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Basic Cost Accounting

BY AZURA MOHD

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PREFACE

This e-book is a module for students studying BASIC COST ACCOUNTING at the Polytechnic level.

BASIC COST ACCOUNTING course is designed for students' enrollment in the dynamic nature of retailing. This course offers a balanced descriptive, how-to, and conceptual approach to understanding retailing and the decisions made by retailers. It also includes some conceptual information to enable the students to understand decision making in different situations

Since this e-book provides notes and a variety of questions covering each topic in this course, it is hoped that the students will be able to recognize appropriately the conceptual approach and information which enable the students to decide on the dynamic nature of retailing.

ACKNOWLEDGEMENT

The highest gratitude to Allah SWT because with His permission, the Basic Cost Accounting Module was successfully published. This e-book is published to enhance students' apprehension on topics learned in Basic Cost Accounting for Retailing course at Malaysia Polytechnic. In preparing this e-book, various challenges and obstacles were faced in the making of it. We would like to express our deepest gratitude to our family, the Polytechnic e-Learning Coordinator, and colleagues for their guidance and support in the production of this e-book.

We would also like to thank the following for permission to reproduce copyright photos: Canva

We sincerely hope that this e-book would be of the utmost advantage to students as well as educators in Malaysia Polytechnic.

Thank you.

Azura Binti Mohd
January 2022.

TABLE OF CONTENTS

CHAPTER 1
INTRODUCTION TO COST ACCOUNTING

OBJECTIVES

General Objective: To understand the definition and role of Cost Accounting as well as the differences between Cost Accounting and Financial Accounting

Specific Objectives: At the end of the unit you will be able to :

- Define Cost Accounting correctly.
- List down the importance of Cost Accounting to the management.
- State the differences between Cost Accounting and Financial Accounting.

1.0 INTRODUCTION

In this topic you will learn and understand the definition and role of cost accounting and the differences between cost accounting and financial accounting. This topic will also help you see the use of cost accounting in other units.

1.1 DEFINITION OF COST ACCOUNTING

The word 'Costing' refers to the technique and process of ascertaining costs. There have been certain rules and principles in the field of costing developed over years by our forefathers. These rules and principles help us to ascertain the cost of products produced. The term 'Cost Accounting' refers to the recording of all incomes and expenditures and ends with the preparation of periodical statements and reports for ascertaining and controlling costs

Definitions of Cost Accounting. According to the Terminology used by the Institute of Cost and Management Accountants, "Cost accounting is the part of management accounting which establishes budgets and standard costs and actual costs of operations, processes, departments or products and the analysis of variances, profitability or social use of funds.

1.2 IMPORTANCE OF COST ACCOUNTING TO THE MANAGEMENT

Cost accounting has the following important objectives:

a) To determine product cost

- ✓ The cost of the product is very important in cost accounting. The total product cost and cost per unit of product are important in making stock valuation, deciding price of the product and managerial decision making.

b) To facilitate planning and control of regular business activities

- ✓ The cost formulation in cost accounting system is oriented to help in planning, control and decision-making. The accumulation, classification and analysis of cost is done in such a way as to help management decision regarding business activities.

c) To supply information for short and long run decisions.

- ✓ Cost accounting system provides data for short and long run decisions of a non-recurring nature. These decision generally involve high cost commitment

Activity 1

1.1 In your own words, define cost accounting.

Answer:

_____

_____

_____

_____

_____

_____

1.2 What are the disadvantages of a company, which does not prepare Cost Accounting?

_____

_____

_____

_____

_____

_____

Feedback Activity

1.1 Cost accounting is a process of evaluation and data processing from activities that occur in certain industries like manufacturing and the information gathered is used in planning, controlling and decision-making.

.

1.2 There are several disadvantages for the company, which does not prepare cost accounting:

a) Difficult for the company to achieve certain goals..
b) Managerial decisions for future performance improvement are difficult to ascertain.
c) Planning process will be inaccurate if the company does not know the cost information.
d) The budgeted product cost will be difficult to be fixed.

1.3 THE DIFFERENCES BETWEEN COST ACCOUNTING AND FINANCIAL ACCOUNTING

	Cost Accounting	Financial Accounting
1. Nature	Classifies, records, present and interprets in a significant manner the material, labour, overhead costs involved in manufacturing and selling each product, job and service.	Classifies, records, presents and interprets in terms of financial character and provides the figures for the preparation of the financial statements.
2. Primary users of information	The users are internal users. They are members of the management.	The users of Financial Accounting statements are mainly external to the business enterprise. External users include shareholder, creditors, financial analyst and government authorities
3. Accounting method	Does not based on the double entry system	Follows the double entry system.
4. Accounting Principle	Does not bound to use the 'generally accepted accounting principles'. It can use any accounting technique that generates useful information.	The 'generally accepted accounting principles' are important and are used extensively.
5. Unit of measurement	Applies any measurement unit that	All information is in term of money.

	is useful in a particular situation; such as labour hours, and machine hours.	
6. Report frequency	Data and statements are prepared whenever needed. Reports may be prepared on a monthly, weekly or even daily basis.	Data and statement are developed for a definite period, usually a year.
7. Time dimension	Concerned with future information as well as past information	Reports what has happened in the past in an organization.

Table 1.1: Comparison between Cost Accounting and Financial Accounting.

Activity

1-3 What are the differences between cost accounting and financial accounting?

	Cost Accounting	Financial Accounting

Feedback Activity

	Cost Accounting	Financial Accounting
1. Nature	Classifies, records, present and interprets in a significant manner the material, labour, overhead costs involved in manufacturing and selling each product, job and service.	Classifies, records, presents and interprets in terms of financial character and provides the figures for the preparation of the financial statements.
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7. Time dimension	Concerned with future information as well as past information	Reports what has happened in the past in an organization.

SELF-ASSESSMENT

Question 1-1

What is Cost Accounting?

Answer:

_____

_____

_____

_____

Question 1-2

List four roles of cost accounting to the management.

Answer:

_____

_____

_____

_____

Question 1-3

Financial Accounting is the process of:

1. _____
2. _____
3. _____
4. _____

Feedback Self-Assessment

1-1 Cost accounting can be defined as a part of the management accounting which provides budgeted cost and actual operation, processing from activities that occur in certain industries like manufacturing and the information gathered is used in planning, controlling and decision making.

1-2 The importance of cost accounting to the management

a) To determine product cost

The cost of the product is of prime importance in cost accounting. The total product cost and cost per unit of product are important in making stock valuation, deciding price of the product and managerial decision making.

b) To facilitate planning and control of regular business activities

The cost formulation in cost accounting system is oriented to help in planning, control and decision-making. The accumulation, classification and analysis of cost is done in such a way as to help management decision regarding business activities.

c) To supply information for short and long run decisions.

Cost accounting system provides data for short and long run decisions of a non-recurring nature. These decision generally involve high cost commitment

1-3 Financial accounting is the process of:

1. Classified
2. Record
3. Present
4. Interprets transactions.

CHAPTER 2
ELEMENTS OF COST

OBJECTIVES

General Objective : To understand the elements of cost and its classifications.
To understand the relationship between factory organization and Costing System.

Specific Objectives : At the end of the unit you will be able to:

- Classify the elements of cost
- State the relationship between factory organization and Costing System.

2.0 INTRODUCTION

Total cost can be separated under three broad headings: material, labour, and overhead. These groups of expenditure are known as the elements of cost. Classification is the process of arranging items into groups according to their degree of similarity and is formally defined as:

"*the arrangement of items in logical groups having regards to their nature of purpose. The first part of this definition relates to the nature of expenditure e.g expenditure on raw materials and the latter part indicates where the expenditure is to be charged.*"

2.1 THE ELEMENTS OF COST AND ITS CLASSIFICATION

In carrying out its activities, a company will incur many different types of costs. It has to pay for the raw materials, labour, rental, royalty, pattern, copy wright, electricity, advertising, interest on bank loan, and many other cost items.

For ease of use and analysis, these costs are generally classified according to their function: Production costs, Administration costs; Marketing and Distribution costs, Financing costs and Research and Development costs.

2.1.1 The Analysis Of Total Costs

The elements of cost consist of:

a) Direct materials
b) Direct wages
c) Direct expenses
d) Overhead
    i) Production
    ii) Administration
    iii) Selling and distribution

Direct Material

All materials that become a part of the product, of which the costs are directly charged as part of the prime cost is referred to as direct material. In other words, direct material is the material that can be measured and charged directly to the cost of the product.

Some examples of **direct materials** are: raw cotton in textile, rubber to make tyre and crude oil to make diesel fuel. Other material such as nail, glue and varnish are classified as **indirect materials.**

Direct Wages

Direct wages are incurred in altering the construction, composition, conformation or condition of the product. The wages paid to skilled and unskilled workers for this purpose can be allocated specifically to the particular accounts concerned.

For example, carpenters and machine operators are treated as **direct labour** because these are people who work directly on the materials and actually make the product.

Whereas, foremen, supervisors, electricians are treated as **indirect labour** because they are not involved in the actual manufacturing of the product.

Direct Expenses

Direct expenses include any expenditure other than direct material or direct labour that are directly incurred on a specific cost unit. Such special necessary expense is charged directly to the particular account concerned, as part of the prime cost. Examples of direct expenses are as follows:

i) Royalty, pattern, copy write
ii) The hiring of special – or single-purpose tools or equipment for a particular production order or product.
iii) Cost of special layout, designs or drawings.
iv) Maintenance costs of such equipment.

Overhead

The three elements of cost which are mentioned above constitute **prime cost,** and all expense over and above prime cost is overhead.

Formula 2.1

Prime Cost + Production Overhead = Factory Cost

"Overhead" may be defined as the cost of indirect material, indirect labour and such other expenses, including services, which cannot conveniently be charged direct to specific cost units. Alternatively, overheads are all expenses other than direct expenses.

