cost								H FT.		
Materials	90,00	0	=	1.50						
MO.	60,00	0			1000					
Conversion costs	193,00		=	3.00	١		ring w			
	64,60			0.00						
	,50	•								

Completed & transferred =  $(40,000 \times 10.50) + (2,000 \times 10.50)$ 

# Journal entries - FIFO

<i>1</i> .	Work in Process – Machining Dept. Work in Process –Finishing Dept. Materials	320,000 90,000	400,000
<i>2</i> .	Work in Process- Machining Dept Work in Process – Finishing Dept. Payroll/Factory Overhead Applied	130,000. 193,800	323,800-
3.	Work in Process – Finishing Dept.  Work in Process – Machining Dept.	360,000	360,000
4.	Finished Goods  Work in Process – Finishing Dept.	644,500	644,500

#### 2. AVERAGE METHOD

#### DENVER COMPANY

Cost of Production Report for the month ended April 30, 2019 Machining Department

		Materia	ls	Labor &	OH
<b>Quantity Schedule</b>	Actual	$\underline{\mathrm{WD}}$	<u>EP</u>	WD	EP
Units in process, beg.	_		11615	1874	1 · 8
Units started	80,000				
	80,000				9
Units completed	60,000	100%	60,000	100%	60,000
Units in process, end	20,000	100%	20,000	25%	_5,000
	80,000		80,000		65,000
	77				

#### Costs charged to the department

Cost added in the department			terpresent to the
Materials	P	320,000	P 4.00
Labor & overhead	1	130,000	2.00
Total cost added		450,000	6.00
Total costs to be accounted for	P	450,000	P 6.00

						P 36	60,000
Costs accounted for as follows:						r	70,000
Completed & transferred							
In process, end		P	80	0,000			000
Materials		r		0.000			00,000
Labor & overhead		-		-	the fact of	<u>p</u> 4.	50,000
Total costs as accounted for							
			190				۵
Finishing Department				10.7	ale	Labor	<u>&amp; OH</u>
I titistimg Bobattaness				<u> Aateri</u>	CD CD	$\overline{ ext{WD}}$	EP
Quantity Schedule	Actual		WI	2	<u>EP</u>	11.22	
	20,000						
Units in process, beg.	60.000				A		
Units received	80.000				5 5 4	1000/	60 00v
** **	60.000		100	)%	60,000	100%	60,000
Units completed	18,000		100		18,000	70%	12,600
Units in process, end			100		2,000	100%	$_{2,000}$
Units lost	2,000		100	,,,	80,000		<u>74,600</u>
	<u>80,000</u>				222		
Costs charged to the department							
Cost from preceding departn	nent		n	110	000	70.	
IP, beginning	The state of		P		000	77	
Transferred in during th	e month			360.		D 5	0750
		100	1 6	478.	000	<u>P</u> 5.	.9750
Cost added in the departmen	t						
IP, beginning			136				
Materials				28,	,000		
Labor & overhead				27,	,500		
Added during the month	1				•		
Materials				90	000	1	.4750
Labor & overhead					800		.9665
Total cost added			2				
	~ ·		<u></u>		300		.4415
Total costs to be accounted for	J(		<u>P</u>	81/	<u> 300</u>	<u>P 10.</u>	<u>4165</u>
Costs accounted for as follows:							
Completed & transferred					er all day'r	D C	15 922
In process, end						P 6	45,823
Cost from preceding dep	nartment		Р	10~	F F 6		
•	or enticill		r		550		
Materials	1 2			26,	,550		
Labor & overhead			- 27	37.	377	d there	71,477
Total costs as accounted for			1.1.		t <sub>R</sub>		17.300
						<u> </u>	

Computations: - Units cost Cost from preceding dept.	After a device part of the problem.
Produing dept.	$\frac{478,000}{80,000} = 5.9750$
Materials	$\frac{28,000 + 90,000}{80,000} = 1.4750$
Labor & overhead	$\frac{27,500 + 193,800}{74,600} = 2.9665$

# Journal entries - Average

Want to D

1.	Work in Process – Machining Dept.	320,000	
	Work in Process -Finishing Dept.	90,000	
	Materials		400,000
<i>2</i> .	Work in Process- Machining Dept	130,000.	
	Work in Process - Finishing Dept.	193,800	
	Payroll/Factory Overhead Applied		323,800-
3.	Work in Process - Finishing Dept.	360,000	
	Work in Process – Machining Dept		360,000
4.	Finished Goods	645,823	
	Work in Process - Finishing Dept.		645,823

Completed & transferred =  $(60.000 \times 10.4165) + (2,000 \times 10.4165)$ 

For the machining department, the cost of production report using FIFO and weighted-average are the same because there are no beginning inventories. The equivalent production and the allocation for costs to units transferred out and to ending inventory are identical whether FIFO or weighted-average is used. (Recall that these methods are different only because the weighted-average method computes unit costs using a weighted average of beginning inventory and current period amounts.) If there is no beginning inventory, then the weighted-average amounts are just the current period amounts.

178,663

Total costs as accounted for

The weighted-average cost of production report for the finishing department is different from cost of production report using FIFO because there are beginning inventories (vital) inventories (which have different unit costs than the current period unit costs). The differences are in computing unit costs and assigning total costs to good units transferred out, and to ending inventory.

# DENVER COMPANY-LOST CLASSIFIED AS NORMAL

SAME DATA AS DENVER COMPA	( <u>1-D</u>
DISCOVERED AT THE BEGINNING	
A. FIFO METHOD	
Finishing Department	Materials Labor & OH
	CD WU
Quantity Schedule Actual	WD EF 29 MING LENGTH
Units in process, beg. 20,000	Supplied that the state of the
Units received 60.000	
80,000	
Units completed	50% 10,000
In process, beg. 20,000	100% 40,000 100% 40,000
Rec'd & completed 40,000	100% 18,000 70% 12,600
Units in process, end 18,000	10070
Units lost $\frac{2.000}{90.000}$	58,000 62,600
80,000	901 10 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Costs charged to the department	P 173,500
Cost - in process, beg.	360,000 P 6.000000
Cost from preceding dept.  Cost added in the department	Line Die Die Seign
Materials	90,000 1.551724
Labor & overhead	193,800 3.095846
Total cost added	283,800 4.647570
Adjustments for lost units	206896
Total costs to be accounted for	P 817,300 P 10.854466
	10.854400
Costs accounted for as follows:	cas man managed considering pages.
Completed & transferred	
In process, beg.	
Cost last month	P 173,500
Cost this month	30,959 P 204,459
Received & completed	<u>434,178</u> P 638,637
In process, end	1 050,057
Cost from preceding department	111,724 by many
Materials	27,931
Labor & overhead	39.008 170.66

# Chapter 11 Average and FIFO Costing

Computations: - Unit cost  Cost from preceding	i Julia	$\frac{360,000}{60,000} =$	6.00
Materials	al gi almo d Ofgani	$\frac{90,000}{58,000} =$	1.551724
Labor & overhead  Adjustment for lost units:		<u>193,800</u> = 62,600	3.095846
a. Cost from preceding dept. Units received less lost	; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	360,000 - 58,000 6.206896 -	6.00
2015	=	0.206896	
b. Cost of lost units Units received less lost		2,000 x 6.00 58,000	e di or tra
	= 1	0.206896	

Under the assumption that units lost were discovered at the beginning or during the processing, the cost of the lost unit will be absorbed by the units received less units lost (58,000) which is represented by the units received & completed and the units in process, end (40,000 + 18,000). It is assumed further that the lost units are from the units received only. However, if it is assumed that the lost units are from the in process, beginning and the received, then the denominator will include the 20,000 in process, beg. (20,000 + 60,000 less 2,000 = 78,000). Just like in the previous example where the units lost were discovered at the end, the lost units are assumed to be coming only from the received and it is for this reason why the cost of the lost units is absorbed only by the received and completed. If it is assumed that the lost units are from the in process, beg., and the units received during the period, then the in process, beg. will share in the absorption of the cost of the lost units. The in process, end will not share in the cost of the lost units discovered at the end.

Under the average method, the in process, beginning will share in the absorption of the cost of the lost units. The in process, end will share in the cost of the lost units if the lost units are discovered at the beginning or during the process. If the lost units are discovered at the end of the process, the cost will be absorbed by the completed only.

# B. AVERAGE METHOD

# DENVER COMPANY Cost of Production Report for the month ended April 30, 2019 Finishing Department

Quantity Schedule Units in process, beg. Units received Units completed Units in process, end	Actual 20,000 60,000 80,000 60,000 18,000	WI 100 100	<u> </u>	EP 60,000 18,000	Lab WD 100' 70'	%	& OH EP 60,000 12,600
Units lost	2,000 80,000			78,000			72,600
				verse Salasi la			
Costs charged to the depar							
Cost from preceding depart	iment	D	110	000			
In process, beg.	m o n + h	Р		,000 ,000			
Transferred during the	monun			,000	P	5.9	75
Cost added in the departme	nt		4/0	<u>,000</u>		3.7	<u>13</u>
In process, beg.	11 20 -1 T						
Materials			28	,000			
Labor & overhead		£	- 2	500			
Added during the month	10.4			) n			
Materials	T GARAGE,	YE .	90	,000	1.51	282	1
Labor & overhead		15		800	3.04		
Total cost added				800	4.56	_	
Adjustment for loss		VI II			0.153		*
Total costs to be accoun	ted for	P	817	300 P	10.689		_
Cost accounted for as follow	vs:						Alleria Li
Completed & transferred				J. a		ا الله ا	
In process, end	· · · · · · · · · · · · · · · · · · ·			H 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		P	641,354
Cost from preceding	g department	P	110,	308			10
Materials				231			
Labor & overhead	DATE OF	-35		407			
					1 14	<u> </u>	175,946
				15		P	817 300

Computations: - Unit cost

Cost from preceding

 $\frac{478,000}{80,000} = 5.975$ 

Materials

 $\frac{28,000 + 90,000}{78,000} = 1.512821$ 

Labor & OH

 $\frac{27,500 + 193,800}{72,600} = 3.048209$ 

Adjustment for lost units

<u>478,000</u> - 5.975 78,000

= 0.153205

200	
TRUE OF FA	ALSE
Indicate whet	her the following statements are true of false by inserting in the blank da capital "T" for true of "F" for false.
l. 2.	Using the FIFO method: If, for any period, the beginning Finished Goods Inventory is zero, then the average ending unit cost in Finished Goods Inventory is either a number between the unit cost in the beginning WIP inventory and the current period unit costs, or it is equal to the current period unit cost.  Using the FIFO method: If the units transferred out exceeds the equivalent units in WIP beginning inventory, then the unit cost of the ending WIP inventory will equal the current period unit cost.
3.	Using the FIFO method: If the beginning WIP inventory is zero, then the unit cost of units transferred out will always equal the unit costs of the units in ending WIP inventory.
4.	Using the FIFO method: The number of units transferred out equals the number of units started and completed plus the equivalent units in the beginning inventory times one minus the degree of completion.
5.	Weighted average costing combines costs and equivalent units of a period with the costs and equivalent units in beginning inventory for product costing purposes.
6.	When using the weighted-average method, the unit cost assigned to the units transferred out equals the unit costs assigned to the equivalent units in ending inventory.
	Using the weighted-average method: If the current period nit cost is greater than the unit cost of the units in the beginning inventory, then the average unit cost of the goods transferred out will exceed the current period unit cost.
	Irrespective of whether the FIFO method or the weighted-average method is used, the total costs to be accounted for are equal for any particular period.
9.	With zero beginning WIP inventory the EIFO and weighted-average

methods will assign equal peso amounts to the units transferred out and

10. With zero ending WIP inventory, the FIFO and weighted-average methods will assign equal peso amounts to the units transferred out.

the units in ending inventory.

# MULTIPLE CHOICE -THEORIES

- 1. Which of the following characteristics applies in process costing but not to job order costing?
  - a. Identifiable batches of production.
  - b. Equivalent units of production
  - c. Averaging process
  - d. Use of standard cost
- 2. An equivalent unit of material or conversion cost is equal to
  - a. The amount of material or conversion cost necessary to complete one unit of production.
  - b. A unit of work in process inventory.
  - c. The amount of material or conversion cost necessary to start a unit of production into work in process
  - d. Fifty percent of the material or conversion cost of a unit of finished goods inventory
- 3. Assuming that there was no beginning in process inventory and the ending work in process inventory is 100% complete as to material costs, the number of equivalent units as to materials costs would be
  - a. The same as the units placed in process
  - b. The same as the units completed
  - c. Less than the units placed in process
  - d. Less than the units completed
- 4. What are transferred-in costs as used in a process costing system?
  - a. Labor that is transferred from another department within the same plant instead of hiring temporary workers from the outside.
  - b. Cost of the production of a previous internal process that is subsequently used in a succeeding internal process.
  - C. Supervisory salaries that are transferred from an overhead cost center to a production cost center.
  - d. Ending work in process inventory of a previous process that will be used in a succeeding process

5. Spoilage from a manufacturing process was discovered during an inspection of work in process. In a process costing system, the cost of the spoilage would be added to the cost of the good units produced if the spoilage is

addod to	Abnormal	Normal
a	No	Yes
b	No	No
C	Yes	Yes
d	Yes	No

- 6. In the computation of manufacturing cost per equivalent unit, the weighted-average method of process costing considers
  - a. Current costs only
  - b. Current costs plus cost of ending work-in-process inventory
  - c. Current costs plus cost of beginning work-in-process inventory
  - d. Current costs less cost of beginning work-in-process inventory
- 7. When using the first-in-first-out method of process costing, the total equivalent units of production for a given period of time is equal to the number of units
  - a. In work in process at the beginning of the period times the percent of work necessary to complete the items, plus the number of units started during the period, less the number of units remaining in work in process at the end of the period times + the percent of work necessary to complete the items.
  - b. In work in process at the beginning of the period, plus the number of units started during the period, plus the number of units remaining in work in process at the end of the period times the percent of work necessary to complete the items
  - c. Started into process during the period, plus the number of units in process at the beginning of the period.
  - d. Transferred out during the period, plus the number of units remaining in work in process at the end of the period times the percent of work necessary to complete the item.

8. The units transferred in from the first department to the second department should be included in the computation of the equivalent units for the second department for which of the following methods of process costing

	FIFU	AVERAGE
a	Yes	Yes
b	Yes	No
C	No	Yes ·
d	No	No

- 9. In developing a predetermined overhead rate for use in a process costing system, which of the following could be used as the base in computing the rate?
  - a. Actual factory overhead.
  - b. Estimated factory overhead.
  - C. Actual direct labor hours.
  - d. Estimated direct labor hours.
  - e. Any of the above could be used as a base.
- 10. Which of the following statements are true?
  - I. The weighted-average method of process costing is computationally simpler than the FIFO method of process costing.
  - II. Manufacturing companies that use process costing would usually have more products than manufacturing companies that use job-order costing.
  - III. The production report prepared by companies using process costing will indicate the cost and quantity of materials purchased during the period.
  - a. I only
  - b. II only
  - c. I and III only
  - d. II and III only
  - e. I, II, and III

11. Which of the following statements are FALSE?

A firm uses the weighted-average method of process costing and all materials A tirm uses the weighted-average incompution process. When computing are added at the beginning of the production process. When computing are added at the beginning of the production for materials, total equivalent units will equal equivalent units of production for materials, total equivalent units will equal

II. Unit costs under the weighted-average method will always be greater than

unit costs under the FIFO method.

- III. The only difference between weighted-average and FIFO methods of process costing is in the treatment of beginning work in process.
- a. none are false,
- b. I only
- C. II only
- d. II and III only
- e. I, II and III
- 12. Which of the following are needed to calculate the cost assigned to ending work in process under the FIFO method of process costing?

	Unit Cost	Equivalent Units	Cost-IP beg.
a	No	. No	Yes
b	Yes	No	No
c	Yes	Yes	No
d.,	Yes	Yes	Yes

- 13. Which of the following statements are FALSE?
  - I. The final step in a process costing production report is the calculation of the unit costs.
  - II. For cost control, the FIFO method of process costing is better than the weighted-average method.
  - III. The weighted-average method of process costing will always assign more cost to units completed & transferred than the FIFO METHOD.
  - a. I only
  - b. II only
  - c. I and III
  - d. I. II, and III

- 14. Beginning WIP is 45% complete, and ending WIP is 10% complete as to conversion costs. Materials are added at the beginning of the process. If a company uses weighted-average, the total equivalent units for materials will equal:
  - a. EU to complete beginning inventory.
  - b. Units started into the process this period.
  - c. Units started into the process this period plus units in beginning inventory.
  - d. Units transferred out.
- 15. In comparing the FIFO and weighted average methods for calculating equivalent units.
  - a.. The FIFO method tends to smooth out costs more over time than weighted average method.
  - b.. The weighted average method is more precise than the FIFO mehod because the weighted average method is based only on the work completed in the current period.
  - c.. The two methods will give similar results even if physical inventory levels and production costs (materials and conversion costs) fluctuate greatl from period to period.
  - d. The FIFO method is better than the weighted average method for judging the performance in a period independently from performance in preceding periods.

#### **PROBLEMS**

Problem 1
A company's records show the following information concerning the work in process

in a chemical plant. a. Beginning inventory - 10,000 units (materials are 80% complete; conversion

costs are 60% complete).

b. Transferred out - 50,000 units

c. Ending inventory - (materials are 50% complete, conversion costs are 40% complete).

d. Started this month - 45,000 units.

#### Requirements:

1. Compute the equivalent units for materials and conversion costs using FIFO.

2. Compute the equivalent units for materials and conversion costs using Average.

#### Problem 2

A company's records show the following information concerning the work in process at an assembly plant:

- a. Beginning inventory (materials are 60% complete; conversion costs are 75% complete).
- b. Transferred out 50,000 units.
- c. Ending inventory 10,000 units (materials are 60% complete; conversion costs are 80% complete.
- d. Started this month 45,000 units.

#### Requirements:

1. Compute the equivalent units for materials and conversion costs using FIFO.

2. Compute the equivalent units for materials and conversion costs using Average.

Problem 3

A company uses the FIFO method to account for its work in process inventories. The account records show the following information:

Beginning work in process inventory

Materials	
Conversion costs P	360
Debits to work in process inventory this period:	180
Materials	3,714
Conversion costs	2,258
Units:	2,200
Beginning inventory	300 units
Percent of completion (materials, 60%, conversion cost	, 30%)
Started this period	2,000 units
Ending inventory	600 units
Percent of completion: (materials, 40%, conversion cost	20%)

#### Requirements:

- 1. Compute the equivalent units for materials and conversion costs.
- 2. Compute the unit cost for materials and conversion costs.
- 3. Compute the cost of goods transferred out.
- 4. Compute the cost of the ending inventory.

#### Problem 4

The beginning work in process inventory showed a balance of P48,240. Of this amount, P16,440 is the cost of direct materials, and P31,800 are conversion costs. There were \$,000 units in the beginning inventory that were 30% complete with respect to both direct materials and conversion costs.

During the period, 17,000 units were transferred out and 5,000 remained in the ending inventory. The units in the ending inventory were 80% complete with respect to direct materials and 40% complete with respect to conversion costs.

Costs incurred during the period amounted to P126,852 for direct materials and P219,120 for conversion costs.

Requirements: Compute for the following using FIFO and Average

- 1. Equivalent production for materials and conversion costs.
- 2. Cost per equivalent unit for materials and conversion costs.

Problem 5
Auto Novelties, Inc. manufactures a small robot that can be moved around by remote Auto Novelties, Inc. manufactures a small rule food and drinks to guests, and with a control. It can be used as a novelty to serve food and drinks to guests, and with a control. It can be used as a noverty to some The materials are all added at the special attachment it can vacuum the carpet. The materials are all added at the special attachment it can vacuum une carpet operation). Labor and overhead are beginning of the Assembly Operation (the first operation). Labor and overhead are beginning of the Assembly Operation (the added are added uniformly during the month... Data for the month of July in the Assembly Operation are given as follow

15,000 Units Work in process, July 1 250,000 . Units started in process Costs Work in process, July 1 210,000 P Materials 60,000 Labor and overhead July costs: 3,500,000 Materials 1,458,000 Labor and overhead

The inventory of work in process on July-1 was complete as to materials but only 2/3 complete as to labor and overhead. On July 31, the inventory consisted of 20,000 units that were 40% complete with respect to labor and overhead.