The main groups of overhead are as follows:

a) Production overhead, including services.
b) Administration overhead
c) Selling and Distribution overhead

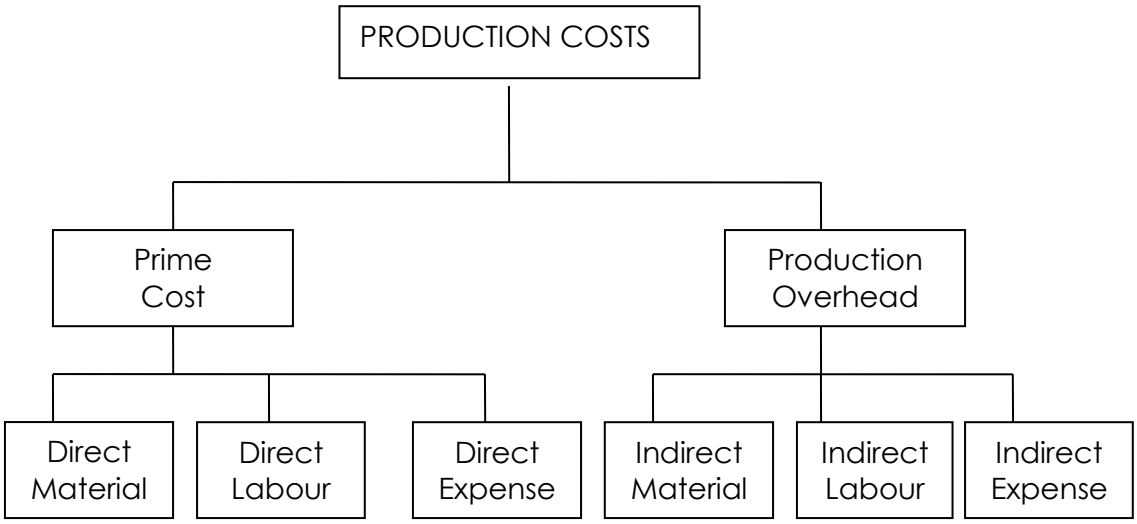


Figure 2.1: Production Costs

2.1.2 Behavior Of Costs: Variable And Fixed

2.1.2.1 Variable Costs

These are costs that change in direct proportion with production activity. For example, when we produce more furniture, we make use of more timber, more carpenters and more royalty are paid. When we produce less furniture, we incurred less of these costs. Let us assumed that the changes in these costs are in direct proportion with the production activity (volume of production).

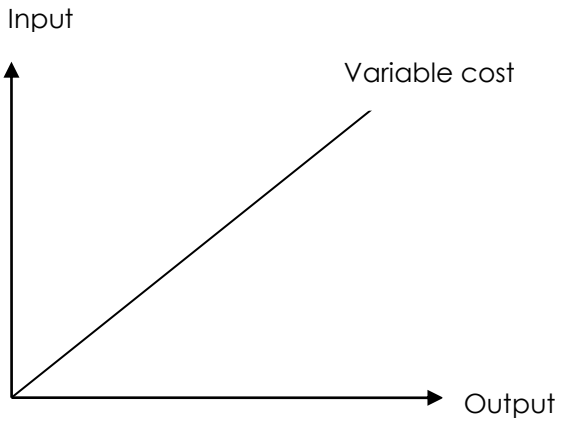


Figure 2.2: Variable costs curve

2.1.2.2 Fixed Costs

These are costs that remain unchanged when production activity changes over a certain relevant range. For example, rental cost will remain constant, and not be affected by production.

Examples of fixed costs include rent, insurance, depreciation, salaries of production staff, wages of supervisors, etc.

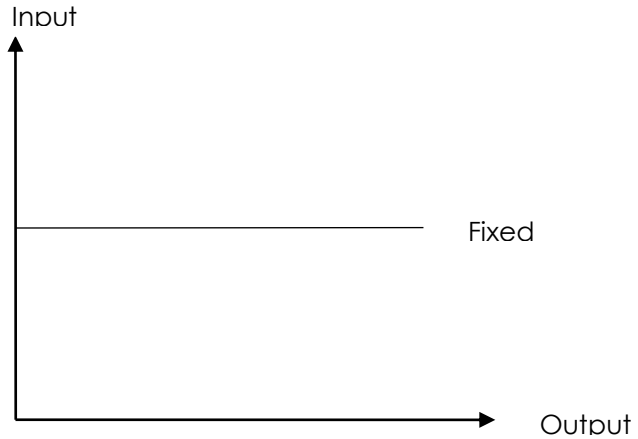


Figure 2.3 : Fixed cost

2.1.2.3 Semi Variable Costs

Semi variable and fixed costs, are made up of fixed and variable elements. It is a combination of semi-variable and semi-fixed costs. The former, semi-variable costs fluctuate with volume due to the effects of the variable components and do not change in direct proportion to output because of the fixed components. The later, semi-fixed costs remained constant up to a certain level of output after which they become variable.

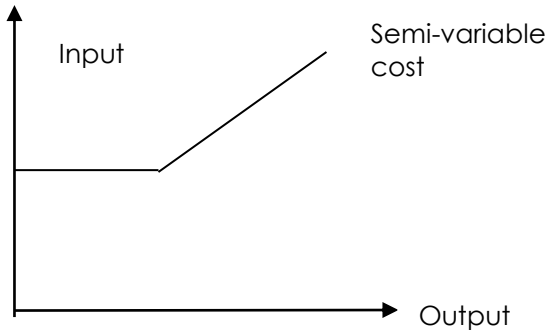


Figure 2.4 : Semi-variable cost

2.1.3 The Statement Of Cost

The cost statement is prepared usually to present the detailed costs of total output during a certain period. It is not based on a double-entry framework. It provides information relating to cost per units at different stages of the total cost of production or at a different stages of completion of the product.

FORMAT FOR COST OF GOODS MANUFACTURED STATEMENT AS FOLLOWS:

The Statement of Cost of Goods Manufactured

For The Year Ended ……

Opening Stock of raw material	XXX
Add: Purchase of raw material	XXX
Less: Closing stock of raw material	(XXX)
Cost of raw material consumed	XXX
Add: Direct labour	XXX
Direct expenses	XXX
Royalty	XXX
PRIME COST	**XXX**
Add: Manufacturing Overhead:	
Indirect wages	XXX
Rent and rates of the factory	XXX
Depreciation of factory's building	XXX
Depreciation of machines	XXX
Manufacturing Cost	XXX
Add: Work in Progress (opening)	XXX
Less: Work in Progress (closing)	(XXX)
COST OF GOODS MANUFACTURED	**XXX**
Add: Administration Overhead:	
Clerk salary	XXX
Stationary	
PRODUCTION COST	**XXX**
Add: Finished Goods (0pening)	XXX
Less: Finished Goods (closing)	(XXX)
Add: Selling and Distribution Overhead:	
Sales expenses	XXX
Promotion	
COST OF GOODS SOLD	**XXXX**

Figure 2.5 : Format of statement of cost

Example 2.1:

Adaiman Manufacturing Company submits the following information on 31 December 2022:

Sales for the year	275 000
Inventories at the beginning of the year:	
Finished goods	7 000
Work-in-Progress	4 000
Purchase of the materials	110 000
Materials inventory :	
Beginning	3 000
Closing	4 000
Direct labour	65 000
Factory overhead was 60% of the direct labour cost	
Inventories at the end of the year:	
Work in Progress	6 000
Finished Goods	8 000
Others expenses for the years:	
Selling expenses 10% of sales	
Administrative expenses 5% of sales	

Based from the above prepare a Statement of Cost.

Solution to Example 2.1:

Adaiman Manufacturing Company

Statement of Cost of Goods Manufactured

for the year ended 31 December 2022

	RM	RM
Materials Consumed:		
Inventory at the beginning	3 000	
Purchases during the year	110 000	
	113 000	
Less: Inventory of materials at the end	4 000	109 000
Direct labour		65 000
PRIME COST		**174 000**
Factory Overhead 60% of labour cost		39 000
Manufacturing cost		213 000
Add: Work in Progress (beginning)		4 000
		217 000
Less: Work in Progress (closing)		6 000
COST OF GOODS MANUFACTURED		**211 000**
Add: Administrative expenses		13 750
COST OF PRODUCTION		**224 750**
Add: Finished Goods (beginning)		7 000
Less: Finished Goods (closing)		(8 000)
Add: Selling Expenses		27 500
COST OF GOODS SOLD		**251 250**
Profit		23 750
Sales		275 000

Activity

2-1 What is meant by direct and indirect cost?

2-2 How would you classify the following in terms of fixed, variable or semi-variable costs?

a) Direct materials
b) Insurance on factory building
c) Direct labour
d) Repair and maintenance
e) Heat, light and power
f) Inspectors' salaries

.

2-3 How would you classify the following in terms of direct or indirect materials?

a) Paper used in printing a book
b) Glass used in spectacles
c) Water used in making ice-cream

Feedback Activity

2-1 Direct costs (comprising direct material costs, direct wages cost and direct expenses) are those costs which can be directly identified with a job, batch, product or service. The total of direct costs is known as prime costs.

All materials, labour and expenses costs which cannot be identified as direct costs are termed indirect costs. The three elements of indirect costs; indirect materials, indirect labour and indirect expenses are collectively known as overhead.

2-2

a) Variable Cost
b) Fixed Cost
c) Variable cost
d) Semi-variable
e) Semi-variable
f) Semi-variable

2-3

a) Direct materials
b) Direct materials
c) Indirect materials

2.2 THE FUNCTION OF DEPARTMENTS IN INDUSTRIAL ORGANISATIONS

Industrial organizations need the accounting information in order to make decisions. There is a close relationship between accounting department and manufacturing organization. This is because the accounting department records all the information relating to materials, labour and overhead which are that information will be used by the manufacturing organization in controlling and making decision.

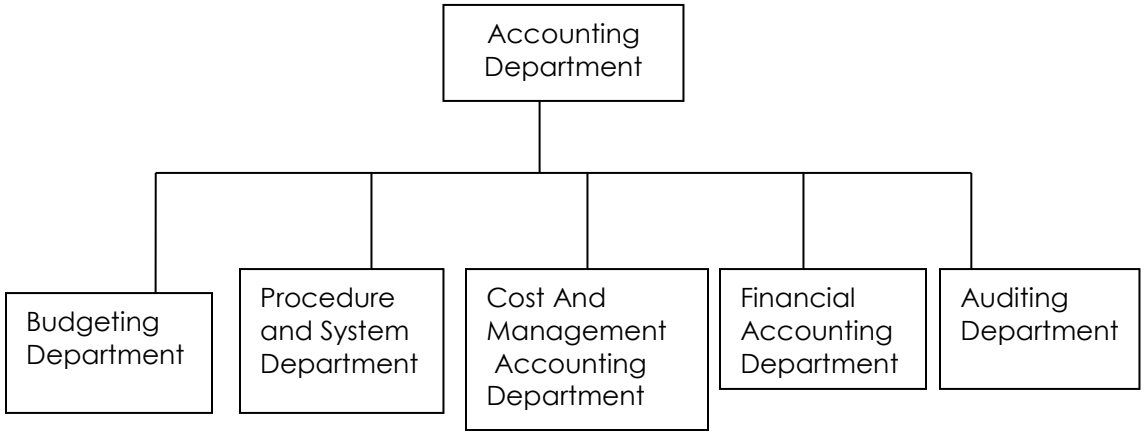


Figure 2.6 : The Accounting Department in manufacturing.