Required: Using average method and FIFO method compute for

- 1. Equivalent production for materials, labor and overhead
- 2 Unit cost for materials, labor and overhead
- 3. Total costs of units completed ad transferred
- 4. Total costs of units in process, end

#### Problem 6

At the beginning of September, the Ellery Company had P 27,950 (direct materials -P7,800, conversion cost - P 20,150) in Department A's beginning work inprocess The inventory consisted of 15,500 units which had 100% of direct materials and 65% of conversion cost. During September, 36,000 units were started in process. Costs incurred during the month were: direct materials - P54,000; conversion costs P 79,000. As the 48,000 units were completed, they were immediately transferred to Department B. At the end of September, 3,500 were still in process and are 100% complete as to materials, and 45% converted. Required: Using average method and FIFO method determine the following

- 1. Equivalent production for materials and conversion cost
- 2. Unit cost for materials and conversion cost
- 3. Total costs of units completed and transferred 4. Total costs of units in process, end

#### Problem 7

GDL Company uses three departments to produce a detergent. The finishing department is the third stop before the product is transferred to storage...All materials needed to give the detergent its final composition are added at the beginning of the process in the Finishing Department. Any lost units occur only at this point and are considered to be normal. The following data for the Finishing Department for October have been made available.

#### Production data:

In process, Oct. 1 (labor & overhead, 3/4 comp)	10,000 units
ransiened in from preceding department	40,000 units
Finished and transferred to storage	,
In process Oct 21 (1.1.	35,000 units
In process, Oct 31 (labor & overhead, 1/2 comp) 10,000 units	
Additional Gata;	
Work in process inventory, October 1	
Coat C	

Work in process inventory, October 1			
Cost from preceding department	Р	40,000	
Cost from this department	-	10,000	
Materials		20,000	
Labor		39,000	
Overhead		42,000	
Transferred in during October		140,000	
Cost added in this department			
Materials		70,000	
Labor	-1	62,500	
Overhead		30,000	
		,	

#### Requirements

- 1. Cost of production report using average method.
- 2. Cost of production report using FIFO method

#### Problem 8

Nofat Company produces a product in three departments. The product is cut out of sheet metal in the Cutting Department, then transferred to the Forming Department, where it is bent to shape and certain parts purchased from outside vendors are added to the unit. Finally, the product is transferred to the Finishing Department where it is painted and packaged. The company uses a process costing system with an average cost flow assumption to account for its work in process inventories. Materials are added at two different stages in the Forming Department. Material A is added at the beginning of the process, and Material B is added at the end of the process. At the end of May, there were 600 units in process in the Forming Department, 50% complete as to labor and overhead. During June, 3,900 units were received from the cutting Department, and 4,100 units were completed and transferred to the Finishing Department. At the end of June, there were 400 units still in process in the Forming

	i.	
and analote as to labo	oor and overhead. Cost data related to June	
operations in the Forming Department	Beginning Invty. Added this period	
Costs charged to the department	P 9,090 P 67,410	
Cost from preceding dept.	4,000 21,200	
Material A	16,400	
Material B	1,340 $17,650$	
Conversion cost	P14,430 P.122,660	

Requirements

1. Equivalent production for Material A, Materials B and conversion cost

Total costs of the units completed and transferred

3. Total costs of the units in process, end

#### Problem 9

Alonzo Manufacturing uses a process costing system to accumulate costs related to the production of "Supergrow" an industrial strength hair grower. Material costs and conversion costs for last quarter are provided below:

ing tanggal ang ang tanggal and d	<u>Materials</u>	Conversion
Costs in beginning work in process	P 6,544	P 16,803
Current costs for the quarter	281,656	344,817

The equivalent bottles of production under the weighted average method are 262,000 for materials and 258,300 for conversion costs. All materials are added at the beginning of the production process. Beginning work in process was composed of 3,600 bottles that were 80% complete with respect to conversion costs.

#### Required:

- 1. If the number of bottles completed during the quarter is 255,200, what is the total cost that should be assigned to these bottles under the weighted average
- 2. If Alonzo had used the FIFO method, total cost assigned to ending work in process would have been P 11,597. If bottles completed during the quarter are 255,200, what is the total cost that should be assigned to the completed

#### Problem 10

The addition of water at the start of the process in Dept. B of Nicole Mfg. Co. increases the quantity by 5%. The following data pertain to its production for March, 2019

#### Quantity data:

In process, March 1 (3/4 incomplete)	12,000 units
transferred in	80,000 units
In process, March 31 (2/5 complete)	10,000 units

Cost data Cost from Dept. A Cost in Dept. B	In Process, beg. P 11,800	Added during the month P 86,120
Materials	3,125	21,835
Labor	1,490	43,510
Overhead	1,320	34,680

Materials are added at the start of the process while conversion costs are applied evenly. The company is using the weighted average method

#### Requirements

- 1. Equivalent production for materials, labor and overhead
- 2. Total costs of the units completed and transferred
- 3. Total cost of the units still in process at the end of March

#### Problem 11

During February, the Assembly Department received 60,000 units from the Cutting Department at a unit cost of P3.54. Costs added in the Assembly Department were: materials, P 84,370; conversion costs, P 129,710. Of the 60,000 units received, 50,000 were transferred out; 9,000 units were in process at the end of the month (all materials, ½ converted. The entire loss is considered abnormal and is to be charged to factory overhead. Inspection is done at the beginning of the process.

#### Required:

- 1. Equivalent production for materials and conversion costs.
- 2. Total costs charged to factory overhead for the lost units.
- 3. Costs of the units completed and transferred
- 4. Costs of the units in process, end

Problem 12 icole Company employs a process costing system. A unit of product passes through icole Company employs a process costing system. A unit of product passes through three departments – Molding, Assembly, and Finishing, before it is completed. The following activity took place in the Finishing Department during May: Work in following activity took place in the Finishing Department – 14,000; process, May 1 – 1,400 units; transferred in from the Assembly Department – 11,200. spoilage – 700; completed and transferred to finished goods inventory – 11,200. spoilage – 700; completed and transferred to finished goods inventory – 11,200. spoilage – 700; completed and transferred to finished goods inventory – 11,200. spoilage – 700; completed and transferred to finished goods inventory – 11,200. spoilage – 700; completed and transferred to finished goods inventory – 11,200. spoilage – 700; completed and transferred to finished goods inventory – 11,200. spoilage – 700; completed and transferred to finished goods inventory – 11,200. spoilage – 700; completed and transferred in processing processed. Conversion costs on complete as to conversion costs on complete as to conversion costs in May 1 and 40% complete as to conversion costs on cos

#### Required:

- 1. Cost of the units completed and transferred
- 2. Cost charged to factory overhead control
- 3. Cost of the units in process, end

#### Problem 13

Samahan, Inc. manufactures a highly sensitive smoke alarm and uses the FIFO method. In costing finished goods, the unit costs for units completed from the work-in-process at the beginning of the period is kept separate from the unit cost of those started and completed during the period. The total manufacturing costs for the month of June, 2016 is P264,000 and 2,750 units are completed during the month.

The inventories at the beginning pf June are:

Smoke alarm in process (80% complete) Smoke alarms on hand (complete) The inventories at the end of June are:	1,250 units P128, 600 units 76	000
Smoke alarm in process (50% complete) Smoke alarms on hand (complete)	500 units 700 units	

#### Required

- 1. Total cost of the units in process, end
- 2. Cost of finished goods inventory at the end
- 3. Total costs of the units sold

Som All with

#### Problem 14

The following were taken from the books of Michelle Company for the month of June, 2019. The company uses FIFO in costing finished goods and goods sold

Inventories, June 1	Materials	P 50,000
	Finished goods (5,000 units)	75,000

The transactions for the month of June are as follows:

1. Purchased materials on account, P 180,000

2. Issued materials - Dept. 1 P 90,000, Dept. 2 - P 112,500

3. The total payroll for the month amounted to P 135,600 distributed as follows:
Dept. 1-P 64,800, Dept. 2-P 61,600 and the balance - indirect labor

4. Factory overhead applied amounted to Dept 1 – P 59,400; Dept. 2 – P 50,600

ten 2. di p. 1. Laggera wed openifi<mark>ang haba</mark>enda, gatvenba ga 1697) di 1941. Til Laggera del 1650 ond nadiose di 1963, gat

Alasah Sono nga saris (nga saningmau - na din din sain sasa sas

5. Units completed and transferred to finished goods - 40,000

6. Sold 25,000 units at P 400,000

QUANTITY DATA	DEPT. 1	DEPT. 2
Units started	60,000	Spire frie
Units completed	45,000	40,000
Stage of completion	60%	80%

Materials, in both departments, are added 100% at the beginning

#### Requirements:

- 1. Journal entries to record the above transactions
- 2. Cost of units completed and transferred Dept. 1
- 3. Cost of units completed and transferred Dept. 2
- 4. Cost of goods sold statement

#### MULTIPLE CHOICE

Highland, Inc. uses a process costing system. The following data are available for one department for October, 2019:

	4 (190)	PERCENT COMPLETE
· · · · · · · · · · · · · · · · · · ·	UNITS	MATERIALS CONVERSION COST 60% 30%
Work in process, beg. Work in process, end	10,000 5,000	80% 70%

The department started 45,000 units into production during the month and completed and transferred 50,000 units to the next department.

- 1. Assuming a weighted-average method of accounting for units and costs, the equivalent units for material for October would be
  - a. 54,000 units
  - b. 50,000 units
  - c. 48,000 units
  - d. 44,000 units
- 2. Assuming a FIFO method of accounting for units and costs, the equivalent units for conversion costs for October would be
  - a. 50,500 units
  - b. 46,500 units
  - c. 44:500 units
  - d. 48.000 units

The following information pertains to the month of July for Stanley Company:

Beginning work in process inventory - P17,500 (10,000 units: 100% complete for materials, and 60% complete for labor and overhead)

Units completed - 60,000 units

Cost per equivalent unit: Materials - P2.50; Labor and overhead, P2.00)

- 3. Given the data above, the cost of units transferred out during the month is:
  - a. P 260,000.
  - b. P 242,500
  - c. P 254,500
  - d. P 250,500

The Pink Company has a process cost system and uses the weighted-average method. The following information is applicable for the month of September.

In program I	
In process, beginning	5,000
(100% complete as to materials, 30%	5,000
complete as to materials, 30%	
complete as to labor & overhead)	
Started in September	25,000
Units completed in September	
In man september	22,000
In process, end	8,000
(100% complete as to materials, 50%	nepr ot
complete as to labor & overhead)	
Costs	
In process, beginning	
Materials	P 10,000
Labor and overhead	and a section of the first file.
Add 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4,500
Added during the month	
A イニム - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	P 47,000
Labor and overhead	73,500

- 4. Based on this information, the cost of the units completed is:
  - a. P 135,000
  - b. P 113,600
  - c. P 107,800
  - d. P 120,250
- 5. The cost of the ending Work in Process inventory is:
  - a. P 27,200
  - b. P 39,200
  - c. P 21,400
  - d. P 32,400

Department A is the first stage of Lovely Company's production cycle. The following information is available for conversion costs for the month of May, 20169

Work in process, beginning (25% complete)	8,000 units
Started in May	40,000 units
Completed in May and transferred to Dept. B	38,000 units
Work in process, ending (60% complete)	10,000 units

- 6. Using the FIFO method, the equivalent units for conversion costs for the month
  - a. 42,000 units
  - b. 38,000 units
  - c. 44,000 units
  - d. 36,000 units

Minnesota Company has a process costing system in operation and uses the weighted average method to account for cost flows. The following information for the assembly department was obtained from the accounting records for September (all materials are added at the beginning of the process):

NUMBER OF UNITS

Work in process inventory, Sept. 1 (25% converted)

Transferred in during the month

Work in process inventory, Sépt. 30 (50% converted)

40,000
100,000
20,000

September costs:	Transferred	Labor &		
1	in	<u>Materials</u>	<u>O</u>	verhead
Beginning WP invty	P 80,000	P 37,600	P	5,000
Cost added - Sept.	251,000	122,400	THE P	66,500

7. The "Total cost to be accounted for" section of the Production Report for the month will show an amount equal to:

A ork in process solves 168% compress

- a. P 562,500
- b. P 231,500
- c. P 439,900
- d. P 520,000
- 8. The equivalent units for material for the month is:
  - a. 100,000 units
  - b. 120,000 units
  - c. 140,000 units
  - d. 160,000 units
- 9. The unit cost for labor and overhead for the month is:
  - a. P 0.50
  - b. P 0.125
  - . c. P 0.52
    - d. P 0.55

- 10. The equivalent units for conversion costs equaled 47,500 units. The beginning inventory consisted of 15,000 units, 60% complete. The ending inventory consisted of 10,000 units, 75% complete. Assuming a FIFO basis of computing equivalent units, the number of units started during the month was
  - a. 41,500 units
  - b. 31,000 units
  - c. 44,000 units
  - d. 34,000 units

Charlene Casuals, Inc. uses a process costing system to accumulate costs related to silk scarf production. Selected data for scarf production for last quarter is provided below:

	Materials	Conversion C	ost
Units cost, FIFO method	?	P 2.25	
FIFO equivalent units	4,200	4,500	
Cost in beginning work in process	P 630	P 270	
Total cost to be accounted for	P24.780	??	

11. What are the unknown amounts above?

		?		??
a.	P	5.75	P	2,270
b.	P	5.75	P	10,395
c.	P	5.90	Ρ.	2,000
d.	P	5.90	P	10,395

Use the following information for questions 12 to 15

Beginning inventory:

Prior department costs	<b>P</b> .	4,800	3,000 units
Materials		1,080	20% complete
Conversion costs		600	25% complete
Current work:		v	a feet man to the season of the
Prior department costs	P	9,600	8,000 units
Materials		20,460	um end en lawe
Conversion costs		7,640	
8,000 units were started this pe	riod	anu 62001	helianod abtend

The ending inventory has 2,000 units, which are 45% complete as to materials, 65% complete with respect to conversion costs. FIFO costing is used

12.	What are the total units to be accounted for	or?	
1 101	a. 8,000 units		
	b. 10,000 units		
		A.100	dia k
	c. 11,000 units		
12	d. 13,000 units  How many units were started and comple	eted this period?	
13.	How many units were started and compa		
	a. 6,000 units		
	b. 8,000 units		
	c. 10,000 units	in min botoples and	
	d 11 000 units		
14.	What are the equivalent units produced for	or materials:	
	a. 6,000 units	hamprida 4	
	b. 8,000 units		
	c. 9,300 units		
•	d. 9,900 units		
15.	What are the equivalent units produced for	or conversion costs?	
101	a. 8,000 units	The state of the s	
	b. 9,300 units		
	c. 9,550 units		
	•	00 5 3 3 65	
	d. 10,300 units	61.01 4 00	
For	the month just ended, the following data	were generated by Alor	nzo Corporation
Phy	vsical units		14 000 11
	Units in process, beg.	The state of the s	4,000 gallons
4	Materials, chemicals (? complete)	1800 DOLLAR	
	Materials, cans (0% complete) Labor and Overhead (25% conver	rted)	
	Started in process	denotembres	21,000 gallons
	Transferred to shipping		20,000 gallons
	In process, end	The species were	10 10 10
	Materials, chemicals (100% comp	olete)	
	Materials, cans (? complete)		
100	Labor and overhead (80% comple	ete) - personers of rises	

Cost for the month

Cost to the month	
Work in process, beg.	
Materials, chemicals	P456,000
Labor (P100 per hour)	62,500
Overhead	18,750
The month's cost added	94 . 7 1 . 1917 5
Materials, chemicals	2,284,000
Materials, cans	
Labor	350,000
Overhead	105,000

The company manufactures high quality paints. Production begins with the blending of the various chemicals, which are added at the beginning of the process and ends with the canning of the paint. Canning occurs when the mixture reaches the 90% stage of completion. The gallon cans are then transferred to the Shipping Department for crating and shipment. Direct labor and overhead are added continuously throughout the process. Overhead is allocated on the basis of direct labor hour at the rates of P30 per hour.

- 16. Using the weighted average method, the cost per equivalent unit for direct materials, cans amounted to
  - a. P3.50
  - b. P3.33
  - c. P2.80
  - d. P2.92
- 17. Using the weighted average method, the cost of overhead in the work in process, end amounted to
  - a. P20,625.00
  - b. P24,516.00
  - c. P23,125.70
  - d. P25,781.26
- 18. Using the weighted method, the cost per equivalent unit for direct materials, chemicals amounted to
  - a. P109.60
  - b. P 91.36
  - c. P108.76
  - d. P130.48

The Alecks Company manufactures one product that passes through three departments in a continuous process. For the month of July, P46,500 of direct department in a continuous process. For the month of July, P46,500 of direct labor was incurred in Department A. materials were issued and P85,600 of direct labor cost. The work in process in The factory overhead rate is 75% of direct labor cost. The work in process in Department A was P26,200 at the beginning of the month and P22,400 at the end of the process.

19. The cost of the units transferred to Department B is

a. P200,100

b. P192,300

c. P196,300

d. P222,500

During March, 2019, Blanche Company's Department equivalent units costs were computed as follows

Materials P1.00
Conversion costs 3.00

Materials are introduced at the end of the process in Department Y. There were 4,000 units (40% complete as to conversion cost) in process at March 31, 2016.

- 20. The total costs assigned to the March 31, 2016 work in process inventory should
  - a. P4,800
  - b. P8,800
  - c. P7,200
  - d. None of the given

Marvin Company's production process starts in the Compounding Department. The following information for the month is provided.

Work in process, beginning (50% complete)

Started during the month

Work in process, ending (60% complete)

40,000 units
240,000 units
25,000 units

Direct materials are added at the beginning of the process in the Compounding Department.

- 21. Using the average method, the equivalent units of production (direct materials and conversion costs) for the month is
  - a. 280,000 and 270,000
  - b. 270,000 and 280,000
  - c. 240,000 and 250,000
  - d. 255,000 and 255,000

Motus Wonder Drug Company manufactures "Milagro" from the following successive processes: Extracting, Mixing and Packaging. Materials are added in the Mixing Department in the form of additives. Motus uses the average cost method in accounting for work-in-process. Pertinent information from the Mixing Department during May, 2019 show:

Cost charged to Mixing	Beginning Inventory	Added in May:
Cost from Extracting	P29,120	P251,680
Direct materials	4,940	41,860
Direct labor	1,560	40,560
Factory overhead	3,120	81,120

Also during the month, Mixing had units in beginning inventory of 1,000; transfers from Extracting of 2,000 units added to process in the Mixing Department of 6,000; transfers to Packaging of 7,800; and units in ending inventory (100% materials and 50% labor and overhead) of 1,200.

22. What are the total equivalent units for (1) materials, (2) labor and (3) overhead in the Mixing Department?

a. (1) 7,800 (2) 7,800 (3) 7,800 b. (1) 7,800 (2) 7,500 (3) 7,500 c. (1) 1,200 (2) 300 (3) 300

d. (1) 9,000 (2)8,400 (3) 8,400

The Extracting Department is the first stage of Norman's manufacturing cycle. Here, materials are added at the beginning of the process. Pertinent data on Extracting Department for May, 2016 show: work in process, beginning (60% complete) of 100,000 units; production started during the month of 600,000 units; work in process, ending (70% complete) of 52,500 units. Norman uses the weighted average method.

23. What are the equivalent units of production for (1) materials and (2) conversion costs, respectively, for May, 2019?

a. (1) 637,500 (2) 446,250 units

b. (1) 600,000 (2) 420,000 units

c. (1) 700,000 (2) 684,250 units

d. (1) 62,500 (2) 43,750 units to be death of the real line of the set to the

Production in July resulted in 100 lost units of which 60 was considered normal and 40 abnormal. The 100 units were complete with respect to materials but only 40 percent complete with respect to labor and overhead. Unit cost for materials, labor and overhead were P10, P15 and P9 respectively. The unit costs have been determined after including normal and abnormal lost units separately in the computation of total equivalent units.

24. The cost of lost units charged to factory overhead would be:

- a. P2,040
- b. P1,176
- c. P1,360
- d. P 784

Gardenia Company uses the weighted-average method. It had P8,000 of conversion cost in the beginning Work in Process Inventory and added P64,000 of conversion cost during 2019. The company completed 40,000 equivalent units for conversion costs during the year. The company had 10,000 units in the ending Work in Process Inventory that were 30% complete as to conversion.

25. The amount of conversion cost assigned to the unit in process.

- a. P12,600
- b. P 5,400
- c. P11,200
- d. P 4,800

Ten-ten Company produces a small standard component in a process operation. There is a quality control check at the end of the processing. Items which fail this check are sold off as scrap for P1.80 per unit. The expected rate of rejection is 10%. Normal loss is not given a cost except that whatever scrap value it has is credited to the process account. The cost/value of the abnormal loss or gain, net of scrap, is written off to the profit and loss account.

Data for July are as follows:

Materials input

1,000 units

P5,100

Conversion cost

P3,000

Output to finished goods

800 units

- 26. What was the full cost of the finished output that passed the quality control check?
  - P7,040
  - b. P7,920
  - c. P7,200
  - d. P8,100

# Chapter 11 Average and FIFO Costing

Complete the following process account of Lei Manufacturing Company by supplying the peso amounts of (A) and (B) on the credit side of the account.

14.4 JP. 610(Car	Process	<b>Y</b> aanaa <u>ahaa</u> mo <u>a maanaaka</u> (
May 1 6,000 units 1/3 completed	P4,800	May 1-31 16,000 units completed (A)
May 1-31 Mat. 12,000 @ P0.50 Labor Overhead	6,000 3,600 5,400	May 31 2,000 units- ½ completed

- 27. The peso amount of the 16,000 units completed (A) is
  - a. P17,800
  - b. P18,200
  - c. P17,600
  - d. P16,400
- 28. The peso amount of the 2,000 units ½ completed (B) is
  - a. P2,200
  - b. P1,600
  - c. P2,000
  - d. P1,400

Krish Company has a Mixing Department and a Refining Department. Its process-costing system in the Mixing Department has two direct materials cost categories (material AA and material BB) and one conversion cost pool. The company uses first-in-first-out cost flow method. The following data pertain to the Mixing Department for October, 2019.

contracts both efficien going one come gui wellor and

Units	efairet P.	
Work-in-process, October 1: 50% completed		30,000
Warts in process October 31, 70% completed		50,000
Units started	haadrouti	120,000
Completed and transferred	anns maire	100,000
Costs	<u>4</u> 65	50 0.
Work-in-process, October 1	P	436,000
Material AA		1,440,000
Material BB		1,500,000
Conversion costs		600,000

Material AA is introduced at the start of operations in the Mixing Department, and Material BB is added when the product is three-fourths completed in the Mixing Department. Conversion costs are added uniformly during the process.

- 29 The respective equivalent units for Material AA and Material BB in the Mixing Department for October 2016, are:
  - a. Both 100,000 units
  - b. 150,000 units and 120,000 units
  - c. 120,000 units and 100,000 units
  - d. 120,000 units and 150,000 units
- 30. The cost of goods completed and transferred out to the Refining Department was:
  - a. P3,861,500
  - b. P3,201,000
  - c. P2,700,000
  - d. P3,101,000

Hannibal Co. processes its product in three consecutive departments, A, B, and C. The following data are given on the third department's production for June of the current.

Quantity data:

Qualities data.	
In process, June 1 (4/5 complete)	5,000 units
Transferred in	22,000 units
In process, June 30 (3/4 complete)	8,000 units
Cost data:	TSI DUR UN TERRE
In process, June 1	30,610
Transferred in	110,000
Cost added in June	2019
Materials Supplement MOV of medicine	15,750
Labor bulblooks NOT It redoud	
Overhead	6.300

- 31. What is the unit cost of the units completed and transferred?
  - a. P 6.45
  - b. P 1.45
  - c. P 6.44
  - d. P 6.50

Summer Company makes a single product in two departments. The production data for Department B for 2019 follows:

#### Units

In process, August 1 (40% completed)	4,000 units
Received from Department 1	30,000 units
Completed and transferred	25,000 units
In process, August 31 (60% completed)	6,000 units

Costs	In process, May 1	Added during May
Received from Dept. 1	P 14,400	P 97,200
Materials	3,800	67,500
Conversion costs	1,940	81,000

Materials are added at the start of the process and losses normally occur during the early stages of the operation.

- 32. Cost of goods manufactured using FIFO method
  - a. P 195,250
  - b. P 193,040
  - c. P 211,040
  - d. P 218,440
- 33. Cost of the ending work in process inventory using average costing
  - a. P 44,640
  - b. P 45,840
  - c. P 46,362
  - d. P 46,800

The Antipolo Company operates three successive departments. Product costs are tracked by department and assigned using process costing system. Overhead is applied to production in each department at a rate of 80 percent of the department's direct labor cost.

The T-accounts information, on the next page, pertains to departmental operations for June

11.15.1	Work in proc	ess – Strip	ing	Work in process	5 - Adnesion 00 C & T 480,000
B <b>e</b> g. DM	20,000 90,000	C& T	?	Beg. 70,000 Trans. In ? DM 22,60	00
DL FO	80,000 ?	Ending	17,000	DL ?	Ending 20,600

Work in process - Pac	Laging	The Market Har	Finished Go	Ja-see	770.000
Beg. 150,000 CofG		Beg. CofGM	185,000 880,000	Ending	770,000 ?
DM ?				1.31	
DL ?	Diff. (		1 47	Sa notre	
FO 90.000 Endir	g 40.000				

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information, on the and page, pertains to departmental aperations for

- 34. The cost of goods transferred out from the Striping is
  - a. P 173,000
  - b. P 227,000
  - c. P 237,000
  - d. P 273,000
- 35. The direct labor cost incurred in the Adhesion Dept. is
  - a. P 76,000
  - b. P 95,000
  - c. P 96,000
  - d. P 171,000

# JOINT PRODUCTS AND BY-PRODUCTS

# LEARNING OBJECTIVES

Upon completion of this chapter, you should be able to

- Define joints costs and distinguish them from common costs.
- Discuss the appropriate methods for the allocation of joint costs to joint products.
- Discuss the appropriate methods for the costing of by-products.
- Prepare the different income statements showing the revenue/net revenue from by-products.
- Discuss the effects of joint allocation upon decision making.

Joint products are individual products, each with significant sales values, which are produces simultaneously from the same raw materials and same manufacturing process. For example, soy bean oil and soy bean meat are joint products which result from the processing of soy beans. Joint products also occur in the meat packaging industry and in many natural resource refining industry. The characteristics of joint products are:

- 1. Joint products have a physical relationship that requires simultaneous common processing. Processing of one of the joint products results in the processing of the other joint products. When additional qualities of one joint product are produced, the quantities of the other joint products will increase proportionately.
- 2. Manufacturing of joint products always has a split-off point at which separate products emerge to be sold as is or processed further. Costs incurred after the split-off point do not generally cause allocation problems because they can be identified with the specific products.
- 3. None of the joint products is significantly greater in value than the other joint products this is the characteristic that distinguishes joint products from by-products.

Joint costs and the Split-Off Points

Joints costs should not be thought of as a "new" type of product costs in that day consist of direct materials, direct labor and factory overhead. A major difficulty inherent to joint costs is that they are indivisible because joint costs are not

specifically identifiable with any of the products being simultaneously produces. Additional processing costs, sometimes called separable costs, are incurred by individual products after they have emerged (called the split-off point) from the common raw materials and/or the common manufacturing process. Additional processing costs simply consists of the additional direct materials, direct labor and factory overhead incurred for the identifiable products after the split-off in contrast to the joint costs which are incurred for the benefit of all products prior to the split-off point.

Outputs of a Joint Process

A joint process produces more than one product line. A product that has a sales value resulting from a joint process is classified as (1) a joint product, (2) a by-product or (3) scrap. Joint products are the primary outputs of a joint process, each joint product has substantial revenue generating ability. Joint products are the main reason why a company enters into the production process. These products are also called the main products. On the other hand, by-product and scrap are those that come out incidental to the joint process. Both are salable, but their sales value alone would not be sufficient for management to justify under taking the joint process. For example, Dunkin' Donuts will never under take doughnut manufacturing to generate the doughnut holes (munchkins) sold to customers. Bacolod Sugar Mills would never undertake sugar cane processing simply to generate molasses.

Overtime a company can change a product classification because of changes in technology, consumer demand, or ecological factors. Some products originally classified as by-products may be reclassified as main products. For example, chicken wings are sold before at a lower price compared to legs and breast, but now they are sold at a price similar to other parts of a chicken. Some products originally classified as scrap may be reclassified as by-product. For example, chicken entrails, feet, blood and head may be classified as by-products while before they were classified as scrap.

#### **CHARACTERISTICS OF MAIN PRODUCTS**

1. The products must be the primary objective of the manufacturing operations.

Sales value must be relatively high if compared with the products resulting at the same time period.

3. In case of joint products, the manufacturer must produce all of the products through a common process.

# CHARACTERISITCS OF BY-PRODUCTS

1. The product is not the primary objective of the manufacturing operations.

2. Sales value of the by-product is comparatively low as compared with the sales value of the main product.

# ACCOUNTING FOR JOINT PRODUCTS

Joint product costs must be allocated to individual products in order to determine the ending work in process and finished goods inventories, costs of goods manufactured and sold, and gross profit. As mentioned earlier, specific identification is not possible. Therefore, an appropriate method must be used to allocate a portion of the joint costs to individual joint products. Three methods are commonly used to allocate joint costs. The physical output method is bases on volume; the other two on market values the market value at split-off method and the net realizable value method.

# ACCOUNTING METHODS FOR MAIN PRODUCTS

1. Physical output method/ Average unit cost method

2. Market value at split-off method

3. Net realizable value method (approximated market value at split-off)

Problem to illustrate the accounting methods for main products
The following information is available for the Guiller Company. Joint Costs amounted to P 164,000.

	Units	Disposal	MV at	Additional	Final
<b>Products</b>	Produced	Costs	Split-off	<b>Processing Costs</b>	MV
make the	28,000	P 4,000	P 8.00	P 50,000	P 11.50
B	34,000	1,000	7.00	30,000	10.00
$\mathbf{C}$	20,000	5,000	9.50	35,000	14.00

#### ACCOUNTING METHODS FOR MAIN PRODUCTS DISTINGUISHED

#### Physical Output/ Average unit cost method

Under this method, the quantity of output is the basis for allocating joint costs. The quantity of output is expressed in units, which may be tons, gallons, or any other appropriate measurement. The quantity of output for all the joint products must be stated in the same scale.

Joint cost is allocated to each product by a ratio of output per product over total joint product multiplied by total joint cost.

Using the information from the illustrative problem, the following joint cost allocation is made.

Product A = 
$$\frac{28,000}{82,000}$$
 x  $164,000 = P 56,000$   
Product B =  $\frac{43,000}{82,000}$  x  $164,000 = 68,000$   
Product C =  $\frac{20,000}{82,000}$  x  $164,000 = \frac{40,000}{P 164,000}$ 

The total production costs of a product are computed as follows:

	Units	Costs	Share in	Additional TotProduction
<b>Product</b>	Produced	Per Unit	Joint Cost	Processing Cost
. <b>A</b>	28,000	2	P 56,000	P 50,000 P 106,000
В	34,000		68,000	30,000 98,000
C	<u>20,000</u>		40,000	35,000 75,000
hasing in	<u>82,000</u>	(p) (mol)	P 164,000	P 115,000 P 279,000

Under this method it is assumed that all products produced by a common production should be charged a proportionate share of the joint cost based of the number of the units produced. The most appealing characteristic of this method is its simplicity, not its accuracy. The major disadvantage of allocating joint costs on the basis of quantity produced is that the revenue producing ability of the product is not considered.

#### Market Value at split-off method

This is the most popular allocation method. An argument for this method is that the selling prices of products are determined primarily by the costs involved in producing the products. Therefore, joint product costs should be allocated on the basis of the market value of the individual products.

When the market value is known at the split-off point, the total joint costs is allocated among the joint products by dividing the total market value of the joint product by the total market value of all joint products to arrive at a ratio of individual market values to total market values. This ratio is then multiplied by the joint costs to arrive at the joint cost allocation to each product.

Formula

Joint cost allocation = Total market value of each product x joint costs

Total market value of all products

The formula is applied to determine the amount of joint cost to be allocated to each joint product.

Product A = 
$$\frac{224,000}{652,000}$$
 x  $164,000$  =  $56,344$   
Product B =  $\frac{238,000}{652,000}$  x  $164,000$  =  $59,865$   
Product C =  $\frac{190,000}{652,000}$  x  $164,000$  =  $47,791$ 

The total production costs of a product are computed as follows:

Garage Control of the Control of				Total
Units MV at	Total MV	Share in	Additional	Production
Prod. Produced Split-of	f at SO	Joint Cost	<b>Processing Cost</b>	Costs
A 28,000 P 8.00	P224,000	56,344	P 50,000	P 106,344
B 34,000 7.00	238,000	59,865	30,000	89,865
C <u>20,000</u> 9.50	190,000	47,791	35,000	82,791
82,000	P 652,000	P <u>164,000</u>	P <u>115,000</u>	P 279,000

#### Net realizable value method (approximated market value at split-off)

When the market value is known at the point it should be used to allocate the joint costs, as illustrated in the previous example. However, some or all of the products are not salable at the split-off point. To be salable, additional processing cost must be incurred. When this situation exists, the next best approach is to allocate joint costs using the bet realizable method (approximated market value at split-off). Under this method, any estimated additional processing and disposal costs are deducted from the final sales value. The joint cost allocation to each product is computed based on the formula on the next page.

#### Formula :

Joint cost allocated = Total NRV of each product x Joint cost to each product Total NRV of all products

The formula is applied to determine the amount of joint cost to be allocated to each joint product.

Product A = 
$$\frac{268,000}{817,000}$$
 x  $164,000$  =  $53,797$   
Product B =  $\frac{309,000}{817,000}$  x  $164,000$  =  $62,027$   
Product C =  $\frac{240,000}{817,000}$  x  $164,000$  =  $48,176$ 

The total production costs of a product are computed as follows:

,100			14	, T. J	11/11/11/11	7	8	9
1.	2	3	4	וובב ג	Disposa	a1	Share	Total
ъ .	Units	Final	Total	Add'l	Cost	NRV	in JC	Costs
Prod.	Produced	MV	<u>MV</u>	Cost		268,000	53,797	103,797
A	28,000	11.50	322,000	50,000	.,	309,000	62,027	92,027
В	34,000	10.00	340,000	30,000	* * * * * * * * * * * * * * * * * * * *	240,000	48,176	83,176
C	20,000	14.00	280,000	35,000	- 1 -		164.000	279,000
F	<u>84,000</u>		942,000	<u>115,000</u>	<u>10,000</u>	<u>817,000</u>	T 2 V 141	$\frac{272,000}{5+8}$
			$2 \times 3$			4 - (5 + 6)	20 404	) T 0

# ILLUSTRATIVE PROBLEM 1- (no additional processing cost) Allocation of joint cost to joint products

Francis manufactures three joint products from a joint process. The following data pertains to operations of September.

Products	Units Produced	MV at Split-off
A ·	5,000	P 8.40
<b>B</b> :	3,000	6.00
C	2,000	5.00

Required: Allocate the joint cost of P 42,000 using:

- Market value method
- Average unit cost method

#### SOLUTION

# 1. Market value method

	3. S.	MV		stop to a dur-			
Product	Units	SO .	Total MV	Percentage	Share in	n Joint Cost	
A	5,000	8.40	42,000	60	P	25,200	
В	3,000	6.00	18,000	60%	hos A gala	10,800	
C	2,000	5.00	10,000	60%	7683 h (14)	6,000	
		1	<u>70,000</u>		P_	42,000	

The computation of the percentage may be done using different methods. The first method is to divide the market value of each product by the total market value: 42/70; 18/70; 10/70. If this method results in a percentage that are not exact, then the other method may be used-42/70 = 60%. The resulting percentage under the second method is actually the cost rate, therefore, the gross profit rate for all the products is the same, 40%.

#### 2. Average unit cost method

<u>Product</u>	Units Produced	Average Unit Cost	Share in Joint Cost
A Charles	5,000	P 4.20	P 21,000
ord.B	3,000	4.20	12,600
of C prompto	2,000	4.20	8,400
ment verteboh	10,000	to one to magness made	P <u>42,000</u>

The average unit cost is computed by dividing the total joint costs by the total units produced: 42,000/10,000 = 4.20

For this problem, in as much as the products are salable at the split-off point, we will not use the net realizable value method.

#### ACCOUNTING FOR BY-PRODUCTS

As mentioned before, by-products, like main products, are produced from a common raw material and/or common manufacturing process. Joint costs are not directly traceable to either main products or by-products. Since by-products are produced incidental to the processing of the main products, allocation methods differ from those used for main products. The methods of costing by-products fall into two categories; category 1, in which by-products are recognized when sold and category2, in which by-products are recognized when produced.

#### Category 1

By-products are produced incidental only to the processing of the raw materials to produce the main products. They are considered of minor importance and therefore no income is recorded from them until they are sold. Net revenue from the by-product is computed by deducting from actual sales the actual additional processing costs and marketing and administrative expenses. The net revenue may be presented on the income statement as:

- a. Other income
- b. Additional sales revenue
  - c. A deduction from the cost of goods sold of the main product

Under this method, a By-Product Inventory account is not setup. Additional processing costs are expensed when incurred and disposal costs are expensed at the time of sale.

#### Category 2

When the net by-product income is significant and therefore considered important, management may consider allocating joint cost to the by-product. The expected value of the by-product produced is shown on the income statement as a deduction from the total production cost of the main products produced. The unit cost of the main product is therefore reduced by the expected value of the by-product produced. The two methods to compute the peso amount of the by-product to be deducted from the production costs are:

- Net realizable value method
  - 2. Reversal cost method

Net realizable value method – under this method, the expected sales value of the by-product produced is reduced by the expected additional processing costs and marketing and administrative expenses. The resulting net realizable value of the by-product is deducted from the total production costs of the main product.

Reversal cost method – under this method, the expected value of the by-product produced is reduced by the expected additional processing costs, selling and administrative expenses and normal gross profit of the by-product. This is called the reversal cost method because one must work backward from the gross revenue to arrive at the estimated joint cost of the by-product at the split-off point. When additional processing costs and normal gross profit of the by-product are deducted from gross revenue, the remaining portion is the estimated cost of producing the by-product up to the split-off point.

The joint cost allocated to the production of the by-product is deducted from the total production cost of the main product and charge to a By-Product Inventory account.

**ILLUSTRATIVE PROBLEM 2** 

Green Spring Company produces product XY from a process that also yields a byproduct, Z. The by-product requires P 4,000 additional processing cost. The company decided to charge the joint cost to XY. The by-product will require selling and administrative expenses of P 1,000. Information concerning a batch produced in January 2019 follows:

Product	Units Produced	MV at SO	Units sold
XY	50,000	P 10.00	40,000
Z	20,000	1.00	15,000

The costs incurred up to the split off point are:

Direct materials	P	120,000
Direct labor	•	**
Factory overhead		100,000
actory overmean		80,000

#### Required:

- 1. Income statements showing the net revenue of the by-product using the different methods.
  - a. Additional sales revenue
  - b. Deduction from the cost of goods sold of XY
  - c. Other income
- 2. Income statement showing the net realizable value of the by-product as deduction from the total manufacturing cost of XY.