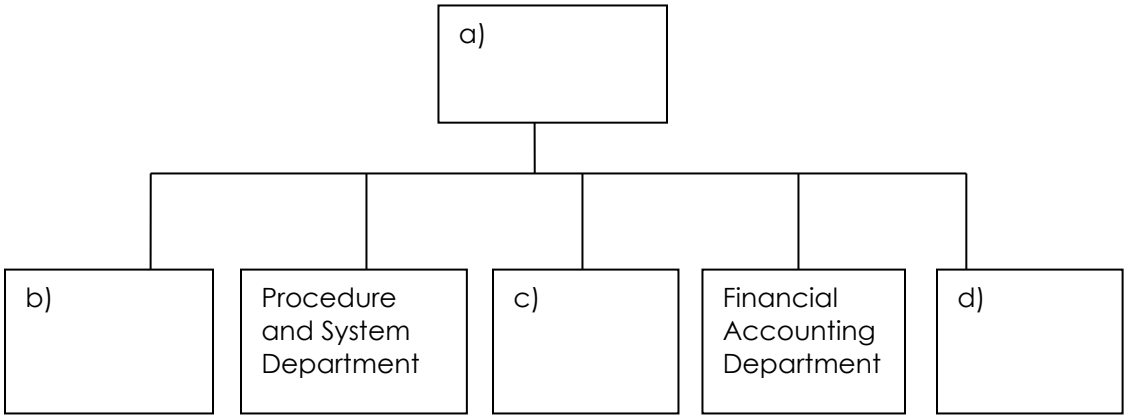
2.2.1 Relationship Between Departments And Cost Accounting Department

DEPARTMENTS	RELATONSHIP WITH COST ACCOUNTING DEPARTMENT.
Production Department – design and produce product	Production department will obtain the information from the cost accounting department since this department records all the details about materials, labour and overhead.
Personnel Department – responsible in labour efficiency, labour turnover, labour payment rate and bonus scheme.	Personnel department will also obtain the information regarding labour from cost accounting department because all of the details are kept by the cost accounting department
Marketing Department – fix a good price to attract customers.	Cost accounting department will analyse the product cost and at last will enable the sales price to be fixed to the certain product.
Sales Department – fix the product cost which can help the department to choose which product is more profitable.	The cost accounting department analyse the product cost. This enables the sales department to make decision in choosing which product is more profitable.

Table 2.1 :The Relationship between Cost Accounting Department and other department.

Activity

2-5 Complete the diagram with the correct answer.



2-6 State the relationship between factory organization and costing system

Feedback Activity

2-5 a) Accounting Department
b) Budgeting Department
c) Cost and Management Accounting Department
d) Auditing Department

2-6 The relationship between factory organization and costing system are:

a) Production department will obtain the information from the cost accounting department related to materials, labour and overhead.
b) Personnel department obtain the information regarding labour to accounting department.
c) Cost accounting department analyzed the product cost to fix the sales price.
d) The cost accounting analyzed the product cost in order to make decision.

SELF-ASSESSMENT

Question 2-1

From the information given below calculate the:

a) Prime costs

b) Production Cost

c) Total Production Costs

	RM
Production manager's salary	30 000
Wages and salaries of employee: (70% is direct labour)	100 000
Production royalties: $3 per unit	30 000
Haulage costs on raw materials bought	1 000
Carriage-inwards on raw materials	2 000
Hire of computers for production control	10 000
Depreciation : Plant and machinery	15 000
Depreciation: Factory building	20 000
Canteen costs (60% used by factory workers)	15 000
Interest on loan	1 000
Salesmen's salaries and commission	10 000
Travelling Expenses	2 000
Other factory indirect expenses	10 000
Salary of store clerks	5 000
Salary of costing clerks	8 000

Question 2-2

The following are the information extracted from ADAM Manufacturing for the year ended 31 December 2022.

	RM
Opening Stock: Raw materials	2 300
Finished goods	4 860
Work in progress	2 500
Purchased of raw materials	68 700
Direct wages	40 200
Indirect wages	8 900
Power and Electric	4 600
Insurance : Factory	1 556
Office	1 244
Rent : Factory	6 667
Office	5 333
Machine expenses	1 400
Factory general expenses	980
Depreciation: Plant and machinery	3 600
Office equipment	1 200
Sales and distribution expenses	6 800
Import duty on raw materials	1 000
Royalties	3 000

Additional information:

a) Closing Stock: Finished goods RM4, 450
Raw materials RM2, 880
Work in progress RM3, 000

b) Power and electric expenses are to be portioned to office and factory at the ratio of 2:3.

c) Accrual expenses: Sales and distribution expenses RM200
Direct wages RM150

You are required to prepare statement of cost for the ADAM Manufacturing .

Feedback Self-Assessment

2-1

a) RM10300

b) RM137000

c) RM240000

2-2

ADAM Manufacturing

Statement of Cost of Goods Manufactured

for the year ended 31 December 2022

Opening stock of raw materials	2 300
+ Purchased	68 700
+ Import Duty	1 000
	72 000
- Closing stock of raw materials	2 880
Cost of raw materials consumed	**69 120**
+ Royalty	3 000
+ Direct wages	40 350
Prime Cost	**112 470**
+ COSTS OVERHEAD:	
Indirect wages	8 900
Electric and power	2 760
Insurance	1 556
Rent	6 667
Machine expenses	1 400
Factory general expenses	980
Depreciation on plant and machinery	3 600
Manufacturing Cost	**138 333**
+ Opening work in progress	2 500
- Closing work in progress	3000
Cost of Goods Manufactured	**137 833**

+ Administration expenses:	
• Power and electric expenses	1 840
• Insurance	1 244
• Rent	5 333
• Depreciation on office equipment	1 200
Production Costs	**147 450**
+ Opening Stock of finished goods	4 860
- Closing Stock of finished goods	4 450
	147 860
+ Sales and distribution expenses	7 000
Cost of sales	**154 860**

EXERCISE

2-1

Below are the Information obtained from Kuntum Ltd., a company that procedures eco-friendly products as at 30 June 2022.

	RM
Plant and machinery	65,000
Purchases of raw materials	45,000
Return of purchases of raw materials	2,550
Carriage inwards	1,880
Manager salary	5,000
Rent	9,500
Factory insurance	1,500
Depreciation of plant and machinery	6,500
General office expenses	4,300
Direct wages	18,200
Royalty	800
Salesman's allowances	2,000
Advertising & promotional expenses	3,500
Stock of raw materials as at 1 July 2021	15,900
Stock of raw materials as at 30 June 2022	19,900

Additional information:

i. Work in process: 1 July 2021 - RM7,500
30 June 2022 - RM6, 500

ii. The manager spends 55% of his time at factory and 45% in the office.

iii. Rent is allocated using a 3:2 ratio for factory and office.

You are required to prepare a cost statement for Kuntum Ltd. as at 30 June 2022.

CHAPTER 3
MATERIALS AND STORES ORGANIZATION

OBJECTIVES

General Objective : To understand the importance of material control and store organization

Specific Objectives : At the end of the unit you will be able to

- List down the functions of the purchasing departments
- State and explain the purchasing and receiving procedures.
- State and explain the stock issuing procedures.
- Explain the importance of materials control and stores organization

3.0 INTRODUCTION

In this topic you will learn and understand the procedure of purchasing materials, the importance of controlling materials and how the store is organized.

3.1 MATERIALS

a) The term 'materials' is generally used in manufacturing and its refers to raw materials used for production. The terms ' materials' and 'store' are sometimes used inter changeably, while 'store' is wider in meaning than materials.

b) Materials costs constitute a **prime part of the total cost** of product of manufacturing firms. Therefore the control over materials purchases, consumptions and stocks are important for effective management of a business firm.

c) Materials control basically aims at the efficient purchasing of materials, the efficient storing and efficient consumption.

3.1.1 Materials Control

The following are the ***objectives*** in a good system of materials control:

a) Materials of the desired quality will be available when needed for efficient production.

b) Material will be purchased only when a need exists and in economic quantities.

c) The investment in materials will be maintained at the lowest level consistent with operating requirements.

d) Purchase of materials will be made at the most favorable prices under the best possible terms.

e) Materials are protected against loss or damage by fire, theft and handling with the help of proper physical controls.

f) Materials should be stored in such a way that they can provide minimum of handling cost and time.

3.2 THE FUNCTIONS OF PURCHASING DEPARTMENT

There are several functions of purchasing department:

a) The department should attempt to reduce the investment in stock to the lowest level consistent with operating requirements. This department determines what materials are required, how much is required and when they are required. The quantities should be bought in economic size so that there may not be over stocking.

b) The responsibility of the purchasing function includes price, quality and delivery all of which are crucial factors. Late or non-delivery, poor and substandard materials, incorrect specifications; are all likely to have at least as great an impact on profitability as paying an unnecessarily high price.

3.3 PURCHASING AND RECEIVING PROCEDURE

Purchasing procedures vary with different business firms. The important steps are as follows:

a) Purchase requisition

A form known as a purchase requisition is commonly used as a formal request to the purchasing department to order goods or services. There are **THREE (3)** general purposes of purchasing requisition:

1) It is the start of purchasing process and informs the purchasing department of the need for the purchase of material
2) It fixes the responsibility of the department making the purchase requisition.
3) It can be used for future reference.

The storekeeper prepares the purchase requisition. It contains details, such as number, date, department, quantity, description, specification, signature of the person initiating the requisition, and signature of one or more officers approving the purchase.

i) **Purchasing Order**

After the requisition is received and approved, the purchasing department places an order with a supplier. The order is placed through established suppliers. The purchasing department may ask for bids for quotation before placing the order. The objective is the secure the highest quality materials at the lowest price.

The purchase order should clearly state the materials required and the price, the delivery period and the department for whom the materials are purchased. Copies of the purchase order are sent to the department concerned, the sender of the purchase requisition and the store department. Copies of the purchase requisition and the purchase order are sent to the accounting department for the purpose of payment and voucher.

ii) **Receiving material**

The receiving department perform the function of unpacking materials which are received by an organization. The receiving department will count, check/ inspect the good received and compare the goods received with the description on the purchase order and make a record. The receiving report or material received report is prepared.

iii) **Approval of invoice**

Invoice approval is an important step in a materials control programme. It indicates that goods according to the purchase order have been received and payment.

iv) Making Payment

After the purchase invoice total is approved, the process of making payment begins. When it is found that items qualify for payment, a cheque is drawn for the amount and sent to the supplier.

3.4 ECONOMIC ORDER QUANTITY (EOQ)

Economic Order Quantity (EOQ) is the order that minimizes the total holding cost and ordering cost. Economic Order Quantity (EOQ) is also known as optimum re order quantity. EOQ is the most economical amount to place an order. The two most important categories of inventory cost are;

a) Ordering Cost - costs incurred on obtaining additional inventories, including cost incurred on communicating the order and transportation cost
b) Carrying Cost - represent the costs incurred on holding inventory in hand. In an accounting term that identifies all business expenses related to holding and storing unsold goods.

The following are the equation methods that can used to calculate EOQ.

$$EOQ = \sqrt{\frac{2CoD}{PCs}}$$

Where;

Co = Cost of placing and receiving per order
D = Total quantity demand (per annum or quantity of material required in a year)
P = Price
Cs = Carrying cost per unit

3.5 STOCK LEVEL

Stock level means the level of stock required for an efficient and effective control of goods, to avoid over-and under-stocking of goods. The need of inventory control is to maintain the stock of goods as low as possible but at the same time make them available as and when required.