#### SOLUTION

Main product P 400,000 By-product 10,000 P 410,000  Less: Cost of Goods Sold Direct materials 120,000	LUTION	dalai en a	woda al ta	สมโรงเฉพาง เพื่อ	Net favorate in
By-product 10,000 P 410,000  Less: Cost of Goods Sold Direct materials 120,000	Sales				
Less: Cost of Goods Sold  Direct materials  120,000	Main product	$\mathcal{E}_{opt} \cdot \mathbf{p}$	400,000	3 7, 37	palas.
Less: Cost of Goods Sold  Direct materials  000,001  120,000  120,000	By-product		10,000	Blog bb/Pal	410.000
Direct materials 120,000 beed two groups to		044.001	3		•
Direct materials 120,000 Sentitive question	Less: Cost of Goods Sold	000,007			
	Direct materials	1910.08	120,000		
2 11 00 11 11 11 11 11 11 11 11 11 11 11	Direct labor		100,000		•
Factory overhead 000.00 80,000 reunal groups at least	Factory overhead	60.000	80,000	optory, Januar	. Less hw
Total manufacturing cost 300,000	Total manufacturing co	st	300,000		มใชช สะสปิ
Less: Inventory, January 3160,000240,000	Less: Inventory, Januar	ry 31	60,000	r dzinijatko bru	240,000
Gross Profit				\$nroon.	170,000
Less: Selling and administrative expenses 80,000	Less: Selling and administra	ative expe	nses	borq-yd er a	80,000
Net Income P 90,000	Net Income			P	90,000

The net revenue from the by-product is computed as follows:

Sales
Less: Add'l Processing Cost P 4,000
Selling and administrative 1,000
Net revenue of by-product

P 15,000

5,000
P 10,000

Inventory, January 31  $\frac{300,000}{50,000} \times 10,000 = 60,000$ 

# b. Net revenue from by-product shown as deduction from cost of goods sold of main product.

Sales	0.00.00	P	400,000
Less: Cost of Goods Sold	0.15.0).		1000
Direct materials	P 120,000		browney
Direct labor	100,000		
Factory overhead	80,000		
Total manufacturing costs	300,000		the state of the state
Less: Inventory, January 31	60,000		
Costs of goods sold	240,000		
Less: Revenue from by-produ	ict 10,000		230,000
Gross profit	1		170,000
Less: Selling & Administrative			80,000
Net Income	was that the section	The s	P 90,000
	1		

# c. Net revenue from by-product is shown as other income:

Sales	HI, HI		P	400,000
Less: Cost of Goods Sold	m.31			lowborto
Direct materials	P	120,000	1	
Direct labor		100,000		
Factory overhead		80,000	·	abston re
Total manufacturing cost		300,000		
Less: Inventory, January 3	1/1/2	60,000	1	240,000
Gross Profit				160,000
Less: Selling and administrativ	e			80,000
Net operating income				80,000
Add: Revenue from by-product	t ene	57 - 9 × 0 2 VI s	Town Control	10,000
Net Income			P	90,000

All three presentations under Method 1 resulted in the same amount of net income. The presentation on the income statement will not affect the amount of net income. It is only under Method 2 that the net income is affected because the total manufacturing costs was decreased and as a result, the cost of the inventory of the main product was affected and this caused the net income to decrease.

# 2. Net revenue from by-product shown as deduction from total manufacturing cost of the main product.

Sales		$\mathbf{P}^*$	400,000
Less: Cost of Goods Sold	io grapina i	_	,
Direct materials P	120,000		
Direct labor	100,000	A A ACT	
Factory Overhead	80,000		
Total manufacturing cost	300,000		
Less: Revenue from by-product_	10.000		
Net manufacturing cost	290,000		
Less: Inventory, January 31	58,000		232,000
Gross profit			168,000
Less: Selling and Administrative	Service Contraction		80,000
Net income	At the same	<u>p</u>	88,000

#### **ILLUSTRATIVE PROBLEM 3**

Monique Company manufactures product MN from a process that also produces by-product J and by-product K. The following pertains to operations for March, 2016

	MN	na Jan	K	TOTAL
Units produced	10,000	6,000	4,000	20,000
Sales price/unit	P 20.00	P 3.00	P 2.75	
Units sold	8,000	6,000	4,000	18,000
Subsequent cost	P62,300	P5,700	P 4,300	P 72,300
Selling & adm.	32,000	2,500	1,000	35,500
Desired profit	2,000	1,200	,	

#### Required:

- 1. Share of the by-products in the joint cost of P50,000 using reversal cost method.
- 2. Income statement for the main product, MN and the by-product J and K.

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#### SOLUTION.

-		referring from the med control for		المحاجات والمحادث
121 0	Ot he		nt cost using reversa	I cost methou.
2.5	Share of the her	أمأ مماله على عديدا	at cost lising reveloa	I CODE MAR

Sales	iucts in the jo	By-	Product J 18,000	i . i	<u>By</u> -	<u>-Product K</u> 11,000
Less: Subsequent cost Selling & adm. Desired profit Share in joint cost	P 5,700 2,500 2,000	garot.	10,200 7,800	P	4,300 1,000 1,200 P	6,500 4,500

### MONIQUE COMPANY Income Statement for the month ended March 31, 2019

	MN	BP-J	BP-K	Total
Sales	P 160,000	P 18,000	P 11,000	P 189,000
Less: Cost of Goods Sold	Will the			1175 1.7.
Sh. In Joint cost	37,700	7,800	4,500	50,000
Subsequent cost	62,300	5,700	4,300	72,300
Total mfg. cost	100,000	13,500	8,800	122,300
Less: Inventory	20,000		23.4	20,000
Cost of goods sold	80,000	13,500	8,800	102,300
Gross profit	80,000	4,500	2,200	86,700
Less: Selling & Adm.	32,000	2,500	1,000	35,500
Net income and assistant and	P 48,000	P 2,000	P 1,000	P 51,200
Supporting computations:	unitto de suma la	a Rajmoloj s		qiya bar Lare

Cost/unit - MN = 100,00010,000

P 10.00/unit

2,000 units x P 10.00/unit Inventory

For the by-products, the total manufacturing cost is the same as the cost of goods sold because all units produced during the period were also sold during the period. If the units produced for the period were not all sold then the inventory will be computed by dividing the total manufacturing cost by the total units produced and the resulting unit cost will be multiplied by the units remaining in the inventory.

Allocation of joint costs using market value method

Product MN BP-J BP-K	Sales Value 200,000 18,000 11,000	62,300 5,700 	Realizable <u>Value</u> 137,700 12,300 <u>6,700</u>	Fractions 1377/1567 123/1567 67/1567	Share in Joint Cost 43,937 3,925 2,138
•	189,000	72,300	156,700	6//156/	<u> 2,138</u> <u> 50,000</u>

# EFFECTS OF JOINT COST ALLOCATION UPON DECISION MAKING

The allocation of joint cost is done mainly for the purpose of product costing and should not influence management in its planning and control of joint costs and decision making. Decision making generally involves output decisions, further processing decision and pricing decision. In each of ehses, joint cost allocation is not relevant information. The very nature of main products and by-products limits the flexibility of decisions. When the products manufactured are proportionately fixed in quantities relative to each other, a decision to produce more or less of one product will result inproportionately more or less of the other product. Therefore, more useful information is obtained by comparing total input costs with the potential revenue generated from total output. When the products can be produced in alternative ratios or "mixes", the decision is based on which mix obtains the most profit. In this case, income increments are analyzed. Total joint cost allocation has no influence on the decision whether to sell at the split-off point or process further. A decision to process further depends on whether the increase in the sales value is greater that the additional cost to process further. Management decisions should therefore be based on opportunity costs rather than on the allocation of joint costs (which may be considered sunk costs for decision making purposes).

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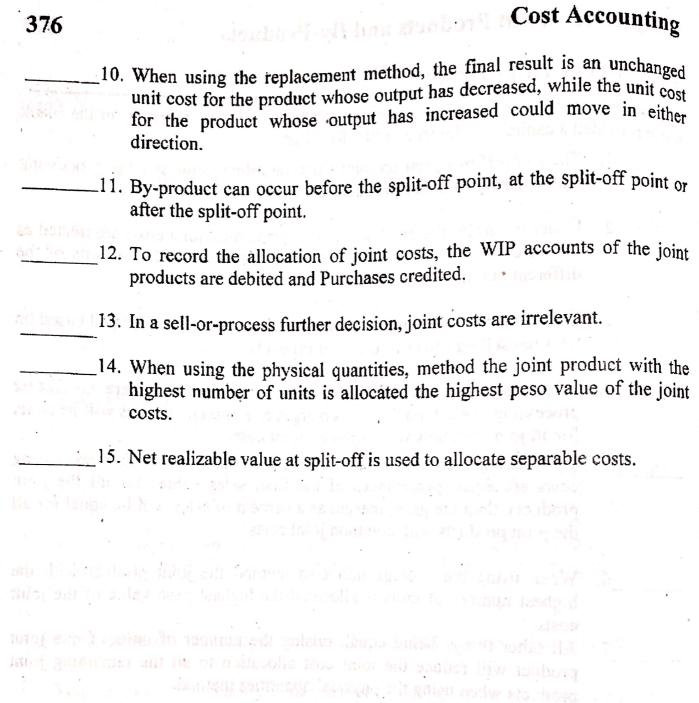
#### **QUESTIONS**

- 1. What is the difference between a joint product and a by-product?
- 2. What are the different methods of allocating joint costs to joint products?
- 3. What are the different methods of costing by-products?
- 4. If no costs are allocated to by-products as they are removed from the joint-processing center, what value will be assigned to by-products held in inventory?
- 5. What method is most commonly used for allocating joing-processing costs to joint products? Explain.
- 6. What method of allocating joint processing will give the same gross profit rate to all products?
- 7. What procedures are followed when using the relative-sales-value method of allocating joint costs if the joint products require further processing before it can be sold?
- 8. What will justify the treatment of a product as joint product? By-product?
- 9. What method of allocating joint processing will give the same units cost for all products?
- 10. If the by-product will not share in the joint cost, how do we present on the income statement the revenue from sale of by-product?

TRUE-FAI	LSE QUESTIONS beds in Transported in the Section of
Indicate who space provid	ether the following statements are true or false by inserting in the blank ed a capital "T" for true or "F" for false.
1.	The split-off in a joint product situation refers to the stage of processing where the two or more products are separated.
2.	Under generally accepted accounting principles, joint costs are treated as period costs as they cannot be exactly identified with the units of the different outputs.
3.	Under the net realizable value method, joint costs are allocated based on the final selling prices of the joint products.
4.	When using the net realizable value method, if there are no further processing costs, then the gross margin as a percent of sales will be equal for all joint products with common joint costs.
5.	When using the net realizable value, method, if the further processing costs are equal percentages of the final sales values for all the joint products, then the gross margin as a percent of sales will be equal for all the joint products with common joint costs.
6.	highest number of units is allocated the highest peso value of the joint
7.	All other things being equal, raising the number of units of one joint product will reduce the joint cost allocation to all the remaining joint products when using the physical quantities method
8	In a sell-or-process-further decision, it is sufficient to compare total revenue without the additional processing to total revenue without the additional processing to total revenue without the additional processing to total revenue with further processing.
9	If all by-products produces during a period are sold during the period then net income for the period is unaffected by the choice of deducting the net realizable value of the by-products from the cost of the main

product or showing the proceeds from the sales of the by-products as

other income



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S. In a self-or-process-hatter decision, it is sufficient to compare total

is all by-previous trustance during a partial new well dealers the thefast then net meetic the rine partod is anothermed to the carbon of declaring nines, salt to man afte their amotherapyed out to active evaluation ran salt product or showing the proceeds from the value of the by-products as

#### **PROBLEMS**

#### Problem 1

Owen Company produces four joint products, which have a manufacturing cost of P 434,000 at the split-off point. Data pertaining to these products are as follows:

Sinted temborg itses to recouls out that

Product 11 11 11 11 11	Market value		Weight
A	at split-off	Units produced	factor
Dieda di	P 4.00	20,000	3.0
*B ( 9 %) . W . M . M . M	1.75	32,000	5.5
C	3.00	36,000	5.0
D	2.75	24,000	6.0

Required: Allocate the joint cost using

- 1. Market value method
- 2. Average unit cost method
- 3. Weighted average method

# Problem 2

The Meadows Company produced three joint products at a joint cost of P 264,000. Additional information for a recent period is as follows:

Units Sales Value			Sales value an <u>Processing if</u>	
<b>Product</b>	<u>Produced</u>	at split-off	Sales Value	Add'l costs
A	13,200	P 88,000	P 121,000	P 19,800
В	8,800	77,000	99,000	15,400
C	4,400	55,000	66,000	11,000

Required: Allocate joint costs using:

- 1 Sales value at split-off
- 2. Physical units

#### Problem 3

Anchor Company manufactures three main products, A, B, and C, from a joint process. Joint costs are allocated on the basis of market value at split-off. Additional information for June production follows:

200 000	<u>A</u>	<u>B</u>	<u>C</u>	Total
Units produced	50,000	40,000	10,000	100,000
Joint costs				P450,000
Sales value at SO	P420,000	P270,000	P 60,000	750,000
Add'l costs if processed	88,000	30,000	12,000	130,000
Sales value if processed	538,000	320,000	78,000	936,000

Required: Compute for the total costs of each product using:

- 1. Market value method
- 2. Average unit cost method

#### Problem 4

The Laguna Chemical Company produces a product known as "Choco" from which by-product results. This by-product can be sold at P1.00 a pound. The manufacturing costs of the main product and by-product up to the point of separation for the three month period ending March 31, 2019 follows:

Materials	P 30,000
Labor	17,400
Overhead	17,400

The units processed were 20,000 pounds of the main product and 2,000 pounds of the by-product. During the period 18,000 pounds of the main product were sold at P10.00 a pound and 1,000 pounds of the by-product. Selling and administrative expenses applicable to the main product is 30% of sales.

Required:

- 1. Income statements assuming that the sales of the by-product is treated as income, using the different methods.
- 2. Income statement assuming that the sales of the by-product is treated as reduction of the production cost of the main product.

#### Problem 5

Fisher Company manufactures one main product and two by-products, A and B. For April, the following data are available.

		BY-P	RODUCT
Sales	<u>Main Prod</u> P 75,00		<u>B</u> P 3,500
Manufacturing cost after separation Marketing & adm. exp. Manufacturing cost before	11,50	0 1,100	900
separation	anal/ass	one med	37,500

Profit allowed for A and B is 15% and 12% respectively.

#### Required:

- 1. Calculate the manufacturing cost before separation for by-products A and B using the market value (reversal cost) method.
- 2. Prepare income statement (showing details for sales and costs for each product).

#### Problem 6

Eternity Company manufactures joint products X and Y as well as by-product Z. Cumulative joint cost data for the period show P204,000, representing 20,000 completed units processed through the Refining Department at an average unit cost of P10.00. Costs are assigned to X and Y by the market value method, which considers further processing costs in subsequent operations. To determine the cost allocation to Z, the market value (reversal cost) method is used. Additional data:

		<u>Z</u>	<u>X</u>	Y
Quantity processed		2,000	8,000	10,000
Sales price per unit	- March	P 6.00	P 20.00	P 25.00
Further processing cost per unit	The live	2.00	5.00	7.00
Marketing and administrative				
expense per unit		1.00		<u>-</u>
Operating profit per unit		1.00	and the second	
Required:	print 11 S F			

- 1. Compute the joint cost allocated to Z.
- 2. Allocate the remaining joint cost to X and Y.

#### Problem 7

The North Avenue Products Company manufactures two products, "East" and "West", incident to the production of which a by-product, "South" results. Material is started in Process 1 at the end of which three products emerge. "East" is further processed in Process 2 while "West" and "South are sold without additional processing.

For the month of September, 2019, the following data are available:

Materials entered in	Process1	grandig Ki	$\mathbf{P}$	6,250.00
Processing costs:	Process 1			4,000.00
	Process 2			3,000.00

There are no beginning or ending inventories of work in process. Production and sales data are as follows:

	the state of the s	-1-	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	Sales price
<b>Product</b>	Oty. Produced	Oty. solo		P 7.00
East	3,000	2,500		5.00
West	2,000	1,700		0.40
South	500	500		

Selling and administrative expenses constitute 20% of sales for "East" and "West" and 10% of sales for "South"

Joint costs are allocated to joint products on relative sales values except that the sales value of "East" should be reduced by its unit cost in Process 2 for the purpose. The by-product is not charged with any share of joint cost. By-product revenue is deducted from joint costs.

#### Required:

- 1. Income statement for "East" and "West."
- 2. Schedule allocating the joint cost to "East" and "West."

#### Problem 8

A company manufactures three products in a joint production process. The three products X, Y, and Z. No by-product is produced in the process. Additional information follows

a specification of		<u>Product</u>			
	X	Y	Z .	T	OTAL
Units produced	10,000	6,000	4,000	9899	10,000
	P 99,000	<b>a</b> , <b>a</b> ,	b	P	180,000
Sales value at split-off	C		P 50,000	P	250,000
Add'l cost to process further	16,000	P 12,000	6.000	P	40,000
Sales value if processed further	160,000	P 80,000	60,000	P	300.000

The company allocates joint cost using the net realizable value method

Required: Fill in the missing information as indicated by the letters.

#### Problem 9

The Cherry Blossoms Company uses a process cost system to account for the production of three different products: A, B, C. The products are considered joint products in the first department (Dept. 1). The products are separated at the end of processing in Department 1. Product A needs no further processing after the split-off point while product B and C are sent to Department 2 and Department 3, respectively, for further processing. The following revenue and cost information is available:

Due de et	Units	Market Value	Additio	onal Process	ing
	Produced	at Split-off (per unit)	K to the tri	cost	
A	80,000	P 20.00		amenda one	
В	70,000	30.00	P	560,000	
C	90,000	25.00		540,000	

Cost incurred in Department 1 amounted to P 2,880,000

Required: Allocate the cost of Department 1 using the net realizable value method.

#### Problem 10

Comely Products manufactures three products, R ,S and T, in a joint process. For every ten kilos of raw materials input, the output is five kilos of R, three kilos of S, and two kilos of T. During August, 50,000 kilos of raw materials costing P120,000 were processed and completed, with joint conversion costs of P200,000. Conversion costs are to be allocated to the products on the basis of market values. To make the products saleable, further processing which does not required additional raw materials was done at the following costs:

	Further Processing Cost	Selling Price
Product R	P30,000	P10.00
Product S	20,000	12.00
Product T	30,000	15.00

#### Requirements:

- 1. The unit cost of Product R is:
- 2. Assuming that all units are sold, the gross margin on sales for Product R is:
- 3. Assuming that all units are sold, the gross margin on sales for Product S is
- 4. If all units of Product T are sold, and selling and administrative expenses are 20% of sale, the net income from the sale of Product T is:

Problem 11
Below are production and sales data for three products. Joint costs amounted to P35 000

Product	Qty. produced	Selling price	Cost after splii P3.000	1,200
M	1,500 2,500	P10.00 12.00	2,000	2,000
0 > 110	1,000	15.00	5,000	800

#### Requirements:

- 1. Compute the cost of goods sold of M
- 2. Compute the gross profit of N
- 3. Compute the value of ending inventory of O

#### Problem 12

Ferguson Company purchases cocoa beans and processes them into cocoa 'butter, cocoa powder and cocoa shells. The standard yield from each 100 pound sack of unprocessed cocoa beans is 20 pounds of butter, 45 pounds of powder, and 35 pounds of shells. The butter must be molded and packed before it can be sold. The further processing costs is P1.50 per pound, but the resulting processed butter can be sold for P12.50 per pounds. The powder can be sold for P9.00 per pound at the split-off point. The shells, which are considered a by-product, sell for P0.40 per pound. The company estimates net realizable value at the split-off point if no market price is available at that point. The costs of the cocoa beans is P1,500 per hundred pounds. It costs P3,700 in labor and overhead to process each 100 pounds of beans up to the split-off point.

#### Requirements

- 1. Assuming that the shells are recorded as other income at the time they are sold, compute the allocated joint costs of the butter and powder produced from 100 pounds of cocoa beans, using the net realizable value method.
- 2. Assuming that the shells are recorded as other income at the time they are sold, compute the allocated joint cost of the butter and powder produced from each 100 pounds of cocoa beans, using the physical quantities (pounds) method.
- 3. If the net realizable value of the shells is entered as a credit to the primary manufacturing costs at the time the shells are recovered and if the net realizable value method is used for joint cost allocation, what would be the allocation of the joint cost to the main products.

# MULTIPLE CHOICE - THEORIES

- 1. When two products are produced during a common process, what is the factor that determines whether the products are joint products or one principal product and a by-product?
  - a. Potential marketability for each product.
  - b. Amount of work expended in the production of each product.
  - c. Relative total sales value.
  - d. Management policy.
- 2. A by-product is best described as
  - a. A product that is produced from materials that would otherwise be considered scrap.
  - b. A product that has a lower selling price than the main product.
  - c. A product manufactured along with the main product, a sales value that does not cover its cost of production.
  - d. A product that usually yields a small amount of revenue when compared to the revenue from the main product.
- 3. Which of the following components of production re allocable as joint costs when a single manufacturing process produce several salable products?
  - a. Materials, labor, overhead.
  - b. Materials and labor only.
  - c. Labor and overhead only.
  - d. Overhead and materials only.
- 4. Relative sales value at split-off is used to
  - a. Allocate separable costs.
  - b. Determine relevant costs.
  - c. Determine the break-even point in sales pesos.
  - d. Allocate joint costs.
- 5. For purposes of allocating joint costs to joint products, the relative sales value at split-off is equal to
  - a. Sales price at point of sale reduced by cost to complete after split-off.
  - b. Total sales value less joint costs at point of split-off.
  - c. Separable product cost plus a normal profit margin.
  - d. Sales price at ultimate point plus cost to complete after split-off

6. At the split-off point, products may be salable or may require further processing in order to be salable. Which of the following have both of these characteristics?

7 (40)	BY-PRODUCTS	JOINT PRODUCTS
a.	No	No
b.	No	Yes
c.	Yes	No
d.	Yes	Yes

- 7. One of the accepted methods of accounting for by-product is to recognize the value of the by-product as it is produced. Under this method, inventory costs for the by-product would be based on
  - a. An allocation of some portion of joint costs but not any subsequent costs.
  - b. Neither an allocation of some portion of joint costs nor any subsequent processing costs.
  - c. Subsequent processing costs less an allocation of some portion of joint costs.
  - d. An allocation of some portion of joint costs plus any subsequent costs.
- 8. An inventory valuation procedure which is particularly adaptable in accounting for by-products is
  - a First-in, first-out
  - b. Last-in, first-out
  - c. Market price of the products, less cost of disposition
  - d. Common costs.
- 9. In accounting for by-products, the value of the by-product may be recognized at the time of

	<u>PRODUCTION</u>		SALE
a.	Yes		Yes
b.	Yes		No
c.	No	Livea	No
d.	No		Yes

10. By-products could have which of the following characteristics?

$\mathbf{Z}$	ERO COSTS BEYOND SPLIT-OFF	ADD'L COST BEYOND SPLIT-OFF
a.	No manda in the same and a	No.
b.	No	Yes
c.	Yes	이 마음이 되어 가는 이번 이 가지 않아 하겠다는 것이다면 가장 하는 것이다. 그리고 있다는 것이다.
А	Yes	with the same and Yes
•	The same of the second of the second	sully lated ma NO was a series of h

- 11. In the reversal cost method, manufacturing costs applicable to the by-product ending inventories should be reported in the
  - Income statement
  - Balance sheet b.
  - Both a and b
  - None of the above
- Which method of accounting for by-products allocates a portion of joint costs to the by-product?
  - Net realizable method
  - Reversal cost method b.
  - Both a and b C.
  - None of the above d.
- 13. Joint costs are
  - a. Indivisible
  - Present throughout the production process of joint products b.
  - Common costs
  - Composed of direct materials, direct labor, and factory overhead d.
- 14. If two or more products share a common process before the are separated, the joint costs should be allocated in a manner that
  - Assigns a proportionate amount of the total cost to each product by means of a quantitative basis
  - Maximizes total earnings b.
  - Maximizes variations in a unit of production cost
- 15. The joint cost allocation method that will assign the same gross profit rate for all products
  - Average unit cost method a.
  - Relative sales value method b.
  - Weighted average method c.
  - Reversal cost method

# MULTIPLE CHOICE - PROBLEMS

Lee Co. produces two joint products, Bex and Rom. Joint production costs for June, 2019 were P 30,000. During June, 2019, further processing costs beyond the split-off point needed to convert the products into salable form, were P 25,000 and P 35,000 for 1,600 units of Bex and 800 units of Rom, respectively. Bex sells for P 50 per unit, and Rom sells for P 100 per unit. Lee uses the net realizable value method for allocating joint product costs.

- 1. For June, 2019, the joint costs allocated to product Bex were
  - a. P 20,000
  - b. P 16,500
  - c. P 13,500
  - d. P 10,000

Life Co. manufactures products X and Y from a joint process that also yields a by-product, Z. Revenue from sales of Z is treated as a reduction of joint costs. Additional information is as follows:

	PRODUCTS					
+ 1 mv2-125	X	Y	<u>Z</u>	TOTAL		
Units produced	20,000	20,000	10,000	50,000		
Joint costs	Same Same	?	?	P 262,000		
Sales value at split-off	P300,000	P150,000	P 10,000	P 460,000		

Joint costs were allocated using the sales value at split-off method.

- 2. The joint costs allocated to product X were:
  - a. P 75,000
  - b. P 100,000
  - c. P 150,000
  - d. P 168,000

Lane Co. produces main products K and W. The process also yields by-product Z. Net realizable value of by-product Z is subtracted from joint production cost of K and W. The following information pertains to production in July, 2019 at a joint cost of P 54,000.

PROPUGE	UNITS .	IF PROCES	SED FURTHER
PRODUCT	PRODUCED	MARKET VALUE	COST AFTER SPLIT-OFF
W	1,000 1,500	P 40,000 35,000	P 0
Z	500	7,000	0 3,000

X. Y. and a

Y and Z oni.

9. How much of the joint cost shoul

Michelle Company produ-

- 3. If Lane uses the net realizable value method of allocating joint costs, how much of the joint cost should be allocated to product K.
  - P 18,800
  - P 20,000 b.
  - c. P 26,667
  - P 27,432

Abel Corp. manufactures a product that yields the by-product "Yum." The only costs associated with Yum are selling costs of P.10 for each unit sold. Abel accounts for sales of Yum by deducting Yum's separable costs from Yum's sales, and then deducting this net amount from the major product's cost of goods sold. Yum's sales were 100,000 units at P1.00 each.

- 4. If Abel changes its method of accounting for Yum's sales by showing the net amount as additional sales revenue, then Abel's gross margin would
  - Increase by P 90,000
  - Increase by P 100,000 b.
  - Increase by P 110,000
  - Be unaffected d.
- If Abel changes its method of accounting for Yom's sales by showing the net 5. amount as other income, then Abel's gross margin would
  - Decrease by P 90,000 a.
  - Increase by P 100,000 b.
  - Be unaffected Increase by P 110,000 d.

O'Donnell Company manufactures Product J and Product K from a joint process. For Product J, 4,000 units were produced having a sales value at split-off of P15,000. If Product J were processed further, the additional costs would be P3,000 and the sales value would be P20,000. For Product K, 2,000 units were produced having a sales value at split-off of P10,000. If Product K were processed further, the additional costs would be P1,000 and the sales value would be P12,000. GEOUGOMY

- 6. Using the sales value at split-off method, the portion of the total joint costs allocated to Product J was P 9,000. What were the total joint costs?
  - P 14,400 a.
  - P 15,000 b.
  - P 18,400. c.
  - P 19,000 d.

From a particular joint process, Watkins Company produces three products, X, Y, and Z. Each product may be sold at split-off or processed further. Additional processing requires no special facilities, and production costs of further processing are entirely variable and traceable to the products involved. In 2016, all three products were processed beyond split-off. Joint production costs for the year was P60,000. Sales value and costs for 2019 are as follows:

Units produced Sales values at split-off	6,000 P25,000	4,00 P41,00	201000
If processed further Final sales value Separable costs	42,000 9,000	45,00 7,00	0.000

Joint costs are allocated to the products in proportion to the relative physical volume of output.

- 7. The relevant unit cost for a decision to sell Product Z or process further is
  - a. P 5.00
  - b. P 12.00
  - c. P 4.00
  - d P 9.00
- 8. See item 7. To maximize operating income, Watkins should subject the following products to additional processing:
  - a. X only
  - b. X, Y, and Z
  - c. Y and Z only
  - d. Z only

Michelle Company produces joint Products A and B from a process that also yields a by-product Y. The by-product require additional processing before it can be sold. The cost assigned to the by-product is its market value minus additional costs incurred after split-off. Information concerning a batch produced in January, 2016 at a joint cost of P40,000 is as follows:

PRODUCT	UNITS PRODUCED	MARKET VALUE	COSTS AFTER SPLIT-OFF
ages At a large	800	P 44,000	P.4,500
В	700	32,000	3,500
<b>C</b>	- 500	4,000	1,000

- 9. How much of the joint cost should be allocated to the joint products?
  - a. P 35,000
  - b. P 36,000
  - c P 37,000
  - d. P 39,000

Justine Michelle Company manufactures three products. The total joint cost associated with these products is P52,500. Product number one is not marketable at split-off. However, additional processing costing P15,000 will yield a product salable at P30 per unit. Product number two can be sold for P15 per unit at split-off, but management prefers to utilize available space in performing an additional process at a cost of P 18,000 which increases the price of the final product to P40. Product number three is usually sold at split-off at P50 per unit. For the year, 2,900 output units were produced. Product number one's production exceeded product number two's by three hundred, while product number three's production exceeded product number one's by two hundred.

- 10. The joint cost allocated to product number one is:
  - a. P 6,522
  - b. P 9,211
  - c. P 16,580
  - d. P 18,103

Fortune Products manufactures three joint products, JKA, JKB, and JKC and a by-product JJD, all in a single process. Results for the month of July were as follows:

Materials used	THE CHARLES THE SERVICE		10,000 kgs	P 24,000
Conversion cost			, ,	28,000
No. of Kilos	Product		Sales Value/Kilo	
4,000	JKA		P 11.00	
3,000	JKB		10.00	
1,000	JKC		26.00	
2,000	JJD	,	1.00	

Revenue from by-product is credited to the sales account. Process costs are apportioned on a relative sales value approach.

- 11. What was the cost per kilogram of JKA for the month?
  - a. P 5.72
  - b. P 5.50
  - c. P 5.61
  - d. P 5.20

The Wood Company produces 3 joint products at a joint cost of P100,000. Two of these products were processed further. Production and sales were

Product	Weight	Sales	Addt'l Processing Cost
A	300,000 lbs.	P245,000	P200,000
В	100,000 lbs.	30,000	None None
C	100,000 lbs.	175,000	0.00.000 (0.000,000)

- 12. If the net realizable value method is used, how much of the joint costs would be allocated to product C? Assume that B is accounted for as a joint product.
  - a. P38,889
  - b. P50,000
  - c. P41,667
  - d. P62,500
- 13. Assume B is a by-product whose sales value is credited to the joint production costs. If net realizable value is used, how much of the joint costs would be allocated to product C?
  - a. P45,000
  - b. P50,000
  - c. P43,750
  - d. P62,500
- 14. If joint costs are allocated based on relative weight of the outputs how much of the joint costs would be allocated to product A? (all products are joint products)
  - a. P43,750.
  - b. P60,000
  - c. P50,000
  - d. P62,500

Justine Michelle Company makes two products, A and B. They are initially processed from the same materials and then, after split-off, further processed separately. Additional information is as follows:

	Α	В	Total
Final sales value	P9,000	P6,000	P15,000
Joint cost prior to split-off	?	?	6,600
Cost beyond split-off	3,000	3,000	6,000

- 15. Using the net realizable value approach, compute the assigned joint cost of A and B respectively
  - a. P3,300 and P3,300
  - b. P3,960 and P2,640
  - c. P4,400 and P2,200
  - d. P4,560 and P2,040

Lego Plastics, Inc. has two joint products, ABBA and ADDA, and uses the net realizable value method of allocating joint costs. The total joint costs for the year 2016 amounted to P300,000. During the year, additional processing costs after split-off were P160,000 for ABBA and P240,000 for ADDA. Lego produced 16,000 units of ABBA and 8,000 units of ADDA during the year. The selling price for ABBA is P20.00 and for ADDA is P50.00.

- 16. The portion of joint costs allocated to ADDA during the year is
  - a. P175,000
  - b. P225,000
  - c. P180,000
  - d. P150,000

Janice Corporation processes direct materials up to the split-off point, where products R and S are produced and thereafter sold. For the month just ended, the following information were made available

Direct materials processed-	20,000 gallons (yield- 19,000 gallons of good
Production	product and 1,000 gallons of shrinkage)
R S	10,000 gallons 9,000 gallons
Unit selling price	5,000 ganons
R	P1,500 per gallon
Lessons that a said built has be	P1,000 per gallon

The cost of buying 20,000 gallons of direct materials and processing up to split off point to yield a total of 19,000 gallons of good products was P19,500,000. The beginning inventories totaled 100 gallons for R and 50 gallons for S. Ending inventories amounts reflected 600 gallons for R and 1,050 gallons for S.

- Using the volume of production as the basis for allocating joint costs, the 17. assigned costs to R and S would be
  - and S, P9,750,000 a. R, P 9,750,000
  - b. R, P10,550,000 and S, P8,950,000
  - c. R, P10,028,571.43 and S, P9,471,426.57
  - d. R, P10,263,157.89 and S, P9,236,842.11

Chem Manufacturing Co. processes direct materials up to the split-off point, where two products (X and Y) are obtained and sold. The following information was collected for the month of February. Direct materials processed: 10,000 gallons (yield is 9,500 gallons of good product

and 500 gallons of shrinkage)

Production:

5,000 gallons

4,500 gallons

Sales:

X

4,750 at P 150 per gallon

4,000 at P 100 per gallon Y

The cost of purchasing 10,000 gallons of direct materials and processing it up to the split-off point was P 975,000. The beginning inventories totaled 50 gallons of X and 25 gallons of Y. Ending inventory amounts reflected 300 gallons of product X and 525 gallons of product Y. January costs per unit were the same as February.

18. Using physical volume method in allocating joint costs compute for (1) product X approximate production cost per unit and (2) approximate amount of joint costs in product Y's ending inventory.

(1) P 102.33

(2) P 50,917

(1) P 102.63 b.

(2) P 53,886

(1) P 114.80

(2) P 60,145

(1) P 120.00

(2) P 60,285

Donna Corporation manufactures products (Bud, Cud, and Dud) from a joint process. The total costs for January is P250,000. Other information for January show:

	Bud	Cud	Dud
Quantity	3,000	4,000	3,000
Processing cost after SO	P50,000	P75,000	P125,000
Ultimate sales value	150,000	275,000	225,000

19. What is the total production cost for (1) Bud, (2) Cud, and (3) Dud using the market value method?

a. (1) P100,000

(2) P150,000

(3) P250,000

b. (1) P125,000

(2) P175,000

(3) P200,000

c. (1) P137,500

(2) P200,000

(3) P225,000

d. (1) P112,500

(2) P200,000

(3) P187,500

Producers Inc. purchases its major raw materials from Consolidators Co. and processes them up to split-off point, where two products (AA and CC) are obtained. The products are then sold to an independent company that markets and distributes them to retail outlets. For the month just ended the data on the next page were made available:

Raw material Production	s purchased		0007 6	25,000 units
	AA	Though.	0,1399	15,000 units
	CC	ill gellag	in the said	15,000 units
Sales				
	AA		J 107 39	14,500 units @ P2
	CC	k in the second	54457	15,000 units @ P5

The cost of purchasing 25,000 units of raw materials and processing them up to the split-off point to yield equal number of production of AA and CC of 15,000 units each amounted to P37,500. There were no beginning inventories but there were 500 units of AA at the end of the month.

- 20. Using the sales value at split-off method, the approximate weighted cost proportions (may be rounded) of AA and CC were
  - a. AA, 29% and CC, 71%
  - b. AA, 33% and CC, 67%
  - c. AA, 49% and CC, 51%
  - d. AA, 50% and CC, 50%

Joie Company manufactures two joint products R and S. Joie produced 12,000 units of R with an after split-off sales value of P45,000. However, if R were to be processed further, additional cost of P6,000 will be incurred but the sales value will increase to P60,000. Joie produced 6,000 units of S with an after split-off sales value of P30,000. However, if S were to be further processed, additional cost of P3,600 will be incurred but the sales value will go up to P36,000. Under the relative sale value at split-off approach, the allocation to R from the total product cost is P27,000.

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- 21. What is the total joint product cost?
  - a. P75,000
  - b. P27,000
  - c. P45,000
  - d. P67,500

Worth Inc. manufactures products A, B and C from a joint process. Additional information is as follows:

15 45 10110113.	74 M 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	OA ) B	C	Total
Units produced	$\frac{A}{4,000}$	2,000	1,000	7,000
Joint cost	P36,000	C. Land	?	P 60,000
Sales value at SO	7	?	P15,000	P100,000
Cost after SO	P 7,000	P 5,000	P 3,000	?
SV at final point	P70,000	P30,000	P20,000	vid.mes

- 22. Assuming that joint products are allocated using the net realizable value at split-off approach, what joint costs were allocated to product B and C?
  - a. P12,000 for B and P12,000 for C
  - b. P14,400 for B and P 9,600 for C
  - c. P15,000 for B and P 9,000 for C
  - d. P16,000 for B and P 8,000 for C

Petal manufactures three products, (petals, twigs, and stems) from a joint process. The total costs for January is P250,000. Other information for January show:

·	Petals	Twigs	Stems
Quantity	3,000	4,000	3,000
Processing cost after split-off	P50,000	P75,000	P125,000
Ultimate market value	150,000	275,000	225,000

- 23. What are the total production costs for (1) Petals, (2) Twigs, (3) Stems using the average cost method?
  - a. (1) P137,500 (2) P200,000 (3) P225,000
  - b. (1) P100,000 (2) P150,000 (3) P250,000
  - c. (1) P125,000 (2) P175,000 (3) P200,000
  - d. (1) P112,500 (2) P200,000 (3) P187,500

The Universal Manufacturing Company produces three products by a joint production process. Direct material is put into production in Department A and at the end of processing in the department three products appear. Product X is sold at the split-off point with no further processing. Product Y and Z require further processing before they are sold. Product Y is processed in Department B and Product Z is processed in Department C. The company uses the estimated net realizable value method of allocating point production costs. A summary of costs and other data for the year

secures and Business sached criss of parable	enidos nei a	Products	drawn met all
Units sold Units on hand Sales	X 10,000 20,000 P 15,000	Y 30,000 0 P 81,000	Z 40,000 20,000 P141,750
s in spanners discreper division from Historical and		Departments	1 1
	A	B	C
Direct material cost	P 56,000	$\mathbf{P} = 0$	P 0
Direct labor cost	24.000	40,450	101,000
Factory overhead	10,000	10,550	36,625

ork in process inventory on hand on December 31, 2019

- 24. The estimated net realizable and the allocated joint costs of product Y are
  - P 45,000 and P 18,000 respectively
  - P 30,000 and P 18,000 respectively
  - P 45,000 and P27,000 respectively
  - P 30,000 and P 27,000 respectively' d.

Paper Pulp Company purchases trees form Manila seedling and processes them up to the split-off point, where two products (paper and pencil casings) are obtained. The products are then sold to an independent company that markets and distributes them to retail outlets. The following information was obtained for the month of August.

Trees processed:

50 trees (yield is 30,000 sheets of paper and 30,000

pencil casings and no scrap)

Production

Paper

30,000 sheets

Pencil casings

Sales

30,000

Paper

29,000 at P 0.40 per page

Pencil casings

30,000 at P 1.00 per casing

Cost of purchasing 50 trees and processing them up to the split-off point is P 15,000. Paper Pulp Company's accounting department reported no beginning inventories. however, ending inventory amounts reflected 1,000 sheets of paper in stock.

- 25. What are the paper's and pencil's approximate weighted average cost proportions using the sales value at split-off method, respectively?
  - a. 28.57% and 71.43%
  - b. 33.33% and 66.67%
  - c. 49:00% and 51.00%
  - d. 50.00% and 50.00%

- 26. What are the approximate joint costs assigned to the paper ending inventory if joint costs are allocated using the sales value at split-off method?
  - a. P 142.50
  - b. P 500.00
  - c. P 4,350.00
  - d. P 7,500
- 27. What is the approximate production cost per unit for each pencil casing if the sales value at split-off method is used?
  - a. P 0.250
  - b. P 0.255
  - c. P 0.335
  - d. P 0.357

Northern Company processes direct materials up to the split-off point where two products (A and B) are obtained and sold. The following information was gathered for the month of July.

Products	Units Produced	Sciling Price per Unit	Units Sold
A	5,000	P 150.00	4,750
B	4,500	100.00	4,000

The cost of purchasing the direct materials and processing it up to the split-off point to yield a total of 9,500 units was P 975,000. The beginning inventories totaled 50 units for A and 25 units for B. Ending inventory amounts reflected 300 units of A and 525 units of B. July's costs per unit were the same as June.