The stock levels to be properly determined are:

a) The re-order level,

b) The minimum stock level and;

c) The maximum stock level.

d) Average stock level

3.5.1 Re-Order Level

This is the level, which it is essential to initiate purchase requisition for fresh supplies of materials. It is determined by:

a) The rate of consumption of materials

b) The time required to obtain new supplies(Re-order period)

Formula 3.1

Re-Order Level = Maximum Consumption X Maximum Re-Order Period

3.5.2 Minimum Stock Level

The minimum stock level is the level below which stocks should not normally be allowed to fall. It is determined by:

a) The rate of consumption of materials

b) Re-order period

Formula 3.2

Minimum Stock Level = Re-Order Level – { Normal @Average Consumption X Normal @ Average Re-Order Period)

3.5.3 Maximum Stock Level

Maximum stock level is the level which stocks should normally be allowed to rise. It is determined by:

a) The rate of consumption of materials
b) The re-order period
c) Amount of capital available
d) Cost of storage
e) Price fluctuation

Formula 3.3

Maximum Stock Level = Re-Order Level – (Minimum Consumption X Minimum Re-Order Period)

3.5.4 Average Stock Level

This can be determined by one of the two formula :

Formula 3.4

a) Average Stock Level = $\frac{[\text{Opening Stock} + \text{Closing Stock}]}{2}$; or

b) Average Stock Level = Minimum Level + $\frac{\text{Qty. ordered}}{2}$

3.5.5 Calculation Of Stock Levels

Example

Re-order quantity 2,000 units
Re-order period 3 to 5 weeks
Maximum consumption of materials 500 units per week
Minimum consumption of materials 300 units per week
Normal consumption of materials 400 units per week

Solution

Re-order level	=	500 x 5 = **2,500 units**
Minimum stock level	=	2,500 – 400 x 4 = **900 units**
Maximum stock level	=	2,500 – (300 x 3) + 2,000 = **3,600 unit**

Formula 3.5

$$EOQ = \sqrt{\frac{2DCo}{PCs}}$$

D	=	Demand for units of materials per annum
Co	=	Cost of ordering
P	=	Price
Cs	=	Cost of storage of materials
Q	=	Re-order quantity

Example

The demand for materials Orked is 12,000 units per annum. The cost of storage is 24 % per annum. The cost of ordering is RM2.00 per order . The price of Orked is RM5 per unit.

$$EOQ = \sqrt{\frac{2 \times 12{,}000 \times RM2}{RM5 \times 0.24}}$$

$$= \sqrt{\frac{48{,}000}{1.20}}$$

$$= \mathbf{\underline{200\ units}}$$

In respect of materials Orked, the following data are available:

Lead-time from suppliers is estimated a maximum 4 months and minimum 2 months. The average lead-time is 3 months.

Budgeted consumption: Maximum 300 unit /month
Minimum 50 unit/month
Annualy 1,800 units

Cost of storage is 25% per annum. Ordering cost is RM2.00 per order

Price per unit of materials is RM0.32.

Calculate EOQ and all the stock level

Solution

a) Economic Order Quantity

$$EOQ = \sqrt{\frac{2DCo}{PCs}}$$

$$= \sqrt{\frac{2 \times 1{,}800 \times 2}{0.32 \times 0.25}}$$

$$= \sqrt{\frac{7{,}200}{0.08}}$$

$$= \sqrt{90{,}000}$$

$$EOQ = \mathbf{300\ units.}$$

b) Re-order level

= Max. C X Max RP

= 300 X 4

= **1,200 units**

c) Minimum stock level

= RL - (NC X NRP)

= 1,200 - (150 X 3)

= **750 units**

d) Maximum stock level

= RL - (Min. C X Min. RP) + RQ

= 1,200 - (50 X 2) + 300

= **1,400**

e) Average stock level

i) $\frac{\text{Min. SL + Max. SL}}{2}$

or

ii) $\text{Min. SL} + \frac{\text{RQ}}{2}$

$= 750 + \frac{300}{2}$

= **900 units**

iii) Stock turnover

$= \frac{\text{Annual consumption}}{\text{Average stock level}}$

$= \frac{1800}{900}$

= 2 times p.a.

3.6 RATE OF STOCK TURNOVER

The stock turnover rates measures the number of times the average stock is used up during a certain period. It is a good technique to be used in the control of materials costs.

Formula 3.6

$$\text{Rate of stock turnover} = \frac{\text{Cost of materials used during a period}}{\text{Average stock of material used during the period}}$$

Example

Cost of materials Puspawangi used in the year	=	RM200,000.
Opening stock of materials XYZ	=	RM50,000.
Closing stock of materials	=	RM30,000.

Solution to Example

$$\text{Average stock} = \frac{50{,}000 + 30{,}000}{2}$$

$$= \mathbf{40{,}000}$$

$$\text{Stock Turnover Rate} = 200{,}000/40{,}000$$

$$= \mathbf{5\ times}$$

This means that stock is turned over five times a year or once in every 73 days [365 days /5]

Activity

3-1 A good system of materials control is very important to the manufacturing firm. Give **FIVE (5)** objectives of a good system of material control.

1. _____

2. _____

3. _____

4. _____

5. _____

3-2 What are the functions of the purchasing department? Explain briefly the procedure of purchasing material.

3-3 The data below is extracted from Senandung Manufacturing Com. at 31 December 2022.

Price of materials	RM5.00 per liter
Cost of ordering	RMRM100 per order
Carrying cost	20% per annum
Normal consumption	500 liters per week
Minimum consumption	250 liter per week
Maximum consumption	750 liter per week
Lead time period	4 to 6 weeks

Assume that the company works 48 weeks a year.
You are required to calculate:

a) Economic Order Quantity
b) Re-order level
c) Minimum Stock level
d) Maximum Stock level
e) Average Stock level

Feedback Activity

3-1 The following are the **objectives** of a good system of materials control:

1. Materials of the desired quality will be available when needed for efficient production.
2. Material will be purchased only when a need exists and in economic quantities.
3. The investment in materials will be maintained at the lowest level consistent with operating requirements.
4. Purchase of materials will be made at the most favorable prices under the best possible terms.
5. Materials are protected against loss or damage by fire, theft, handling with the help of proper physical controls.

3-2 The functions of the purchasing department are:

To reduce the investment in stock to the lowest level consistent with operating requirements. This department determines what materials are required, how much is required and when materials are required. The quantities should be bought in economic size so that there may not be over stocking.

In other word, the department should be able to place an order at the right time from the right source to the right quantity at the right price and quality.

3-3 The important steps are as follows:

- Purchase requisition
- Purchase order
- Receiving material
- Approval of invoices
- Making payments

3-4 a) Economic Order Quantity

$$EOQ = \sqrt{\frac{2DCo}{PCs}}$$

$$= \sqrt{\frac{2 \times 500 \times 48 \times 100}{0.2 \times RM5.00}}$$

= **2,191 liter**

b) Re-order level

= Max. C X Max RP

= 750 x 6

= **4,500 liter**

c) Minimum Stock level

= RL - (NC X NRP)

= 4,500 - (500 X 5)

= **2,000 liter**

d) Maximum Stock level

= RL - (Min. C X Min. RP) + EOQ

= 4,500 - (250 x 4) + 2,191

= **5,691 liter**

e) Average Stock level

$$= \frac{\text{Min. SL} + \text{Max. SL}}{2}$$

$$= \frac{2{,}000 + 5{,}691}{2}$$

= **3,846 liter**

SELF-ASSESSMENT

Question 3-1

Using the data given below, you are required to calculate:

a) EOQ
b) Re-order Level
c) Maximum Stock level
d) Minimum Stock level
e) Average Stock level

Cost of materials RM10.00 per unit
Materials consumption 100 unit per day
Minimum re order period 20 days
Maximum re order period 30 days
Storage Cost 10% per year

(It is assumed that there are 48 weeks in a year and five working days a week)

Question 3-2

Using the information below calculate the Re-order level, minimum and maximum level.

Average usage	100units per day
Minimum usage	60 units per day
Maximum usage	130 units per day
Lead time	20-26 days
EOQ	4,000 units

Question 3-3

What are the Economic Order Quantity when demand is 25 per working day, ordering costs are RM150 per order, the item costsRM3 each and carrying costs is 12 % per annum. There are 250 working days in a year.

Feedback Self-Assessment

3-1 a) Economic Order Quantity (EOQ)

$$= \sqrt{\frac{2DCo}{PCs}}$$

$$= \sqrt{\frac{2 \times (100 \times 48x5) \times 400}{10 \times 0.1}}$$

= **4381 unit**

b) Re-order level

= Max. C X Max RP

= 100 x 30

= **3,000 unit**

c) Minimum Stock level

= RL - (NC X NRP)

= 3,000 - (50 X 25

= **1,750**

d) Maximum Stock level

= RL - (Min. C X Min. RP) + EOQ

= 3,000 - (100 x 20) + 4381

= **5,381 unit**

e) Average Stock level

$$= \frac{\text{Min. SL} + \text{Max. SL}}{2}$$

$$= \frac{1{,}750 + 5{,}381}{2}$$

= **3,566 units**

3-2 Re-order level = Maximum usage x maximum lead time

= 130 x 26

= **3,380 units**

Minimum level **=** Re order level – average usage in average lead time

= 3,380 – (100 x 23)

= 3,380 – 2,300

= **1,080 units**

Maximum level = Re order level + EOQ – minimum anticipated usage in minimum lead time

= 3,380 +4,000 – (60 x 20)

= **6,180 units**

3-3 Demand per annum= 25 x 250 = 6,250

EOQ = $\sqrt{\frac{2DCo}{PCs}}$

= $\sqrt{\frac{2 \times 150 \times 6\,250}{3 \times 0.12}}$

= 2,282 units

EXERCISE

Question 1

The data below is extracted from Melati Manufacturing Com. at 31 December 2022

Price of materials	RM5.00 per liter
Cost of ordering	RM100 per order
Carrying cost	20% per annum
Normal consumption	500 liters per week
Minimum consumption	250 litter per week
Maximum consumption	750 litter per week
Lead time period	4 to 6 weeks

Assume that the company works 48 weeks a year. You are required to calculate:

a) EOQ
b) Re-order level
c) Minimum Stock Level
d) Maximum Stock Level
e) Average Stock Level

Question 2

Using the data given below, you are required to calculate

a) EOQ
b) Re-order level
c) Minimum Stock Level
d) Maximum Stock Level
e) Average Stock Level

Cost of materials RM 10.00 per unit
Materials of consumption 100 unit per day
Minimum re order period 20 days
Maximum re order period 30 days
Storage cost 10% per year

Assume that there are 48 weeks in a year and five working days a week

Question 3

Using the information below calculate the re-order level, minimum and maximum level

Average usage	100 units per day
Minimum usage	60 unit per day
Maximum usage	130 unit per day
Lead time	20 – 26 days
EOQ	4 000 units

Question 4

What are the EOQ when demand is 25 per working day, ordering cost are RM150 per order, the item costs RM3 each and carrying costs is 12% per annum. There are 250 working days in a year.