- What is products' A approximate gross margin percentage using the physical 28. value method.
  - a. 32%
  - b. 33%
  - c. 35%
    - d. 38%

## STANDARD COSTING

## LEARNING OBJECTIVES

Upon completion of this chapter, you should be able to

- Define standards and discuss how they are developed.
- Explain the difference between actual, normal, and standard costing.
- Understand the uses of standard costing.
- Explain the establishment of direct materials standards, direct labor standards and factory overhead standards
- Compute the direct materials price variance and the direct materials usage variance
- Compute the direct labor rate variance and the labor efficiency variance
- Compute factory overhead variance using the one, two, three and four way variances

In an actual cost system, product costs are only recorded whey they are incurred. This technique is usually acceptable for the recording of direct materials, and direct labor because they can be easily traced to specific jobs (job order costing) or departments (process costing). Factory overhead, the indirect cost components of a product, usually cannot be easily traced to a specific job or department. Since overhead is not a direct cost of production, a modification of an actual cost system, called normal costing, is commonly used. Under normal costing, direct materials and direct labor costs are accumulated as they are incurred with one exception factory overhead is applied to production, on the basis of actual input (hours, units, costs, etc. multiplied by a predetermined factory overhead application rate. Under standard costing, all costs attached to products are based on standard or predetermined accounts. Standard costs represent the "planned" costs of a production and are generally established well before production begins. The establishment of standards thus provide management with goals to attain (i.e – planning) and bases for comparison with actual results (i.e – control).

Standard costs are those expected to be achieved in a particular production process under normal conditions. Standard costing is concerned with cost per unit and serves basically the same purpose as a budget. Budgets, however, quantify management expectations in terms of total costs rather than in terms of per unit costs. Standard costs do not replace actual costs in a costing accumulation system. Instead, standard costs and actual costs are both accumulated.

Standard costs are also known as planned costs predicted costs, scheduled costs, and specification costs. Estimated costs are different from standard costs because estimated costs have historically been used as projections of what per unit costs will be for a period, while standard costs are what a unit cost of a product should be.

The purpose of standard cost accounting is to control costs and promote efficiency. This system is not a third cost accounting method, but is used with either job order or process costing to manufacture a product and the subsequent comparison of the actual costs with the established standard. Any deviation fro the standard can be quickly detected and responsibility pinpointed so that appropriate action can be taken to eliminate inefficiencies or to take advantage of efficiencies.

Fig 13-1 Comparison of Actual, Normal, and Standard Costing

	an country a proceed out to a separate of the country of the count	Actual Costing	Normal Costing	Standard Costing
Cos	st of a product			
	Direct materials	Actual	Actual	Standard
	Direct labor	Actual	Actual	Standard
	Factory overhead	Actual	Applied	Standard

Standard costs are usually determined for a period of one year and are revised annually. However, if cost analyses during the year indicate that a standard is incorrect, or if a significant change has occurred in costs or other related factors management should not hesitate to adjust the standard accordingly.

#### **USES OF STANDARD COSTS**

Cost information may be used for many different purposes. It should be noted that cost information which serves one purpose may not be appropriate for another. Therefore, the purpose for which cost information is to be used should be clearly defined before procedures are developed to accumulate cost data. Standard costs may be used for

- 1. Cost control
- 2, Pricing decisions
- 3. Performance appraisal
- 4. Cost awareness
- 5. Management b objectives

#### COST CONTROL

Cost control refers to identifying a cost with its related benefits and making sure that the cost is justified given the benefits derived. Standard costs provide a very useful tool for cost control. The standard cost of a product is usually computed on a per unit basis. This standard cost is then used to determine the cost of manufacturing any number of units by simply multiplying the total units produced by the standard unit cost. Actual costs can be compared with standard costs as frequently as necessary, whether monthly, weekly, daily or for a single work shift. With time performance, reporting, management can take action quickly to control problems as they arise. Unnecessary high costs could go undetected without standard costs.

#### PRICING DECISIONS

rices are established by business firms to cover the cost of a product and at the same time provide for profit. Accurate cost information is needed not only by profit organizations but also by not-for-organizations to price their products or services fairly and within regulatory guidelines. While actual costs reflect accurately the costs involved in producing goods or services, they do not always provide consistent and timely information for pricing. Standard costs provide a measure of consistency by eliminating fluctuations in actual costs, such as seasonal costs for some raw materials or random fluctuations such as unexpected cost changes in world markets. Since companies now are operating in competitive markets it becomes vital to generate consistent and timely cost information in pricing its products or services. Standard costs provide this timely information.

## PERFORMANCE APPRAISAL

When standards are established for performance appraisal, they provide measurements that can be applied uniformly to all personnel being evaluated. Standards provide one of the few objective means of performance evaluation. For the standards to work well, they must be understood by the people being evaluated. The employee should also know how the standards are used in employee evaluation and reward system.

## **COST AWARENESS**

The primary concern of many managers are usually increasing production, improving product quality, and reducing absenteeism. Although these are important goals each has specific cost consequences which managers may not be aware of. Standard cost performance reports inform managers of the cost implications of these actions and as a result make them take steps to effectively control costs.

MANAGEMENT BY OBJECTIVES (MBO)

Management by objectives means that specific objectives are established for each business activity and the manager responsible for that activity works to achieve the objectives. When an activity falls with the acceptable performance levels, little managerial action is necessary other than routine supervision. When performance varies significantly from acceptable levels, the manager tries to correct the problem by taking appropriate actions. A standard cost system facilitates MBO because it provides a quick reference for identifying and reporting differences between standard and actual performance.

# ESTABLISHMENT OF STANDARDS

An integral part of any standard cost system is the setting of standards for direct materials, direct labor and factory overhead.

## DIRECT MATERIALS STANDARDS

1. Direct materials price standards

Price standards are the unit price at which direct materials should purchased. Even though material costs are stated on a per unit basis, management must still estimate total sales for next period before individual standards can be set. The sales forecast is of utmost importance because it will first determine the total units of finished goods that will have to be produced and then determine the total quantity of direct materials that will have to be purchased during the next period. Most suppliers will offer substantive quantity discounts on the basis of increasing quantities of direct materials expected to be ordered for the entire period. Once the quantity to be purchased has been determined, the net purchase price can be established by the supplier.

The cost accounting department and/or the purchase department are normally responsible for setting the direct material price standards since they have ready access to price data and should have knowledge of market conditions and other relevant factors. The purchasing department is responsible for canvassing suppliers to determine which supplier will give the best price at the desired quality level and within the constraint of delivery and other requirements.

The standard setting process for direct material can be very time consuming especially for large manufacturing companies that must set standards for hundreds of different materials. When more than one direct material is used individual direct material.

# Chapter 13 Standard Costing

2. Direct materials usage (efficiency) standards

Efficiency (quantity or usage) standards are predetermined specifications of the quantity of direct materials that should go into the production of one finished unit. If more than one direct material is required to complete a unit individual standards must be computed for each direct material. The number of different direct materials and the related quantities of each required to complete one unit can be developed from engineering studies, analysis of past experiment using descriptive statistics, and/or test runs under controlled conditions.

The engineering department, because it designs the production process is in the best position to set realistically attainable material standards

### DIRECT LABOR STANDARDS

1. Direct labor price standards.

Price (rate) standards are predetermined rates for a period. The standard rate of pay that an individual will receive is usually based on the type of job being performed and the experience that the person has had on the job. The wage rate of most manufacturing companies is usually set forth in the union contract. If a nonunion shop exists, the wage rate will usually be determined by management in consultation with the human resources (HR) department. Items like vacation pay and sick pay are usually not included in the standard rate of pay because they are normally accounted for as part of factory overhead.

2 Direct labor efficiency standards.

Efficiency standards are predetermined performance standards for the amount of direct labor hours that should go into the production of one finished unit. Time and motion studies are helpful in developing direct labor efficiency standards. In these studies, an analysis is made of the procedures followed by workers and the conditions (space), temperature, equipment, tools, lighting, etc. under which workers must perform their assigned tasks.

Studies have shown that the average time (hours) required to complete one unit will decrease at a constant percentage rate from the first job or unit, until complete processing had taken place. The amount of direct labor hours required to produce one unit will usually decrease as workers become more

familiar with the process. The effect of the learning process on workers may be visually shown in what is technically called the learning curve. The learning curve is based on statistical findings indicating that as the cumulative number of units produced doubles, the average direct labor time required per unit will decrease at a constant percentage (normally ranging from 10% to 40%). These percentages are commonly called cost reduction percentages. Time and motion studies ma be used to determine the percentage to be applied to a specific production process. The period in which the output per hour stabilizes is known as the constant period. After workers have been in the constant stage for long periods of time it is possible that productivity may start to decrease because the challenge and excitement of learning a new production process are over and boredom sets in. Many companies routinely shift workers to different job assignment as a simple and effective means of preventing boredom from developing

In determining standard costs or preparing budgets, unless there is complete automation, failure to take the learning process into consideration may result in erroneous efficiency standards that could have adverse effects on managerial decision making.

Time and motion engineers are usually given the responsibility for setting direct labor efficiency standards. The engineers should have a thorough knowledge of the production process to complement their knowledge of the techniques of time and motion studies. Many large companies have departments staffed by engineers devoted solely to the establishment of direct labor efficiency standards.

#### FACTORY OVERHEAD STANDARDS

The concept of standard setting for factory overhead is similar to standard setting for direct materials and direct labor. However, although the basic concept is similar, the procedures used to compute standard costs for factory overhead are quite different.

One reason for the difference in procedures is the variety of items comprising the factory overhead cost pool. Factory overhead includes indirect materials, indirect labor and all other indirect manufacturing costs such as factory rent, depreciation of factory equipment, etc. The individual costs that make up total factory overhead are effected differently by increases or decreases in

plant activity. Depending on the cost item, plant activity may cause a proportionate change (variable factory overhead costs) a disproportionate change (mixed factory overhead costs), or no change (fixed factory overhead cost) on total factor overhead costs.

When preparing factory overhead cost estimates for the next period, assumption must also be made about changes in costs as a result of inflation, technology advances, and policy decisions regarding production standards or objectives. Budgeting factory overhead costs requires careful analysis of past experience, expected economic conditions, and other pertinent data, in order to arrive at the best possible prediction of next period's factory overhead.

When determining a standard product cost, the amount representing factory overhead cost is separated into variable and fixed costs. Although the total variable factory overhead costs will vary in direct proportion with the production level, the variable factory overhead per unit will remain constant within the relevant range. The total fixed overhead cost will remain constant over different activity levels within the relevant range, while fixed overhead cost per unit will decrease as production increases and increase as production decreases. Because of this cost-behavior characteristic, the application of a standard fixed factory overhead cost to each product becomes a problem when production levels vary.

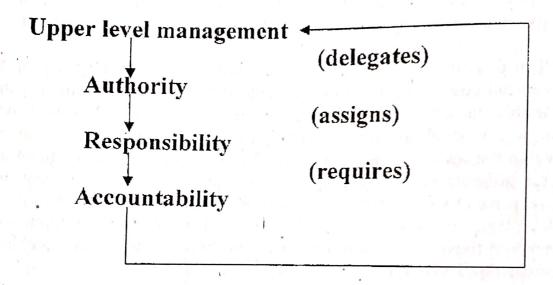
Budgets are commonly used in controlling factory overhead costs. Prior to the period in question a budget that shows anticipated factory overhead costs is prepared. Actual factory overhead costs are later compared with those budgeted as a means of evaluating managerial performance. Budgets may either be static or flexible. Static budgets show anticipated costs at one level of activity only. Flexible budgets show anticipated costs at different activity levels. This preparation of flexible budgets eliminate the problems associated with static budgets in terms of fluctuations in productive activity.

## VARIANCE ANALYSIS

One of the major purpose of using a standard cost system is to aid management in controlling the costs of production Standards enable management to make periodic comparisons of actual results with standard (or planned) results. Differences that arise between actual results and planned results are called variances. Variance analysis is a technique that can be used by management to measure performance,

correct inefficiencies, and deal with the "accountability function". Cost center managers report to the production supervisor who delegated authority to them.

Before accountability can be required of managers, responsibility for costs must be clearly defined. Responsibility for costs should be assigned only to the department or cost center having the authority to incur the cost. When authority is delegated by upper level management to middle or lower level managers, they will be held accountable for their performance. This notion may be diagrammed as follows



## **DIRECT MATERIALS VARIANCES**

Direct materials variances may divided into (1) price variance and (2) efficiency (usage) variance

Direct material price variance – The difference between actual price per unit of direct materials purchased and standard price per unit of direct materials purchased results in the direct materials price variance per unit, and if multiplied by the actual quantity purchased, the result is the total direct material price variance. This is the preferred method of computing the direct material price variance because the variances are recorded when purchases are made. If the problem does not give the quantity purchased, then quantity put into production may be used. Most companies assign the responsibility for prior variances to the purchasing department.

Direct material efficiency (usage) variance —The difference between actual quantity of direct materials and standard quantity allowed multiplied by the standard price per unit equals the direct material efficiency variance. Standard quantity allowed is equal to the standard quantity of direct materials per unit multiplied by equivalent production (fifo method) or units completed during the period. As a result of using the standard price per unit and not the actual price per unit, the effect of price changes has been eliminated. The direct material efficiency variance computed can be solely attributed to differences in the quantity of input unaffected by purchasing department price efficiencies or inefficiencies. The production department or cost center that controls the input of direct materials into the production process is assigned the responsibility for this variance.

## DIRECT LABOR VARIANCES

Direct labor variances may be divided into (1) rate/price variance and (2) efficiency variance.

Direct labor rate (price) variance. The difference between the actual hourly wage rate and the standard hourly wage rate results in the direct labor price variance per hour, when multiplied by the actual direct labor hours worked, the outcome is the total direct labor price variance. The actual number of direct labor hours worked as opposed to the standard direct labor hours allowed is used because we are analyzing the cost difference between the payroll that should have been incurred and the actual payroll that was incurred. Both payrolls are based on the actual number of direct labor hours worked. The supervisor of the department or cost center where the work is performed is held accountable for a direct labor price variance.

Direct labor efficiency variance. The difference between the actual direct labor hours worked and the standard direct labor hours allowed, multiplied by the standard hourly wage rate, equals the direct labor efficiency variance. Standard direct labor hours allowed is equal to the standard number of direct labor hours per unit multiplied by equivalent production (fifo) or units completed during the period. As a result of using the standard wage rate per direct labor hour, the effect of price changes has been eliminated. The direct labor efficiency variance can be solely attributed to worker's efficiencies or inefficiencies. The supervisor of the department or cost center in which the work is performed are accountable for direct labor efficiency variances in that it is their responsibility to oversee production and exercise right control over the number of direct labor hours worked.

## FACTORY OVERHEAD VARIANCES

Factory overhead control under standard costing is similar to the control of direct materials and direct labor. To evaluate performance predetermined standard costs are compared with actual costs incurred. The analysis of factory overhead requires more detail than the variance analysis for direct materials and direct labor. A volume variance must be considered in addition to the price (rate for labor) and efficiency variances that were computed when the direct cost (materials and labor) were analyzed. Different methods have been developed over the years to compute factory overhead variances. Factory overhead variances may be determined using the two-factory analysis, three-factor analysis, and four-factory analysis. Whatever method we use the amount of total factory overhead variance will be the same. The total factory overhead variance is determined by getting the difference between actual factory overhead and standard factory overhead applied to production

## **ONE-FACTOR ANALYSIS**

The difference between actual factory overhead and standard factory overhead applied to production equals the one-factory analysis variance. Standard factory overhead is applied to production by multiplying the standard hours by the standard factory overhead application rate. The one-factor analysis technique is limited in its usefulness because although it shows that a variance exists, it does not help in pinpointing the possible causes. It simply shows the total factory overhead variance.

#### TWO-FACTOR ANALYSIS

Two-factor analysis of factory overhead variances may be divided into (1) controllable (budget) variance and production volume (idle capacity) variance

Controllable (budget) variance. The difference between actual factory overhead and budgeted overhead on the basis of standard direct labor hours allowed equals the controllable (budget) variance. A variance will occur if a company actually spends more or less on factory overhead than expected and/or uses more or less than the number of direct labor hours allowed. This variance is called controllable variance because it is believed that the manager or supervisor has some control over this combined (spending and efficiency) variance.

Production volume (idle capacity) variance. The difference between budgeted overhead on the basis of standard direct labor hours allowed and standard factory overhead applied to production. It may be computed also by capacity) used to determine the fixed factory overhead application rate and

standard direct labor hours allowed then multiply the difference by the standard fixed factory overhead application rate. A production volume variance only relates to fixed factory overhead because, in order to determine a product's cost, fixed factory overhead is applied to production as if it were a variable cost.

## THREE-FACTOR ANALYSIS

Three-factor analysis of factory overhead variance may be divided into (1) price (spending) variance, (2) efficiency variance and (3) production (volume) variance.

Spending variance. The difference between actual factory overhead and budgeted factory overhead on the basis of actual direct labor hours worked equals the price (spending) variance. Take note that the only difference between the computation of controllable (budget) variance and the spending (price) variance is the number of hours used to compute the budgeted factory overhead. Under controllable variance we use standard hours allowed and under spending variance we use actual hours worked. The price variance is also known as the spending variance because in many situations the variance results from price changes (as in direct materials and direct labor price variances) and from temporary changes in operating conditions. A factory overhead spending variance is usually not controllable by management it is results from external forces (example MERALCO increasing its rates); however, it is controllable if the variance is the result of internal factors (example, changes in operating conditions.

Efficiency variance. The difference between actual direct labor hours worked and standard direct labor hours allowed multiplied by the standard variable factory overhead application rate equals the efficiency variance. A variance will occur if workers are more or less efficient than planned. If workers are efficient, actual labor hours worked will be less than standard direct labor hours worked and the variance will be favorable. If workers are inefficient, actual labor hours worked will be more than standard direct labor hours worked and the variance will be unfavorable.

Production (volume) variance. Same as the volume variance computed under the two-factor analysis. This variance is also known as the denominator variance because the variance is the result of production of am activity level different from that used as denominator to calculate the fixed

factory overhead application rate. If production falls below (or rises above) the denominator level used in computing the fixed factory overhead application, fixed factory overhead costs are being under absorbed (or over absorbed). Volume variance is also called the idle capacity variance because it deals with the utilization of the plant and the effect of such utilization of the factory overhead cost of the finished product.

## FOUR FACTOR ANALYSIS

Variable overhead spending variance- The difference between actual variable overhead and budgeted variable overhead on actual hours is the variable overhead spending variance. The variable overhead spending variance is caused by both price and volume differences. Variable overhead spending variances associated with price difference can occur because, over time, changes in variable overhead prices have not been included in the standard rate. Variable overhead spending variance associated with volume differences can be caused by waste or shrinkage of production inputs such s indirect materials.

Variable overhead efficiency variance.—The difference between budgeted variable overhead for actual hours and applied variable overhead is the variable efficiency variance. This variance quantifies the effect of using more or less of the activity which is used as the base for the applied variable overhead

**Fixed overhead spending variance.** The difference between actual fixed factory overhead and the budgeted fixed overhead is the fixed overhead spending variance. This amount normally represents the differences between budgeted and actual costs for the numerous fixed factory overhead components.

Volume variance. This is just the same as the volume variance computed under the two-factor and three-factor analysis.

#### TYPES OF VARIANCES

A variance exists when standard costs differ from actual costs.

#### A. MATERIALS

- 1. Material Price Variance
- 2. Material Quantity Variance

#### B. LABOR

- 1. Labor Rate Variance
- 2. Labor Efficiency Variance

## C. FACTORY OVERHEAD

- 1. Two-Variance method
  - a. Controllable Variance
  - b. Volume Variance
- 2. Three-variance method
  - a. Spending Variance
  - b. Idle Capacity Variance
  - c. Efficiency Variance
- 3. Four-variance method
  - a. Spending Variance
  - b. Variance Efficiency Variance
  - C. Fixed Efficiency Variance
  - d. Idle Capacity Variance

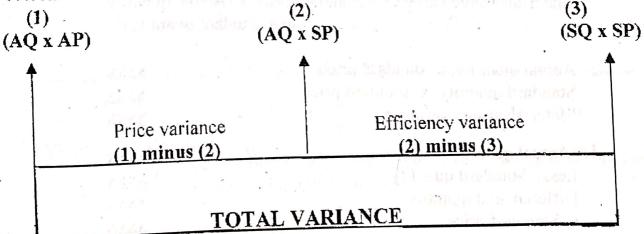
#### **COMPUTING VARIANCES**

#### I. MATERIAL VARIANCES

A price variance and a usage variance are isolated for materials because a purchasing agent may be responsible for the price variance and a production manager for the usage variance.