Question 5

Using the data given below, you are required to calculate

a) EOQ

Price of materials	RM0.32
Cost of ordering	RM2 per order
Carrying cost	25% per annum

Demand for units of material per annum 1 800 unit per year

Question 6

Using the data given below, you are required to calculate

a) EOQ

b) Re-order level

c) Minimum Stock Level

d) Maximum Stock Level

e) Average Stock Level

Re order period (weeks)	2 – 4
Consumption of materials (units)	100 – 400
Cost of item per unit (RM)	10
Cost per order (RM)	20
Storage cost (measured in term of average stock value)	15%
Quantity required for the year (units)	3 000

CHAPTER 4
MATERIALS AND STORES ORGANISATION
STOCK EVALUATION

OBJECTIVES

General Objective: To apply the methods of stock evaluation and also to know the advantages and disadvantages of each method of stock evaluation.

Specific Objectives: At the end of the unit you will be able to:

- Calculate the cost of materials issued and the value of the closing stock using the methods of FIFO, LIFO and Weighted Average Cost.
- To record the accounting for materials
- To list down and explain the advantages and the disadvantages of the method of stock evaluation.

4.0 METHODS OF STOCK EVALUATION

There are several methods of pricing the issue of materials. Each methods will give different results, hence effecting profit as well as the value of closing stocks in the balance sheet.

4.1 FIRST IN FIRST OUT (FIFO)

The FIFO method follows the principle that materials received first are issued first. After the first lot or batch of materials purchased is finished, the next lot is taken up for supply.

The **advantages** of FIFO method are:

a) The inventories consist of the latest batch (purchases)
b) Management has little control over the selection over the selection of units in order to influence recorded profits
c) Valuation of inventories and cost of goods manufactured are consistent and realistic
d) Easy to understand and operate

The **disadvantages** of this method are:

a) The objective of matching current cost with current revenue is not achieved under this method:

   i) FIFO costing is improper if many lots are purchased during the period at different prices
   ii) This method overstates profits especially with high inflation

Example 4.1:

The following is summary of the receipts and issue of materials in factory during October 2022.

Date	Purchase		Sales
	Units	RM/units	Units
Oct 1	1000	1.00	
Oct 5	260	1.05	
Oct 6			700
Oct 12	400	1.15	
Oct 20	300	1.25	
Oct 24			620
Oct 25			240

Solution to Example 4.1

FIFO method

Date	Purchase			Sales			Balance		
	Q	P	A	Q	P	A	Q	P	A
Oct 1	1000	1.00	1000				1000		1000
Oct 5	260	1.05	273				1260		1273
Oct 6				700	1.00	700	560		573
Oct 12	400	1.15	460				960		1033
Oct 20	300	5.50	375				1260		1408
Oct 24				300	1.00	300			
				260	1.05	273			
				60	1.15	69			
				620		642	640		766
Oct 25				240	1.25	276	***400***		***490***

4.2 LAST IN FIRST OUT (LIFO)

The materials purchased are issued in the reverse order to FIFO; that is the last receipt is the first issue. The inventory is priced at the oldest costs.

The **advantages** of the LIFO method are:

a) It provides a better matching of current costs with current revenue.
b) It resulted in a real income in times of rising prices, by maintaining net income at a lower level
c) This method considered as a cheap form of tax avoidance by business firms.
d) LIFO produces an income statement, which shows correct profit or losses and financial position.

The **disadvantage** of LIFO costing method is:

a) The valuation of inventory for balance sheet purposes is out of date, as it reflects prices of some past period

Example 4.2

The following is summary of the receipts and issue of materials in factory during October 2022.

Date	Purchase		Sales
	Units	RM/units	Units
Oct 1	1000	1.00	
Oct 5	260	1.05	
Oct 6			700
Oct 12	400	1.15	
Oct 20	300	1.25	
Oct 24			620
Oct 25			240

Solution to Example 4.2:

LIFO method

Date	Purchase			Sales			Balance		
	Q	P	A	Q	P	A	Q	P	A
Oct 1	1000	1.00	1000				1000		1000
Oct 5	260	1.05	273				1260		1273
Oct 6				260	1.05	273			
				440	1.00	440			
				700		713	560		560
Oct 12	400	1.15	460				960		1020
Oct 20	300	1.25	375				1260		1395
Oct 24				300	1.25	375			
				320	1.15	368			
				620		743	640		652
Oct 25				80	1.15	92			
				160	1.00	160			
				240		252	***400***		***400***

4.3 WEIGHTED AVERAGE COST (WAC)

Under this method, issue of material is priced at the average cost price of the materials in hand a new average being computed whenever materials are received. In this method, total quantity and total costs are considered in computing the average price and not the total of rates divided by total number of rates as in calculated each time a purchase is made.

The advantages of WAC

a) The method is logical and consistent as it absorbs while determining the average for pricing material issues.
b) The changes in the prices of materials do not affect much the materials issues and stock
c) The method follows the concept of total stock and total valuation.

The disadvantages of WAC

a) Simplicity and convenience are lost when there is too much change in the prices of materials
b) An average price is not based on actual price incurred; therefore is not realistic.

Example 4.3 (WAC method)

The following is summary of the receipts and issue of materials in factory during October 2022.

Date	Purchase		Sales
	Units	RM/units	Units
Oct 1	500	20	
Oct 10	300	24	
Oct 15			700
Oct 20	400	28	
Oct 25			300
Oct 27	500	22	
Oct 31			200

Solution to Example 4.3:

Date	Purchase			Sales			Balance		
	Q	P	A	Q	P	A	Q	P	A
Oct 1	500	20	10,000				500	20	10000
Oct 10	300	24	7,200				800	21.50	17200
Oct 15				700	21.50	15,050	100		2150
Oct 20	400	28	11200				500	26.70	13350
Oct 25				300	26.70	8010	200		5340
Oct 27	500	22	11000				700	23.34	16340
Oct 31				200	23.34	4668	500		11672

Activity

4-1 The following transactions occur in the purchase and issue of a material:

Date	Purchase		Sales
	Units	RM/units	Units
Jan 29	100	5.00	
Feb 4	25	5.25	
Feb 12	50	5.50	
Feb 14			80
Mar 8	50	5.50	
Mar 20			80
Mar 27	50	5.75	

a) From the data given below calculate the value of the closing stock using:

i) the First In First Out (FIFO) method

ii) the Last In First Out (LIFO) method

4-2 Show the stores ledger entries, as they would appear when using:

a) the weighted average cost

b) the LIFO method of pricing issues, in connection with the following transaction:

Date	Purchase		Sales
	Units	RM/units	Units
Apr 2	200	2.00	
Apr 4			150
Apr 6	200	2.30	
Apr 11			150
Apr 19			200
Apr 22	200	2.40	
Apr 27			150

April 1, opening stock is 300 units at a price of RM2.00 per unit

Feedback To Activity

4-1

a) FIFO method

Date	Purchase			Sales			Balance		
	Q	P	A	Q	P	A	Q	P	A
Jan 29	100	5.00	500				100		500
Feb 4	25	5.25	131.25				125		631.25
Feb 12	50	5.50	275				175		906.25
Feb 14				80	5	400	95		506.25
Mar 8	50	5.50	275				145		781
Mar 20				20	5	100			
				25	5.25	131.25			
				35	5.50	192.50			
				80		423.65	65		357.25
Mar 27	50	5.75	287.50				***115***		***644.75***

i) The value of closing stock is RM644.75 under FIFO method

b) LIFO method

Date	Purchase			Sales			Balance		
	Q	P	A	Q	P	A	Q	P	A
Jan 29	100	5.00	500				100		500
Feb 4	25	5.25	131.25				125		631.25
Feb 12	50	5.50	275				175		906.25
Feb 14				50	5.50	275			
				25	5.25	131.25			
				5	5	25			
				80		431.25	95		475
Mar 8	50	5.50	275				145		750
Mar.20				50	5.50	275			
				30	5.00	150			
				80		425	65		325
Mar.27	50	5.75	287.50				***115***		***612.50***

ii) The value of closing stock is RM612.50 under LIFO method.

4.2

a) Weighted Average Cost

Date	Purchase			Sales			Balance		
Apr 1							300	2	600
Apr 2	200	2.20	440				500	2.08	1040
Apr 4				150	2.08	312	350	2.08	728
Apr 6	200	2.3	460				550	2.16	1188
Apr 11				150	2.16	324	400	2.16	864
Apr 19				200	2.16	432	200		432
Apr 22	200	2.4	480				400	2.28	912
Apr 27				150	2.28	342	***250***	***2.28***	***570***

Closing stock is RM570 under this method.

b) LIFO method

Date	Purchase			Sales			Balance		
Apr 1							300	2	600
Apr 2	200	2.20	440				500	2.08	1040
Apr 4				150	2.2	330	350		710
Apr 6	200	2.3	460				550		1170
Apr 11				150	2.3	345	400		825
Apr 19				50	2.3	115			
				50	2.2	110			
				100	2	200			
				200		425	200		400
Apr 22	200	2.4	480				400		880
Apr 27				150	2.4	360	***250***		***520***

Closing stock is RM520 under this method.

Self-Assessment

Question 4-1

You are required to record the following transaction in the store ledger card using:

a) FIFO method

b) LIFO method

c) Weighted Average Cost Method

Date	Purchase		Sales
	Units	RM/units	Units
Jan 4	200	11.00	
Jan 5	100	12.00	
Jan 7			50
Jan 9			250
Jan 14	200	14.00	
Jan 31			100

On the third of January, opening stock b/d is 100 units, RM10 per unit.

Question 4-2

State the advantages and the disadvantages of FIFO method.

Feedback To Self-Assessment

4-1. **a) FIFO Method**

Date	Purchase			Sales			Balance		
Jan 3							100	10	1000
Jan 4	200	11	2200				300		3200
Jan 5	100	12	1200				400		4400
Jan 7									
				50	10	500	350		3900
Jan 9				50	10	500			
				200	11	2200			
				250		2700	100		1200
Jan 14	200	2800					300		4000
Jan 31				100	12	1200	***200***		***2800***

Closing stock under FIFO method is RM2, 800

b) LIFO method

Date	Purchase			Sales			Balance		
Jan 3							100	10	1000
Jan 4	200	11	2200				300		3200
Jan 5	100	12	1200				400		4400
Jan 7									
				50	12	600	350		3800
Jan 9				50	12	600			
				200	11	2200			
				250		2800	100		1000
Jan 14	200	2800					300		3800
Jan 31				100	14	1400	***200***		***2400***

Closing stock under FIFO method is RM2, 400

c) Weighted Average Cost

Date	Purchase			Sales			Balance		
Jan 3							100	10	1000
Jan 4	200	11	2200				300		3200
Jan 5	100	12	1200				400	11	4400
Jan 7									
				50	11	550	350	11	3850
Jan 9				250	11	2750	100		1100
Jan 14	200	2800					300	13	3900
Jan 31				100	13	1300	***200***	***13***	***2400***

4-2. i) The ***advantages*** of FIFO method are**:**

a) The inventories consist of the latest batch (purchases)
b) Management has little control over the selection over the selection of units in order to influence recorded profits
c) Valuation of inventories and cost of goods manufactured are consistent and realistic
d) Easy to understand and operate

ii) The ***disadvantages*** of this method are:

a) The objective of matching current cost with current revenue is not achieved under this method
b) FIFO costing is improper if many lots are purchased during the period at different prices
c) This method overstates profits especially with high inflation.

EXERCISE

QUESTION 1

The stock flow below is shown in Adam's stock card for the month of April 2022

Date	Purchase		Sales
	Units	RM/units	Units
2 Apr	10	10.00	
10 Apr			6
11 Apr	20	15.00	
20 Apr	30	11.00	
22 Apr			44
25 Apr	20	14.50	
29 Apr			15

Selling price is RM26 per unit. By using the First in First out (FIFO) and Weighted Average Cost method, calculate the ending stock value

QUESTION 2

Below are the data of inventories for Hawa Sdn Bhd in September 2022..

Date	Purchase		Sales
	Units	RM/units	Units
2 Sept	150	46.00	
6 Sept			90
10 Sept	120	47.00	
14 Sept			150
20 Sept	140	48.00	
22 Sept			180
23 Sept	80	49.00	
24 Sept			120

The stock balance on 1 September 2022 is 100 units @ RM45 each. Hawa Sdn Bhd uses First In First Out (FIFO) method.

You are required to:

a) Identify the ending inventory value

b) Calculate the following terms

   i. Units of ending inventory

   ii. Ending inventory value

   iii. Cost of goods sold

QUESTION 3

Instatopia Company has the following inventory, purchases and sales data for the month of April 2022.

Inventories: April 1 200 units @RM4.00

Purchases:

10	500 units @ RM4.50
20	400 units @ RM4.75
30	300 units @ RM5.00

Sales:

15	500 units
25	400 units

The physical inventory count on April 30 shows 500 units of inventory in hand.

You are required to:

a) Identify the cost of inventory in hand as at 30 April and the cost of goods sold for April under the first-in first-out (FIFO) method.

b) Prepare the cost of inventory in hand as at 30 April and the cost of goods sold for April under Weighted the average cost (AVCO) method.

QUESTION 4

The information below shows the data of inventories of Azalea Sdn Bhd

Date	Purchase		Sales
	Units	RM/units	Units
1 May	24	34.00	
4 May	13	35.00	90
10 May			15 @ RM80
15 May	16	36.00	
18 May			10 @ RM81
22 May	20	37.00	
28 May			15 @ RM80
30 May			18 @ RM81

You are required to complete the closing inventories and cost of goods sold of the company as at 31 May 2022 using ;

a. FIFO
b. LIFO and,
c. calculate Gross Profit

CHAPTER 5
LABOUR AND WAGE ANALYSIS

OBJECTIVES

General Objective : To understand the importance of labour force and labour costs control in a business.

Specific Objectives : At the end of the unit you will be able to:

- Explain the procedure of employment and retirement
- State the causes of employees leaving the company
- Calculate the labour turnover rate
- Explain the method of recording labour time.

5.0 INTRODUCTION

A proper control and accounting for labour costs is one of the most important objective of all business firms. For a manufacturing business firm engaged in producing a specific product , labour costs are accumulated and charge to the product as they are produced. But before we go any further, in calculating the labour costs we will first look at the process of employment and retirement of the labour.

5.1 THE ENGAGEMENT OF LABOUR

The engagement of labour is delegated by the management to the personnel officer. The personnel officer carries out this work in response to a properly authorized request for employees received from departmental manager.

The procedure upon engagement of labour is as follows:

a) Notice is given to the department concerned. When the employee reports for duty he sees the personnel officer and is given a copy of the work rules.

b) Notice is given to the wages office. This notifies them of the new employee's name, the date of commencement, department, rate of pay and clock number.

5.2 TERMINATION OF EMPLOYMENT

When an employee leaves his employment for any reason, the personnel officer should seek to find out that reason. The employee should give a prior notice for resignation.

5.3 LABOUR TURNOVER RATE

Any changing of employees occasions loss to a manufacturer. Labour turnover is the rate at which employees leave employment at a factory. Labour turnover can be calculated as below as :

$$\frac{\text{The average of employees leaving + replace for the year}}{\text{The average number of employees for the year}} \times 100$$

Example 5.1

This information is extracted from Cantek Company relating its employees for the year ended 2022:
The number of employee employed on 1.1. 2022 is 120. During the year, 24 new employees were employed and 18 left.
You are required to calculate:

a) The number of employees on 31.12. 2022
b) Labour turnover rate

Solution to Example 5.1

a) The number of employees on 31.12.2022

No. of employees at 1.1.2022	120
+ New employees	24
- Employees left	18
	126

b) Labour turnover rate = $\frac{(24 + 18)/2}{(120 + 126)/2} \times 100\%$

= **17.07%**

5.4 CAUSES OF LABOUR TURNOVER

Avoidable Causes

Below are some of the examples of avoidable causes:

a) Low wages and earning
b) Unsatisfactory working conditions
c) Bad relations among workers and supervisors
d) Unsuitable of job

Unavoidable Causes

a) Termination of service due to misbehavior or indiscipline
b) Retrenchment or lay off due to shortage of resources.

Example

1. Melur Company produced the detail about labour turnover for its employees.

	Department X	**Department Y**
No. of employee at the beginning of the period	72	34
The addition of employee during the period	14	9
No. of employees leaving during the period	11	7

You are required to calculate:

a) The number of employee at the end of the period
b) Labour turnover rate for each department

a. The number of employee at the end of the period

Department X = 72 + 14 – 11 = **75**

Department Y = 34 + 9 – 7 = **36**

b. LTR = The average of employees leaving + replace for the year X 100

The average number of employees for the year

Department X

LTR = $\frac{(11 + 14)/2}{(72 + 75)/2} \times 100$

= $\frac{12.5}{73.5} \times 100$

= **17%**

Department Y

LTR = $\frac{(7 + 9)/2}{(34 + 36)/2} \times 100$

= $\frac{8}{35} \times 100$

= 22.9%

5.5 THE METHODS OF REMUNERATION

An important aspect of labour cost control is a wage system designed primarily for exercising management control over employees. Basically, there are **two main schemes of payment for employees:**

a) Payment on the basis of time attendance (time basis)

b) Payment by results (piecework)

TIME AS A BASIS FOR REMUNERATION (STRAIGHT TIME)

Under the time basis the worker is paid at an hourly, daily or weekly rate and his remuneration depends upon the time for which he is employed and not upon his production.

Wage are calculated using the following formula:

WAGES = HOUR ATTENDED X RATE OF PAY PER HOUR

If an employee is paid for 8 hours attendance time at a wage rate of RM 4 per hour and his job ticket shows that he had worked a total of 7 ½ hour on Job No 123, the ½ hour which he is paid is termed idle time. Since this idle time is not productive, it is to be charged to production overhead.

Direct labour – 7 ½ hrs x RM4	= RM30.00
Indirect labour to product overhed – ½ hr x RM4.00	= 2.00
Total wage	**= RM32.00**

When an employee is required to work overtime, he is normally paid a premium rate. If he is paid **time-and-a-half**, the will receive **one and half times** his basic wage rate.

Example

Hassan works an 8-hour day at a basic wage rate of RM 4.00. On a particular day, he worked **10 hours**. If overtime is paid at **time-and-a-half**, calculate his basic wage and the overtime premium.

Solution to Example:

Basic wage	= 10 hrs x RM4.00	= RM40
Overtime premium	= 2 hrs x RM4.00 x ½	= 4
Total wage		= **RM44**

The answer may also be worked out in the following manner:

Ordinary wage	= 8 hrs x RM4.00	= RM32
Overtime wage	= 2 hrs x RM4 x 1 ½	= 12
Total wage		= **RM44**

PAYMENT BY RESULTS – AN INCENTIVE SCHEME

Paying wages on a time basis does not provide any incentive to employees to work more efficiency. There are many possible types of incentive schemes which can be devised. They are as follows:

1) Piecework Scheme
2) Individual Bonus For Efficiency Standards
3) Group Bonus For Exceeding Production Targets
4) Profit-Sharing Scheme

1) Piecework Scheme

In a piecework scheme, wage are calculated using the formula:

Wage = Unit Produced x Rate of Payment per unit

The piecework system is mostly used for direct workers. A fixed rate is paid for each unit produced. The worker's wages depends upon his output and not upon the time he spends in the factory.

Suppose an employee is paid RM1.00 for each unit produced and works a 40-hour week and production overhead is added at the rate of RM2.00 per direct hour.

Weekly Production Units	Pay (RM)	Overhead (40 hrs) RM
40	40	80
50	50	80

Individual Bonus Scheme

These scheme are :

a) Halsey

b) Halsey Weir

c) Rowan

a) Halsey Bonus Scheme

Under this scheme an employee is paid a basic rate per hour. If he completes his work in less than the 'standard or expected time', he earns a bonus.

The bonus = ½ x time saved x basic day rate

Example :

Kesuma is paid RM2.00 per hour for an 8-hour day. In one day, he completes his job with standard times of 12 hours. Calculate his wages.

Standard time	12hrs.
Actual time	8hrs.
Time saved	**4hrs**

Bonus (1/2 x 4hrs. x RM2.00)=	RM 4	
Basic pay (8 hrs. x RM2.00)	=	RM16
Gross wage	**=**	**RM20**

a) Halsey-Weir Bonus Scheme

The bonus = 1/3 x time saved x basic day rate

Example

Encik Kamil is paid RM1 per hour. Time allowed is 50 hours. The time taken by him is 40 hours. Calculate his basic pay, bonus and his gross wage.

Solution to Example;

Time saved = Time allowed – Time Taken
= 50 hrs. - 40 hrs.
= 10 hrs.

Bonus = 1/3 x 10 hrs. x RM1.00
= RM3.33

Basic pay = 40 hrs. x RM1.00
= RM40.00

Gross Wage = RM40.00 + RM3.33
= **RM43.33**

b) Rowan Bonus Scheme

Under this scheme the bonus is calculated as follows:

$$\text{Bonus} = \frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time Saved} \times \text{Day rate}$$

Example ;

Kemboja is paid RM2.40 per hour and is given a job which has a standard time allowed of 12 hours What should be her bonus pay for the job , and total rate of pay per hour if the job takes 9 hours.