## A. Material Price Variance

The difference between actual price per unit of direct materials purchased and standard price per unit of direct materials purchased results in the direct materils price variance per unit when multiplied by the actual quantit urchased, the outcomes is the total direct material price variance.



A <u>Material Price Variance</u>
The materials price variance is caused by paying a higher or lower price than the standard price for materials.

#### **Formulas**

1. Material price variance = Actual quantity x (actual price less standard price)

2	Actual quantity x Actual price Actual quantity x Standard price Materials price variance	min , jour	XXXX	
3	Actual price	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	XXXX	
J.	Less: Standard price	2	XXXX	
	Dess. Standard price	783300-01	XXXX	

Difference in price xxxx x Actual quantity xxxx

The material price variance may be computed at the time of purchase or at the time of use of the materials. If purchase price variance is desired, the quantity must be actual quantity purchased and if price variance at time of use is desired, then the quantity must be actual quantity used.

## B. Materials Usage Variance

The materials usage variance is caused by using more or less than the standard amount of materials to produce a product.

#### **Formulas**

1. Materials usage variance = Standard price x (Actual quantity less standard quantity)

2. Actual quantity x standard price	XXXX
Standard quantity x standard price	XXXX
Materials usage variance	XXXX
3. Actual quantity	XXXX
Less: Standard quantity	XXXX
Difference in quantity	XXXX
x Standard price	XXXX
Materials usage variance	XXXX

AQ = Actual quantity
AP = Actual price
SQ = Standard quantity
SP = Standard price

# The possible causes of material price variance are as follows:

1. Fluctuations in market prices of materials

2. Purchasing from distant suppliers resulting in additional transportation costs

3. Failure to avail of cash discounts.

4. Purchasing materials of inferior quality

# The possible causes of material quantity variance

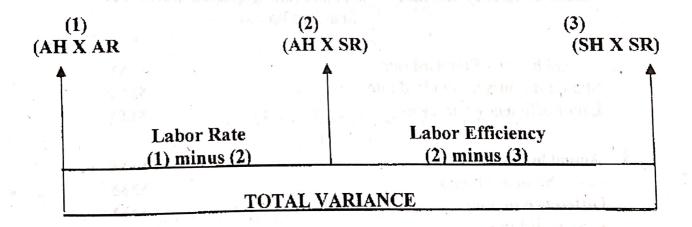
- 1. Loss of materials due to poor handling
- 2. Use of defective or substandard materials

3. Lack of proper tools or machines

4. Spoilage or waste due to use of inferior quality materials

## 11. LABOR VARIANCES

Labor rate and labor efficiency variances relate to the same period because, unlike materials, labor services cannot be purchased in one period, stored, and then used in the next per



## A. Labor Rate Variances

The labor rate variance is caused by paying a higher or lower rate of pay than standard to produce a product or complete a process.

#### **Formulas**

			1 and rate)
1	Labor rate variance =	A 1 kming (Actual 1	rate less rate
	Labor rate variance =	Actual nome (Actual)	

2.	Actual hours x Actual rate Actual hours x Standard rate Labor rate variance	XXXX
	Labor rate variance	
3	Actual rate	XXXX
٠.	1 (APP) 1 (APP	XXXX
	Less: Standard rate	XXXX
	Difference in rate	2013/3/
	x Actual hours	XXXX
	Labor rate variance	XXXX

B. LABOR EFFICIENCY VARIANCE

2. Actual hours x Standard rate

The labor efficiency variance is caused by using more or less than the standard amount of labor hours to produce a product or complete a process.

#### **Formulas**

1. Labor efficiency variance = Standard rate x (Actual hours less Standard hours)

4.	Actual hours x Standard rate	XXXX
	Standard hours x Standard rate	$\underline{XXXX}$
	Labor efficiency variance	$\underline{\mathbf{X}}\underline{\mathbf{X}}\underline{\mathbf{X}}\underline{\mathbf{X}}$
3.	Actual hours 100 Williams 100 W	XXXX
	Less: Standard hours	XXXX
	Difference in hours	
	x Standard rate	XXXX
	Labor efficiency variance	XXXX
		VVVV

AH	Q + # + 10	Actual Hours
AR	i i <del>t</del> eo	Actual Rate
SH	=	Standard Hours
SR	+	Standard Rate

## The possible causes of labor rate variance

- 1. Hiring of inexperienced workers
- 2. Change in labor rate
- 3. Hiring of workers with pay higher than that assumed when the standard for a job was set.

# The possible causes of labor efficiency variance

- 1. Lack of training for workers
- 2. Poor scheduling of work
- 3. Lack of supervision
- 4. Faulty equipment

#### 111. OVERHEAD VARIANCES

#### A.ONE-FACTOR METHOD

Actu	1) al Factory erhead			(2) Applied FO SH x FO rate
ν		8	the control of the	9 15 0 2
	27	COTAL OVERUEA	DVADIANCE	1.27

#### Formula

Actual factory overhead	XXX
Less: Standard hours x Standard FO rate	XXX
Total factory overhead variance	XXX

COMBINED MANUFACTURING OVERHEAD (VARIABLE AND FIXED)
VARIANCE ANALYSIS

A. If the company is using a flexible budget, the total overhead variance may be analyzed using (a) Two-variance method (b) Three-variance method and (c) Four-variance method

## A. TWO-VARIANCE METHOD

(1) tual Factory Overhead	(2) Budget allowed on Standard Hours	(3) SH x FO rat
	<b>*</b>	CARAVILLA MARTINO.
Controllable varia		lume variance 2) minus (3)

#### Formulas

#### 1. Controllable (Budget) Variance

Actual factory overhead		XXXX
Less: Budget allowance based on std. hours	1 1	
Fixed overhead	XXXX	
Variable (std. Hours x Variable rate)	XXXX	XXXX
Controllable Variance	31	XXXX

## 2. Volume (Capacity or Production) Variance

Budget allowance based on std. hrs.		
Less: Std. hrs. x Std. OH rate		XXXX
Volume variance	bruttinger greater	XXXX
Volume variance	K a daylon bourbon	XXXX

The first variance is called controllable variance because it is believed that the manager of supervisor has some control over this combined spending and efficiency variance. The volume variance is sometimes called **denominator** variance because the denominator to calculate the fixed factory overhead application rate. The alterative formula is shown on the next page.

	Denominator direct laborate and the state of	44444
,	Denominator direct labor hours (used in computing Fixed OH rate	XXXX
	Less. Standard direct labor hours allowed	XXXX
	Difference in number of hours	XXXX
	X Standard fixed factors	
	X Standard fixed factory overhead application rate	$\underline{XXXX}$
	Production volume (volume variance)	XXXX

# B. THREE-VARIANCE METHOD

(1) Actua	(2) l Factory Budget al on actual		
- A	Spending variance	Variable Efficiency Variance	Volume Variance
	(1) minus (2)	(2) minus (3)	(3) minus (4)

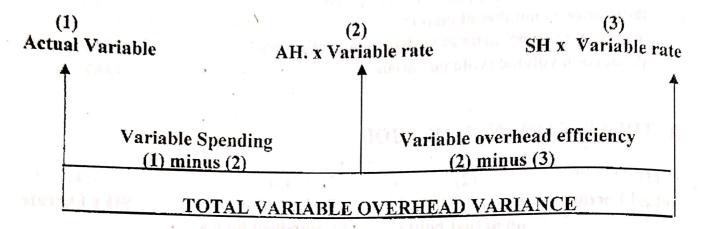
## Formulas

1.5					
	Actual factory overhea	da emirora, astalesto	outs the ages.	XXXX	
	Less: Budget allowand	e based on actual hrs.			
	Fixed overhead		XXXX	BILLI	
	Variable (actual h	rs. x variable rate)	<u>XXXX</u>	XXXX	
	Spending variance	Budge to Pearl as		XXXX	
	Partial Care	M. Regar Tomora?			
2.	Variable efficiency var	iance		· ·	
	Budget allowance base	ed on actual hours		XXXX	
	Less: Budget allowan	ce based on std. hours		XXXX	
	Variable efficiency var	riance		XXXX	
3.	Volume variance		don argendereq	Fried	
	Budget allowance base	ed on std. hours	The depth !	XXXX	
	Less: Std. hrs. x facto	ry overhead rate		$\underline{XXXX}$	
	Volume variance	A div This tab data.	LIAIVI	XXXX	

the provided of and off and other medical editions of the contract of

no pari di parase ŝi li un prima aliante di mini di se si li su prima di mini di m

## C. FOUR-VARIANCE METHOD A.VARIABLE OVERHEAD VARIANCE



#### **Formulas**

1.	Actual variable factory overhead	XXXX
	Less: Actual hours x variable overhead rate	XXXX
	Variable spending variance	XXXX
•	and the second s	to profit at a malar second
2.	Actual hours x variable overhead rate	XXXX
	Less: Standard hours x variable overhead rate	XXXX
	Variable efficiency variance	XXXX

The possible causes of variable overhead efficiency variance

Efficiency is using the bases on which variable overhead is applied. If the base used in applying variable overhead is direct labor hours, then the causes of the labor efficiency variance will also be the causes of the variable overhead efficiency variance.

# B.FIXED OVERHEAD VARIANCE (1) (2) (3) Actual Fixed Budgeted Fixed at SH x Fixed Rate Normal Capacity Fixed spending variance (1) minus (2) (2) minus (3) TOTAL FIXED OVERHEAD VARIANCE

#### Formulas:

1,	Actual fixed overhead  Less: Budgeted fixed overhead at normal capacity  Fixed spending variance	xxxx <u>xxxx</u> <u>xxxx</u>
2.	Budgeted fixed overhead at normal capacity Less: Standard hours x Fixed overhead rate Volume variance	xxxx xxxx xxxx

## Possible causes of volume variance

- 1. Poor production scheduling
- 2. Unusual machine breakdowns
- 3. Shortage of skilled workers
- 4. Decrease in demand from customers
- 5. Unused plant capacity

For all efficiency variances, an alternative computation may be made as follows:

Actual hours	XXXX
Less: Standard hours allowed	XXXX
Difference in number of hours	XXXX

The difference in hours will be multiplied by the labor rate if the requirement is direct labor efficiency. If the requirement is variable overhead efficiency, then the difference in number of hours will be multiplied by the variable overhead rate. If the requirement is fixed overhead efficiency, then the difference in number of hours will be multiplied by the fixed overhead rate.

111,000

# ILLUSTRATIVE PROBLEM 1

Last mo	onth, the following events took place at Shangrila Comp	any.
a.	Produced 50,000 plastic microcomputer cases.	una bassion bankis i
b.	Standard variable costs per unit (per case)  Direct materials; 2 pounds at P1.00	P2.00 1.50
	Direct labor; .10 hours at P15 Variable manufacturing overhead ,10 hrs at P5	0.50
c.	Fixed manufacturing overhead cost	notice to receive
	Monthly budget – for 40,000 cases or 4,000 standard hours	P 80,000
d.	Actual production costs	
	Direct materials purchased 200,000 lbs.at P1.20	240,000
	Direct materials used – 110,000 lbs at P1.20	132,000
	Direct labor – 6,000 hours at P14	84,000
	$\mathbf{r}$	

## Requirements:

- 1. Compute the materials, labor and overhead variances.
- 2. Journal entries to record the given information.

Factory overhead

#### SOLUTION

## 1. Materials variances

	THE THE PERSON NAMED CO.		4.
a.	Materials price (purchase) variance Actual price	opposite in the state of	D 1 20
	Less: Standard price		P 1.20
5	Difference in price		0.13 - 1.00
	X Actual quantity purchased		0.20
	Materials price variance – unfavorable		<u>200,000</u>
	ania volable		P40,000
b.	Material quantity variance		
	Actual quantity used		
	Less: Standard quantity allowed (50,000 x 2)		110,000
	Difference in quantity		100,000
,	X Standard price	Y to Miles	10,000
	Material quantity variance		P 1.00
			P10,000

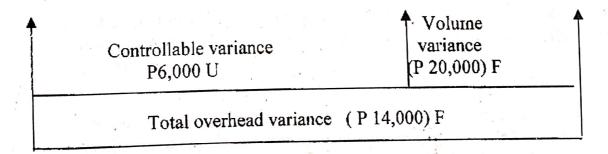
# Chapter 13 Standard Costing

2.	Labor variances	
-	a. Labor rate variance	
	Actual rate per hour	P 14.00
	Less: Standard rate per hours	12.00
	Difference in rate	(1.00)
	X Actual hours used	6,000
	Labor rate variance	(P 6,000)
	b. Labor efficiency variance	antimos contaits 17
	b. Labor efficiency variance Actual hours used	6,000
,		- 000
	Less: Standard hrs. allowed (50,000 x .10) Difference in hours	1,000
	2 interested in flours	P 15.00
	X Standard rate per hour	P 15,000
	Labor efficiency variance	1
2.	Factory overhead variance	
~.		oue J. Million Million will Out of the contract of the contrac
	A ITTO TOWNS ON ON WASTE ON	cikacasa bak mandi i
	1. Controllable variance	ing a strong respect to the first Miles
	Actual factory overhead	P 111,000
	Less: Budget allowed on standard hours	The second control of the second
	Fixed P	80,000
	Variable $(50,000 \times .10 \times 5)$	5,000 105,000
	Controllable variance - unfavorable	P 6,000
	2. Malanda mariango	Committee to the state of the
	2. Volume variance  Budget allowed on standard hours	P 105,000
	Less: Standard hrs. x Factory overhead rat	125,000
	$(50,000 \times .10 \times 25)$	(P.20,000)
ì	Volume variance - favorable	( <u>r. 20,000</u> )
	B. Three-variance method	Rimin Lin
	1. Spending variance	r Will in the same
	Actual factory overhead	P 111,000
	Less: Budget allowed on actual hours	top the contract of A
	Fixed P	80,000
	Variable (6,000 x P5.00)	30,000 110,000
	Spending variance – unfavorable	P 1.000
	Spending variance - diffavorable	

	2.	Variable Efficiency variance	490 m. 1087	Milliand
		Budget allowed on actual hours	P 110,0	
		Less: Budged allowed on standard hours	105,00	
	10	Variable efficiency variance – unfavorable	P 5,0	00
		variable efficiency variance	my or (NG	
	3.	Volume variance	nuts/ /	
		Budget allowed on standard hours	P 105,00	
		Less: Std. hrs. x factory overhead rate	125,00	
		Volume variance – favorable	( <u>P_20,00</u>	<u>)()</u>
		(NO)		
C.	Fo	ur-Variance method		
	1.	Variable Spending Variance		
		Actual variable factory overhead	P 36,000	)
		Less: Actual hours x VO rate (6,000 DLHrs. X P5)	30,000	
		Variable spending variance	P 6,000	)
e. No	2.	Variable Efficiency Vatiance	Despuis de la constante de la	
		Actual hours x variable overhead rate	P 30,000	4
		Less: Std. hours x VO rate (50,000 x .10 x P5)	25,000	
		Variable efficiency variance	P 5.000	
		Reserve endustrial		· ·
	3,	Fixed Spending Variance		
		Actual fixed overhead	P 75,000	
		Less: Budgeted fixed overhead at normal capacity	80,000	
		Fixed spending variance	(P 5,000	Λ
			<u>t 1 3,000</u>	<b>⊒</b>
	2.	Volume Variance	or mounts of	
		Budgeted fixed overhead at normal capacity	D 90 000	
		Less: Std. hours x Fixed OH rate (5,000 x P20)	P 80,000	,
		Volume variance	100,000	
		2010 1 20 adding a 1 a million and a million	(P20,000)	
TOT	TT 3.7	A E PORTORIO	M. M. Dellas	
JOU	KN	AL ENTRIES		
	1 .	2,75		
,	1.	Materials Inventory (200,000 x P1.00)	200,000	
		Material Price Variance	40,000	
		Accounts Payable (200,000 x P1.20)		240,000
	_	GORDO EL COLORO DOS EL CONTRO DE CALLO EL CONTRO DE CALLO DE CONTRO DE CALLO DE CALL		240,000
	2.	Work in process (50,000 x 2)	100 000	
		Material Efficiency Variance	100,000	
		Materials Inventory	10,000	110 00
en f				110,00

#### Chapter 13 Standard Accounting 421 3. Payroll 84,000 Accrued Payroll 84,000 Work in Process (5,000 hrs. x P15) 75,000 Labor Efficiency Variance 15,000 Labor Rate Variance 6,000 Payroll 84,000 Factory Overhead Control . 5. 111,000 Various credit accounts 111,000 Work in Process (5,000 hrs. x P 25) 6 125,000 125,000 Factory Overhead Applied 125,000 Factory Overhead Applied Factory Overhead Controllable Variance 6,000 20,000 Factory Overhead Volume Variance 111,000 Factory Overhead Control Analysis of factory overhead One-factor P 111,000 Actual factory overhead

Two-factor



125,000 (P 14,000)

Less: Applied overhead

Total variance

6. Ms.

## Three-factor

Spending	Efficiency	Volume
Variance	variance	variance
P 1,000 U	P 5,000 U	(P 20,000) F
	Winds and America	and a second service

Transmit of the Annual Contract of the Annual Contract

(head) (seather) (reside)

#### Four-factor

Variable Spending Variance P6,000 U	Fixed Spending variance (P5,000) F	Efficiency variance P 5,000 U	Volume variance ( P20,000) F
То	tal overhead va	riance (P 14,000	) F

# TRUE-FALSE QUESTIONS

Indicate whether the following statements are true or false by inserting in the blank space provided a capital "T" for true or "F" for false.
1. The method of establishing a standard does not determine if it is ideal, oral or expected.
2. A standard cost system is applicable only to process costing where the operation is repetitive.
3. Standard costing are not fixed standards, but most often revised because of changes in wage rates, material prices, and production methods.
4. Unlike flexible budgets, fixed budgets can be prepared for more than one possible volume
5. Time and motion studies are not relevant to the development of a standard cost system.
6 A variance with a debit balance indicates favorable performance.
7. When overhead is applied on the basis of direct labor hours, if the labor efficiency variance is unfavorable, the variable overhead efficiency variance is also unfavorable.
8, The material price variance is composed as the difference between actual price and standard price per unit of raw material times the standard quantity of materials used.
9. When more hours of direct labor are necessary to complete a process then the standard allows, a labor rate variance exists.
10. The sum of spending variance and variable efficiency variance is equal to controllable variance.

## MULTIPLE CHOICE

- 1. Which of the following variances is least helpful for control purposes?
  - Material efficiency variance
  - Production volume variance b.
  - Variable overhead controllable variance c.
  - Labor rate variance d.
- 2, Which of the following is true of standard costing?
  - Standard costing uses predetermined overhead rates times a standard base,
  - b. Standard costing uses actual rates times a standard base.
  - C. Standard costing uses an actual base times a predetermined rate.
  - d. Standard costing uses actual rates exclusively
- What type of direct material variances for price and efficiency result if actual number of pounds of material used exceeds overhead pounds allowed but actual cost per pound was less than standard cost per pound?

Efficiency

Price

Favorable . a.

Favorable

b. Favorable

Unfavorable

Unfavorable

Favorable

Unfavorable Unfavorable

- 4. Standard costing will produce the same results as actual or conventional costing when standard cost variances are allocated to
  - cost of goods sold and inventories a.
  - a balance sheet account b.
  - an income and expense account
  - d. none of the above
- When computing variances from standard costs, the difference between actual 5. and standard price multiplied by actual quantity yields a
  - combined price-quantity variance
  - price variance b.
  - volume variance. C.
  - mix variance

## Chapter 13 Standard Costing

- 6. What does a credit balance in a direct labor efficiency variance account indicate?
  - a. The average wage rate paid to direct labor employees was less than the standard rate.
  - b. The standard hours allowed for the units produced were greater than actual direct labor hours used.
  - c. Actual total direct labor costs incurred were less than standard direct labor costs allowed for the units produced
  - d. The number of units produced was less than the number of units budgeted for the period.
- 7. If raw materials are carried in the raw materials inventory at standard cost, then it is reasonable to assume that
  - a. the price variance is recognized when materials are purchased
  - b. the price variance is recognized when materials are placed into production
  - c. the company does not follow generally accepted accounting principles
  - d. the raw materials inventory account is overvalued
- 8. In a standard cost system, when production is greater that the estimated unit or denominator level, there will be
  - a. unfavorable capacity variance
  - b, a favorable materials and labor usage variance
  - c. a favorable volume variance
  - d. a favorable budget variance
- 9. Suppose a standard cost system is being used. What do you call the variations in the use of materials which can be calculated by comparing the record of materials withdrawn with the standard consumption?
  - a. Volume variance
  - b. Quantity variance
  - c. Efficiency variance
  - d Price variance
- 10. Which department is customarily held responsible for a material usage variance?
  - a. Quality control
  - b. Purchasing
  - c. Engineering
  - d Production

## **PROBLEMS**

## Problem 1

You have been given the following information of Michelle Corporation for June.

Actual labor hours used	3,150 hours
Standard materials price	P 2.50 per unit
Actual labor rate per hour	P 3.00
Standard quantity of materials used	4,050 units
Standard labor hours used	3,000 hours
Actual materials price	P 2.52 per unit
Standard labor rate per hour	P 3.10
Actual quantity of materials purchased and used	4,450 units

# Requirements: Compute the following

- 1. Material price variance Materials efficiency variance
- Labor rate variance
- 4. Labor efficiency variance

#### Problem 2

Longview Hospital performs blood tests in its laboratory. The following standards have been set for each blood test performed.

<u>Item</u>	Std. Price or Quantity	Std Pata on II
Direct materials	2 plates	Std. Rate or Hours
Direct labor	0.2 hours	P 2.75 per plate
Variable overhead	0.2 hours	P 15.00 per hour
	Ory performed 1 500 11	P 7.00 per hour

During May, the laboratory performed 1,500 blood tests. On May 1 there were no plates on hand; after a plate is used for a blood test it is discarded. Variable overhead is assigned to blood tests on the basis of direct labor hours. The following events occurred during May.

- A) 3,600 plates were purchased at a cost of P9,540
- B) 3,200 plates were used for blood tests
- C) 340 actual direct labor hours were worked at a cost of P5,100 Requirements: Compute the following.
  - 1. The material price variance
  - The material quantity variance
  - 3. The labor rate variance
  - 4. The labor efficiency variance
  - 5. The variable overhead efficiency variance

Problem 3

Golden Shower Company has a budgeted normal monthly capacity of 5,000 labor hours with a standard production of 4,000 units at this capacity. Standard costs are:

2 kilos at P1.00 Materials P8.00 per hour Labor

Factory overhead at normal capacity

P5,000 Fixed expenses

Variable expenses with a constitution of P 1.50 per labor hour to the state of the

During January, actual factory overhead total P11,250 and 4,500 labor hours cost P33,750. Production during the month was 3,500 units using 7,200 kilos of materials at a cost of P1.02 per kilo.

Required: Two variances for materials, labor and overhead.

Problem 4

The Fenton company manufactures one product and provides you with the following information for the year 2019 disco bas index at a sense

	155,000
Normal direct labor hour	P4.00
Standard fixed overhead rate Standard fixed overhead cost per unit	P10.00
Standard fixed overhead cost per unit	60,000
Units manufactured- actual	148,000
Actual direct labor hours	P475,000
Actual overhead- Variable	632,500
Fixed	P1,085,000
Total budgeted overhead	100,000,00

Required:

- 1. Compute the variable overhead spending and efficiency variances Compute the fixed overhead spending and volume varia
- 3. Compute the variances using 2-way method
- 4. Compute the variances using 3-way method
- 5. Compute the variances using 4-way method there was no work in process meeting on famility 31, 2016, and 5,000 tables

Problem 5 GDL Company uses a standard cost system.	The company's standard cost per unit
were: was a second seco	D 20.00
Direct materials 20 pounds at 1	15,00
Diect labor 1 hour at P15.00	5.00
Variable overhead: 1 hour at P 5.00	12.00 Language to 1.2.00
Fixed overhead: 1 hour at P 2.00 Total	<u>P 42.00</u>
Fixed overhead is based on a production of 40,0	00 units during the month.

Fixed overhead is based on a production of 40,000 un

Act	ual costs for the month	
	Direct materials purchased	2,000,000 lbs. at P1.20
utvi d	Direct materials used	1,200,000 lbs.
	Actual direct labor	50,000 hrs.P 14.00/hr.
	Variable overhead	P 280,000
	Fixed overhead the bas poor lateration	P 83,000
	Units completed	40,000 units
). 	Work in process, beg. (80% complete)	10,000 units
,	Work in process, end (50% complete)	20,000 units
are:	added 100% at the bearings	

Materials are added 100% at the beginning.

Required: Two-variances for materials, labor and overhead

#### Problem 6

The Mentor company manufactures butcher block tables. Each table requires the following direct materials, direct labor and overhead.

2" clear maple Direct labor Variable overhead Fixed overhead Total	Standard Quantity 12 bd. ft. 2 hours 2 hours 2 hours	Price (Rate)       Std. Cost         P1.00 per bd. ft.       P12.00         P9.00 per hour       18.00         P2.50 per hour       5.00         P2.00 per hour       4.00
During Ionus at C. 1	neighbor and efficiency	<u>P39.00</u>

During January, the following transactions occurred:

- Purchases of lumber amounted to P63,525. The price paid was P1.05 per board foot. There was no direct materials inventory at the beginning or end of the month. The price variance is recorded at the time of purchase.
- 2. The direct labor cost was P96,075. The hourly rate of pay was P9.15.
- 3. There was no work in process inventory on January 31, 2016, and 5,000 tables

The accept a marrian at a cost of T

## Chapter 13 Standard Costing

Variable P27,000 Fixed 24.500

The budgeted capacity for the year is 72,000 units or 144,000 direct labor hours. The company's policy is to record all variances and close them to cost of good sold at the end of each month. Sales for the month were 4,500 tables at a price of P100 per table. All sales are made on account.

Required:

1. Compute for all variances

2. Give the journal entries to record all transactions for January, 2012.

the letter made for the property to not good and The Risk Company provides you with the following information for the year 2019: Problem 7

sk Company provides you want or	p 3 per DLH
Standard variable overhead rate	303,750
Actual variable overhead	299,950
Actual fixed overhead	
Variances:	750 unfavoral
Variable spending	900 favorable

ble 900 favorable Variable efficiency 4,950 unfavorable Fixed spending 3,835 favorable सारवीकाराम नार्ने ते लेख वास सामी प्रातिकारोधि Fixed volume

Required: Compute for the following: designed ashoow assured graqued a sould as

Standard hours allowed 1.

Actual direct labor hours 2.

Applied overhead to production

Problem 8

The following selected data were taken from the books of Liberty Co.: P 3.75

Actual wage rate

P 3.50 Standard hours allowed for actual production 10,000 Labor efficiency variance P 4,200 U Direct labor from the 31,000 hours on rodal scorid

Required: Calculate the actual hours worked rounded to the nearest hour.

MULTIPLE CHICE - PROBLEMS

During August, 2019, a company produced 1,000 units of a product using 3,600 pounds of direct material at a cost of P2.20 per pound. The direct material standard requires 4 pounds of material per unit of product at a standard price of P 2.00 per pound.

- The material efficiency variance is 11
  - a. P 880 unfavorable that domest and a timoria out
  - b. P 880 favorable
  - c. P 800 favorable
  - d. P 800 unfavorable

The standard direct labor cost for a product is 3 hours at P6 per hour. Budgeted production was 10,000 units for the year and actual production was 12,000 units. Actual direct labor cost was P210,375 for 38,250 hours.

carried an enormalism of the broper of seismo humbrol arts evolutions

2. Compute for (1) The labor rate variance and (2) labor efficiency variance

- a. (1) P 19,125 F and P 13,500 U
- b. (1) P 19,125U and P 13,500 F
- c. (1) P 19,125 F and P 49,500 U
- d. (1) P 19,125 U and P 49,500F

The following data are used for questions 3 to 12

The Big Book Company builds wooden bookshelf wall units. The company's standard

Wood 25 pounds at P6.40 per pound Trim

8 pounds at P10.00 per pound Direct labor 5 hours at P12.00 per hour

Variable overhead P 30.00 per unit

Fixed overhead P 130,000 per period, applied at the rate of

P20.00 per unit

A recent month's transactions were: 160,000 pounds of wood were purchased at P6.50 per pound; 50,000 pounds of trim were purchased at P9.60 per pound. 155,000 pounds of wood were issued to production; 48,500 pounds of trim were issued to production. Direct labor incurred was 31,000 hours at an average cost of P 11.50 per hour. Overhead costs were P302,000, of which P 181,000 were variable. Six thousand units

H 209 6119 h

Direct when ellipseur various (liverally

### Chapter 13 Standard Costing

3	What was	the total actual	cost of	wood	purchased?
	a P	1.007.500 .		- Marine & D. R.D. F.	GAN SHOWNERS

- b. P 1,024,000
- P 1,040,000 C.
- d. P 480,000

#### 3. What was the total standard cost of wood purchased?

- a. P 500,000
- b. P 992,000
- c. P 1,024,000
- d. P 1,040,000

#### 4. What was the wood price variance?

- a. P 48,000 F
- b. P 16,000 U
- c. P 48,000 U and a suggestive positive of the second state of the
  - d. P 16,000 F

## 5. What was the total actual cost of trim purchased?

- a. P 1,488,000
- 500,000 b. P
- 465,600
- down at d. P 480,000 will sell have a real and of the real selections and the selection of the selection of

## What was the trim price variance?

- A. P 5,000 F
- b. P 20,000 U
- c. P 5,000 U
- d. P 20,000 F

# 7. What was the trim efficiency variance?

- a. P 10,000 F
- b. P 20,000 U
- c. P 5,000 U
- d. P 15,000 F

# What was the direct labor price variance?

- a. P 12,000 F
- b. P 15,500 F
- c. P 3,500 F
- d. P 19,000 F

- What was the direct labor efficiency variance?
  - a. P 3,500 U
  - b. P 3.500 F
  - c. P 12,000 U
  - d. P 15,500 F
- 10. Using the two-way variance analysis for combined fixed and variable overhead, what was Big Book's overhead spending variance?
  - a. P 1,000 U
  - b. P 8,000 F
  - c. P 9,000 F
  - d. P 10,000 U
- 11. Using the two-way variance analysis for combined fixed and variable overhead, what was Big Book's overhead production volume variance?
  - P 1,000 U
  - b. P 10,000 U
  - C. P 9,000 U
  - d. P 10,000 F

Janice Company uses the standard cost system. The following information on its direct labor costs are provided.

Standard direct labor hours	
Actual direct labor hours	75,000
Direct labor efficiency variance (favorable)	72,500
Direct labor rate variance (favorable)	P10,000
Total payroll	14,500
	275,500

who del roomb say delve to div

- 13. What is Janice Company's actual direct labor rate?
  - a. P0.20
  - b. P4.00
  - c. P3.60
  - d. P3.80

Staff Company uses a standard cost system. Information for raw materials for Product RB for the month of October is as follows:

RB for the month of October is as follows:	P1.6
Standard unit price	P1.5
Actual purchase price per unit	2,000 unit
Actual quantity purchased	
Actual quantity used	1,,,00 41111
Standard quantity allowed for actual production	1,800 unit
14 What is the material purchase price variance?	AST N
D 00 forwardle	

- a. P 90 favorable
- b. P 90 unfavorable
- c. P100 favorable
- d. P100 unfavorable

Information on Marvin Company's direct materials costs is as follows:

nation on Marvin Company's direct materials cost	20,000
Actual units of direct materials	P 40,000
Actual direct materials cost	P 2.10
Standard price per unit of direct materials	P 3,000
Direct material efficiency variance (favorable)	Authorities and an analysis

nouve usual is a corp to come to present the same to a

- 15. Marvin Company's direct material price variance was
  - a. P1,000 favorable
  - b. P1,000 unfavorable for but was the off of the bond and the same and c. P2,000 favorable

  - d. P2,000 unfavorable

Home Company manufactures tables with vinyl tops. The standard material cost for the vinyl used per Type-R table is P7.80 based on six square feet of vinyl at a cost of P1.30 per square foot. A production run of 1,000 tables in January resulted in usage of 6,4000 square feet of vinyl at a cost of P1.20 per square foot, at a total cost of P7,680.

- 16.. The usage variance resulting from the above production run was to druga. P120 favorable maint to two doubt spating to the H

  - b. P480 unfavorable
  - c. P520 unfavorable
  - d. P640 favorable

Justine Corporation uses a standard cost system. Direct labor information for product

TEN for the month of June is as follows: Standard rate

P6.00 per hour

Actual rate paid

P6.10 per hour 1,500 hours

Standard hours allowed for actual production

P600 unfavorable

Labor efficiency variance

- 17. What are the actual hours worked?
  - a. 1.400
  - b. 1,402
  - c. 1,598
  - d. 1,600

Selina Company established a standard cost on direct materials at P25 per unit. Actual cost of direct materials fluctuated during the period. Of the 10,000 units purchased, 60% had a cost of P24.70, 20% were purchased at P24.90 and the remaining units at a cost of P25.60

- 18. What is the direct material cost variance?
  - a. P3,000 unfavorable
    - b. P6,000 unfavorable
    - c. P 800 favorable
    - d. P 100 unfavorable

Wham produces one product only, Whammy, and uses the standard cost system. The direct labor standard cost of Whammy is 1.5 hours at P180.00 per hour. The actual hours used is 1,000 hours at P183.00 per hour. The company produced 500 units. 19. What is the unfavorable direct labor efficiency variance?

ne Company manufactures tables with viryl rops. The

the vinish used per Type it sable is PP by hysed on six save

- P45,750
- P15,000
- P15,750
- P45,000

esider free l'apres nonceapean a rest rest per 0 ? Nicole Company uses a standard costing system in connection with the manufacture of a "one size fit all" article of clothing. Each unit of finished product contains 2 yards of direct materials. However, a 20% direct material spoilage calculated on input quantities occur during the process. The cost of direct material is P3.00 per yard. 20. The standard direct material cost per unit of finished product is

- b. P6.00
- c. P7.20
- d. P7.50

390 hours at a cost of P 4,875

## Chapter 12 Standard Costing

Nikki Agri. makes and sells a lawn fertilizer called Fastgro. The company has developed a standard costs for one bag of Fastgro as follows:

Item	Standard Quantity	Std. Cost/bag
Direct materials	20 pounds	P8.00
Direct labor	0.1 hours	1.10
Variable overhead	0.1 hours	0.40
	•	

The company had no beginning inventories of any kind on January 1. Variable overhead is applied to production on the basis of direct labor hours. During January, the following activity was recorded by the company. 85,000 pounds at a cost of P32,300.

P1,475

4,000 bags

3,000 pounds

Direct materials purchased

Direct labor hours worked

Actua' Variable Mfg. Overhead

Production of Fastgro

Inventory of direct materials- Jan. 31

21. The material price variance for January is

- a. P1,640 F
- b. P1.700 F
- c. P3,650 U
- d. P1,300 U
- 22. The material quantity variance for January is
  - a. P800 U
- terrors but P300 Uking in sku su bir to a kylo fosnik kasa in nami s
  - c. P300 F
  - d. P750 F
- 23. The labor rate variance for January is
  - a. P475 F .
  - b. P475 U CoolP585 Fig. 102 apply his requirements and the light of the incommend

  - d. P585 U
- 24. The total variance for variable overhead for January is on vety and bewells visitation that the visitation business.
  - a. P 85F
  - b. P 40F
  - c. P100 U
  - d. P125 F

The David Company makes and sells a single product called Goliath and employs a standard costing system. The following standards have been established for one Goliath.

Direct materials

6 board feet

P9.00

Direct labor

0.8 hours

9.60

There were no inventories of any kind on August 1. During August, the following events occurred.

\*Purchased 15,000 board feet at the total cost of P24,000.

\*Used 12,000 board feet to produce 2,100 Goliath

\*Used 1,700 direct labor hours at a cost of P20,0000

- 25. To record the purchase of direct materials, the general ledger would include what kind of entry to the Material Price Variance account?
  - a. P1,500 credit
  - b. P1,500 debit
  - P6,000 credit
  - d. P6,000 debit
- 26. To record the use of direct materials in production, the general ledger would include what kind of entry to the Materials Quantity Variance account?
  - P3,600 debit a.
  - b. P3,600 credit
  - c. P 900 debit
  - d. P 900 credit
- 27. To record the incurrence of direct labor cost and its use in production, the general ledger would include what kind of entry to the Labor rate Variance account?

  - P240 debit
  - c. P340 debit
  - d. P400 credit

Information on Rex Company's direct material costs for May 2019 is as follows:

Actual quantity of direct materials purchased and used Actual cost of direct materials

30,000 lbs.

Unfavorable direct material usage variance the vo charge and some pro-

P84,000

Standard quantity of direct materials allowed for May production

P3,000

29,000 lbs

# Chapter 13 Standard Costing

- 28. For the month of May, what was Rex Company's direct materials price variance?
  - a. P2,800 favorable
  - b. P2,800 unfavorable
  - c. P6,000 unfavorable
  - favorable d. P6,000

Wallpaper Creation manufactures Madonna wallpaper. The following information relates to production for last quarter.

and the small paper ( 1 mall at P66 00 per roll)		P66.00
White wallpaper (1 roll at P66.00 per roll)	glide to children like	125.00
Pictures of Madonna (25 pcs at P5.00 per p	•	39.00
Direct labor (0.75 hours at P52.00 per hour)	and cross type beauty	18.00
Variable overhead (0.75 hours at P24.00 per hour)	The stranger of	P248.00
Standard cost per unit	11444	200 a 1 1 0 0
able overhead is based on direct labor hours. Actual	jost data for the qu	5 50 -0-

ble overhead is based on direct labor hours. Actual	2 000 rolls at P65 50 per roll
Wallpaper purchased	2,000 rolls at P65.50 per roll
Wallpaper used	38,000 for P182,400
Pictures purchased	37,950
Pictures used	1,090
Actual direct labor hours	P54.00
Average direct labor rate/hour	P28,600
Variable overhead cost	1,500
Rolls produced	20
Rolls sold	What is the permitted with white

- 29. What is the material price variance (white wallpaper) for the quarter?
  - 780 favorable a. P
  - b. P 1,000 favorable
  - c. P 3,960 unfavorable
  - d. P28,040 unfavorable
- 30. What is the material quantity (usage) variance for pictures for the quarter?
  - a. P 0
  - b. P2,250 unfavorable
  - favorable c. P2,250
  - favorable d. P7,600

- 31. What is the labor efficiency (usage) variance for the quarter?
  - a. P 360 unfavorable
  - b. P 50 favorable
  - c. P 1,820 favorable
  - d. P2,180 unfavorable
- 32. What is the variable overhead spending variance for the quarter?
  - a. P 630 favorable
  - b. P 840 favorable
  - c. P1,600 unfavorable
  - d. P2,440 unfavorable

Tub Co. uses a standard cost system. The following information pertains to direct labor for Product B for the month of October.

Actual rate paid P8.40 per hour Standard rate P8.00 per hour Standard hours allowed for actual production 2,000 hours Labor efficiency variance P1,600 unfavorable

- 33. What were the actual hours worked?
  - a. 1,800
  - b. 1,810
  - c. 2,100
  - d. 2,200
- 34. What is the labor rate variance?
  - a. P 720 unfavorable
  - b. P 840 unfavorable
  - c. P 880 unfavorable
  - d. P 880 favorable

Nadal Compsny uses a standard costing system. The 35,000 units of raw materials in inventory were purchased for P105,000 and 2 units of raw materials are required to produce one unit of the product. During the month the company produced 12,000 units. The standard cost allowed for materials is P60,000 and there was an unfavorable quantity variance of P2,500.

- 35. The material quantity variance was
  - a. P 2,500 [J
  - b. P 3.500 F
  - c. P11,000 U
  - d. P12,500 U