Solution to Example:

Time saved = Time allowed – Time Taken
= 12hrs. - 9hrs.
= 3 hrs.

Bonus = 9/12 x 3hrs. x RM2.40 = RM5.40
Basic pay = 9 hrs x RM2.40 = RM21.60
Total pay = **RM27.00**

In a payment by results scheme, employees are paid a bonus on hours saved, at the basic wage rates. The bonus hours gained are calculated on the hours save multiplied by the ratio of time saved to time allowed. Jobs are carried forward from one week to another and no overtime required. Payment is made in full for total units produced. Details are as follows:

	Employee		
	C	D	E
Units issued to worker (dozens)	40	65	35
Time allowed (hours)	108	125	75
Basic wage rate per hour	RM1.40	RM1.00	RM1.60
Time taken (hours)	72	75	80
Rejects (units)	32	68	20

Your are required to calculate for each employee:

a) bonus hours and bonus earned;

b) gross wages earned;

	Employee		
	C	D	E
Time allowed (hours)	108	125	75
Time taken (hours)	72	75	80
Time saved (hours)	36	50	-

a) Bonus hours:

C : 72/108 x 36 = 24

D : 75/125 x 50 = 30

E : none.

Bonus earned:

C : 24 hours @ RM1.40 = **RM33.60**

D : 30 hours @ RM1 = **RM30**

E: none

b) Gross wages earned: C : (72 + 24) hours @ RM1.40 = **RM134.40**
D : (75 + 30) hours @ RM1.00 = **RM95.00**
E : 80 hours @ RM1.60 = **RM128.00**

5.6 COST OF LABOUR TURNOVER

The cost of labour turnover consists of two elements:

a) Preventive costs
b) Replacement costs

5.6.1 Preventive Costs

Preventive costs include all those costs which are incurred to prevent workers from leaving the organization and keeping them satisfied. These are the examples of preventive costs:

a) A personnel department incurs costs on recruitment, selection, training and other things related to employment
b) The cost incurred for providing medical benefits to the worker.
c) Welfare include facilities like sports, transport, canteen and housing. These facilities will prevent workers from leaving.

5.6.2 Replacement Costs

Replacement costs include the costs which are incurred for the recruitment and training of new workers. Also, they cover costs which arise as a result of wastage, losses, lower production because of less competent and inexperienced new employees. Replacement costs consider the following factors:

a) The increase in costs of the personnel department due to the recruitment of new workers.

b) The lost of production time as the new workers need to be given training.

c) The inefficiency of new workers and will affect production

d) Costs of breakages of tools and equipment due to inexperienced workers

Activity

5-1 What is labour turnover? How will you measure it?

5-2 Explain briefly four avoidable causes of labour turnover.

5-3 State five actions that have to be taken by the company in order to prevent employees from leaving.

5-4 R & N Company produced the detail about labour turnover for its employees.

	Department X	**Department Y**
No. of employee at the beginning of the period	72	34
The addition of employee during the period	14	9
No. of employees leaving during the period	11	7

You are required to calculate:

c) The number of employee at the end of the period

d) Labour turnover rate for each department

Feedback To Activity

5-1 Labour turnover is the rate at which employees leave employment at a factory. This is a formula of measuring of labour turnover:

$$\frac{\text{The average of employees leaving + replace for the year}}{\text{The average number of employees for the year}} \times 100$$

5-2 The avoidable causes are as the following:

a) Low wages and earning
b) Unsatisfactory working conditions
c) Bad relations among workers and supervisors
d) Unsuitable of job

5-3 Preventive costs include all those costs which are incurred to prevent workers from leaving the organization and keeping them satisfied. These are the examples of preventive costs:

a) A personnel department incurs costs on recruitment, selection, training and other things related to employment
b) The cost incurred for providing medical benefits to the worker.
c) Welfare includes facilities like sports, transport, canteen and housing. These facilities act as buffers in order to prevent workers from leaving.

5-4 The number of employee at the end of the period

Department X = 72 + 14 – 11
= **75**

Department Y = 34 + 9 – 7
= **36**

b)

	Department X	**Department Y**
The average number of employee leaving and replaced	(14 + 11)/2 = 125	(9+7)/2 = 8
The average number employed	(72 + 75)/2 = 73.5	(34+36)/2 = 35
The labour turnover rate	12.5/73.5 x 100 = 17%	8/35 x 100 = 22.9%

EXERCISE

QUESTION 1

Production Department of Syarikat AimanAdam have THREE (3) employee

Following production's information is related by three employee of June 2022.

	FIKRI	FARID	FAHIM
Unit Produced	250	180	240
Time allowed per unit (minutes)	12	11.5	10
Time Taken (hour)	28	25	30
Hourly rate of pay (RM)	2.50	3.00	3.50
Product rate of pay per unit (RM)	0.50	0.60	0.70
Cost per unit (RM)	1.50	1.75	1.80

You are required :

a) Calculate total of wages for each employee based on;

i. Halsey-Schemes

ii. Halsey-Weir Schemes

iii. Rowan Schemes

b) If you are Fatma, which scheme you will choose? Why?

QUESTION 2

Following information is related with worker's turn-replace and 3 workers of Syarikat Dang Wangi Sdn Bhd

Name of Worker	Tuah	Jebat	Lekir
Finishing Product (unit)	270	200	200
Standard time per unit (minute)	10	15	12
Time Taken (hour)	40	38	36
Rate per hour of pay (RM)	1.25	1.05	1.20
Rate per unit (RM)	0.20	0.25	0.24

You are required to calculate sum payable using the following method;

i. Halsey-Schemes

ii. Halsey-Weir Bonus Schemes

iii. Rowan Schemes

CHAPTER 6
OVERHEAD

OBJECTIVES

General Objective : To understand the concept of overhead , allocation and apportioned of overhead.

Specific Objectives : At the end of the unit you will be able to:

- Define overhead correctly
- Explain the classification of overhead
- Prepare overhead analysis sheet for the allocation and apportionment of overhead.
- Define overhead absorption rate correctly
- Calculate under and over absorption overhead

6.0 INTRODUCTION

Overhead costs are operating costs of a business enterprise, which cannot be traced directly to a particular unit of output. Production overhead consists of indirect materials, indirect labour and indirect expenses, which are incurred, in a manufacturing process.

The examples of overhead are depreciation on machinery, insurance of factory building, electric and heating, rent and rate of the factory. Overhead also becomes an increasingly large part of total manufacturing costs. It is used for budgetary control and decision-making purposes such as product pricing, expansion of business and make or buy decision.

6.1 THE CLASSIFICATION OF OVERHEAD

Overhead costs can be classified into :

a) factory overhead includes all indirect costs incurred by the manufacturing department from the receipt of raw materials until the product is finished and placed in a saleable state until they are sold and delivered.

b) administration overhead includes all indirect costs incurred in directing and controlling general company policies and programmes for the operation of the manufacturing and selling department of the enterprise.

c) selling and distribution overhead are also known as general business overheads, such as sales expenses, promotion and the salesmen salaries.

6.2 ALLOCATION AND APPORTIONMENT OF OVERHEAD

6.2.1 Departmentalization of overhead

Departmentalization of factory overhead means dividing the company into segments called cost centers to which expenses are incurred. A cost center is divisions of the company where cost generating activities are considered to take place. Mainly, there are two types of cost centers: productions department and services departments. A production department represents a subunit of the company where manufacturing activity takes place. Whereas, service departments represent cost centers which provide support for the production department.

6.2.2 Primary Distribution

Some overhead costs can be directly identified with a particular department or cost center and can be allocated specifically to the department. However, there are some overhead costs that cannot be identified and charged directly to a department. The costs must be apportioned to any department using such items. *Cost apportionment is the process of charging expenses in an equitable proportion to the various cost centers or department.*

In cost accounting this is known as primary distribution of overhead.

The following are the bases of apportionment, which are common in use:

a) Floor area occupied – Overhead such as lighting and heating, rent and rates, depreciation on building and building repairs.
b) Capital values- Depreciation on plant and machinery, insurance on building, and maintenance of plant and machinery.
c) Direct labour hour/ machine hour- tools and fixtures, power and work management remuneration.
d) Number of workers employed – Canteen, accident insurance, medical, personnel department expenses, supervision and wage department.
e) Kilowatt hours/capacity of machinery – Power

The choice of an appropriate basis is to ensure that cost apportioned to the cost centers reflects the benefit received. However, it must be pointed out that no matter how "appropriate' a basis is chosen, there always remain another acceptable basis. Hence the choice of the most appropriate is subjective.

Example

The Tanjung Company has four departments. A, B and C are the production departments and D is a servicing department. The actual costs for a period are as follows:

		RM
Indirect materials:		
Production department	A	950
	B	1200
	C	200
Servicing department	D	1500
Indirect wages:		
Production department	A	900
	B	1100
	C	300
Servicing department	D	1000
Rent		2000
Repair		1200
Depreciation		900
Light		200
Supervision		3000
Insurance		1000
Employee's insurance		300
Power		1800

The following data are also available in respect of the four departments:

	Dept. A	Dept. B	Dept. C	Dept. D
Area(sq. feet)	150	110	90	50
No. of workers	24	16	12	8
Total wage	RM8000	RM6000	RM4000	RM2000
Value of plant	RM24,000	RM18,000	RM12,000	RM6000
Value of stock	RM15,000	RM9000	RM6000	-

You are required to apportion the above costs to the various departments on the most equitable method.

Solution to Example

			Departments			
Items	**Basis**	Total	A	B	C	D
Indirect materials	**Allocation**	3850	950	1200	200	1500
Indirect wages	**Allocation**	3300	900	1100	300	1000
Rent	**Area**	2000	750	550	450	250
Repairs	**Plant value**	1200	480	360	240	120
Depreciation	**Plant value**	900	360	270	180	90
Light	**Area**	200	75	55	45	25
Supervision	**No. of workers**	3000	1200	800	600	400
Insurance	**Value of stock**	1000	500	300	200	-
Employees	**Wages**	300	120	90	60	30
Power	**Plant value**	1800	720	540	360	180
	Total	***17550***	***6055***	***5265***	***2635***	***3595***

6.2.3 Secondary Distribution

The overhead costs of service departments should be further assigned to production departments. This is due to the reason that service departments do not themselves manufacture anything. The reassignment or reapportionment of service departments overhead to production departments is termed as *secondary distribution.*

There are mainly two methods to deal with secondary distribution, example, Continuous Method and Direct Method.

a) Continuous Method: In this method, the process of apportioning service departments overhead is continued until the figure becomes immaterial

Example

Assume the following data for Kenanga Industries:
The departmental distribution (primary distribution) summary has the following totals:

Production Department			Service department	
A	B	C	X	Y
800	700	500	234	300

The expense of the service departments is charged out on a percentage basis as follows:

	A	**B**	**C**	**X**	**Y**
X	20%	40%	30%	-	10%
Y	40%	20%	20%	20%	-

You are required to show the reapportionment of overhead using **continuous method.**

Solution to Example : Continuous Method

	A	**B**	**C**	**X**	**Y**
Overhead Costs (Primary Distribution)	800	700	500	234	300
X – 234 (20:40:30:-:10)	47	94	70	-	23
Y - 323 (40:20:20:20:-)	128	65	65	65	-
X – 65 (20:40:30:-:10)	13	26	19.5	-	6.5
Y-6.5 (40:20:20:20:-)	2.6	1.3	1.3	1.3	-
Total overhead	990.6	886.3	655.8	0	0

a) Direct Method

This is the most common method of allocating service department costs to production departments because of its mathematical simplicity and ease of application. It involves allocation of service department costs directly to producing department and ignores any services provided by one service department to another.

Example

Assume the following data for Cempaka Industries:

The departmental distribution (primary distribution) summary has the following totals:

Production Department			Service department	
A	B	C	X	Y
800	700	500	234	300

The expense of the service departments is charged out on a percentage basis as follows:

	A	B	C	X	Y
X	20%	40%	30%	-	10%
Y	40%	20%	20%	20%	-

You are required to show the reapportionment of overhead using **direct method.**

Solution to Example: Direct method

	A	B	C	X	Y
Overhead Costs (Primary Distribution)	800	700	500	234	300
X - (20:40:30)	52	104	78	(234)	-
Y – (40:20:20)	150	75	75	-	(300)
Total Overhead	**1002**	**879**	**653**	**0**	**0**

6.3 ABSORPTION OF OVERHEAD COSTS

After all service departments overhead costs have been apportioned to production departments, the next step is to spread factory overhead to different products or job produced. This is termed as 'overhead absorption'.

6.3.1 Methods of Absorption

Some method of overhead absorption has to be applied to absorb factory overhead to individual products or jobs on some equitable basis. The rate, which is used to charge overhead costs to the products or jobs, is known as *absorption rate*. The following are the generally recognized methods of absorption rates:

$$\text{Overhead Absorption Rate (OAR)} = \frac{\text{Production Overhead}}{\text{Activity Level}}$$

The activity level that should be used are base on items such as direct labour hours, direct labour costs, machine hours, direct material costs and units of output. Selection of the base should be one which corresponds most closely with the total overhead costs of each department.

Example

The following data was collected for Jasmine factory:

Production overheads	RM10000
Direct labour hours	2000 hours
Direct labour costs	RM8000
Machine hours	4000 hours
Direct materials costs	RM5000
Production	2500 units

Calculate Overhead Absorption Rate (OBR) using the following bases:

a) Direct labour hours;
b) Direct labour costs
c) Machine hours;
d) Direct material costs; and
e) Production output.

Solution to Example:

a) OAR = Overhead / Direct labour hours

= 10,000 / 2000 DLH

= **RM5 per direct lab. hour.**

b) OAR = Overhead / Direct labour costs

= 10000 / 8000

= **125% of direct labour costs**

c) OAR = Overhead
Machine hours
= 10000
4000 machine hours
= ***RM2.50 per machine hour***

d) OAR = Overhead
Direct material costs
= 10000
5000
= **200% of direct material costs**

e) OAR = Overhead
Production output
= 10000
2500
= **RM4 per unit**

6.4 PREDETERMINED OVERHEAD RATES

Overhead absorption has been based on actual overheads for a costing period for costing of products. This method is, however, not satisfactory for costing purposes because:

a) The job cost calculations have to be deferred until all costs incurred are obtained.
b) Such problem of delay may be overcome by use of shorter period.

However, when production fluctuates due to seasonal or some other factors, the overhead rate would vary significantly from month to month. Production overhead costs may remain quite constant if comprised mainly of fixed elements. The use of actual overhead rate in charging overhead to similar products may result in varying unit costs.

$$\text{Predetermined OAR} = \frac{\text{Budgeted production Overhead for the year}}{\text{Budgeted Production for the year}}$$

6.5 UNDER OR OVER ABSORPTION OF OVERHEAD

Under actual costing, multiplying actual production with actual rates absorbs total overhead costs; the amount absorbed being the same with the amount incurred.

Under normal costing, total overhead costs are absorbed by multiplying actual production with predetermined rates, the amount absorbed is likely to be different from that incurred. The difference between these two amounts is called ***under or over absorbed overhead.***

Under and over absorption occurred when:

a) the amount of overhead expenditure incurred differs from the amount budgeted; and
b) the actual production volume differs from the budgeted production

Activity

6-1 What are overhead costs? Give FOUR (4) examples of overhead costs.

_____

_____

_____

6-2 List down and explain the classification of overheads costs.

_____

_____

_____

6-3 Mirza Furnishing Manufacturing has three production departments and two service departments. Overhead costs incurred for the month just ended are as follows:

	RM
Machine insurance	8000
Rent rates	21000
Indirect materials	5000
Heating and lighting	10000
Telephone expenses	2000
Depreciation	24000
Supervisors' salaries	6000
	76000

The three production department, A, B, and C and the two service departments X, and Y are housed in the same premises, the details of which, together with other statistics and information, are given below:

Departments

	A	B	C	X	Y
Floor area occupied (sq. meters)	3000	1500	1500	600	400
Direct labour hours	2000	1200	1800	-	-
Labour rates per hour	RM4	RM3	RM2	-	-
Machine value(RM000)	30	20	10	-	-
Value of materials issued (RM000)	100	50	30	-	-
Allocated overheads:					
Specific to each department	2900	3000	4000	1500	1000
Service department X's cost apportioned	50%	25%	25%	-	-
Service department Y's cost apportioned	20%	30%	50%	-	-

You are required to:

a) Prepare a statement showing the overhead cost for each department, showing the basis of apportionment used.

b) Calculate suitable overhead absorption rates.

c) Two pieces of furniture are made for customers. Direct costs are as follows:

		Job 123	Job 456
Direct materials		RM300	RM200
Direct labour(hours)	Dept. A	20	16
	Dept. B	12	10
	Dept. C	10	14

Calculate the total cost of each job.

6.4 The BBB Company has two production departments, Machining and Finishing and two service department, Materials Handling and Maintenance. The overhead budgets per hour week period are RM9,000 for the Machining department and 7,500for the Finishing department. The Machining Department overhead is absorbed on a machine hour basis (300 per period) and Finishing Department overhead is absorbed on the basis of direct labour hours(300 per period)

In establishing the overhead budgets of the production departments, service department costs have been dealt with as follows:

Maintenance Dept.:	60% to Machining Department
	30% to Finishing Department and
	10% to Materials Handling
Materials Handling:	30% to Machining Department
	50% to Finishing Department and
	20% to Materials Handling.

During period, the Machining Department was in operation for 292 hours and the number of direct labours worked by Finishing Department personnel was 3,100. Overhead incurred during the period was as follows:

	Machining	Finishing	Maintenance	Materials Handling
Materials	2000	3000	1000	200
Labour	3000	900	2000	3000
Other allocated costs	600	400	800	300

You are required to:

a) write up the overhead accounts for each of the production departments for the period showing the disposition of any under/over absorption;
b) State the factors which gave rise to the under/over absorption;

Feedback To Activity

6-1 Overhead costs are operating costs of a business enterprise, which cannot be traced directly to a particular unit of output. Production overhead consists of indirect materials, indirect labour and indirect expenses, which are incurred, in a manufacturing process.

The examples of overhead are depreciation on machinery, insurance of factory building, electric, heating, rent and rate of the factory.

6-2 Overhead costs can be classified into :

a) *Factory overhead* includes all indirect costs incurred by the manufacturing department from the receipt of raw materials until the product is finished and placed in a saleable state until they are sold and delivered.
b) *Administration overhead* includes all indirect costs incurred in directing and controlling general company policies and programmes for the operation of the manufacturing and selling department of the enterprise.
c) *Selling and distribution overhead* are also known as general business overheads, such as sales expenses, promotion and the salesmen salaries.

6-3 a) Production Overhead analysis and apportionment statement.

Overhead	Basis	Total Cost	Production departments			Service departments	
			A	B	C	X	Y
Allocated costs		12 400	1 500	1 000	2 900	3 000	4 000
Machine insurance	Machine value	8 000	-	-	4 000	2 667	1 333
Rent and rates	Floor area	21 000	1 800	1 200	9 000	4 500	4 500
Indirect materials	Value of mat. issued	5 000	-	-	2 778	1 389	833
Heating and lighting	Floor area	10 000	857	571	4 286	2 143	2 143
Telephone	Labour hours	2 000	-	-	800	480	720
Depreciation	Machine value	24 000	-	-	12 000	8 000	4 000
Supervisors' salaries	Direct labour hours	6 000	-	-	2 400	1 440	2 160
		88 400	**4 157**	**2 771**	**38 164**	**23 619**	**19 689**
Apportionment of:							
X's costs			(4 157)	-	2 079	1 039	1 039
Y's costs			-	(2 771)	554	831	1 386
			-	-	**40 797**	**25 489**	**22 114**

b) Using direct labour hours as a basis for absorption:

Direct labour hours	2,000	1,200	1,800
Overhead absorption rates	RM20.400	RM21.240	RM12.286

c)

	Job 123	**Job 456**
	RM	RM
Direct material	300	200
Direct labour:		
Department A (RM4 per hr)	80	64
Department B (RM3 per hr)	36	30
Department C (RM2 per hr)	20	28
	436	322
Overhead absorbed:		
Department A (RM20.4/ hr)	408	326
Department B (RM21.24/hr)	255	212
Department C (RM12.286/hr)	123	172
Total cost	**1 222**	**1 032**

6-4 a) Calculate the predetermined overhead absorption rates:

Machining Department:

Overhead absorption rate = Budgeting Overhead / Budgeting Machine Hours

= RM9 000 / 300 MH

= **RM30 per machine hour**

Finishing Department:

Overhead Absorption Rate = Budgeting Overhead / Budgeting Machine Hours

= RM7 500 / 3000 DLH

= **RM2.50 per direct labour hour**

b) Allocate and apportion overheads to Machining and Finishing Departments.

Overhead Analysis Sheet

	Maintenance	**Materials Handling**	**Machining**	**Finishing**
	RM	**RM**	**RM**	**RM**
Allocated Cost:				
Materials	1,000	200	2,000	3,000
Labour	2,000	3,000	3,000	900
Other costs	800	300	600	400
	3,800	3,500	5,600	4,300
Redistribution of service department costs:				
Maintenance	(3,800)	380	2,280	1,140
Materials handling	776	(3,880)	1,164	1,940
Maintenance	(776)	77	466	233
Materials handling	15	(77)	23	39
Maintenance	(15)	-	10	5
	-	-	9,543	7,657

SELF-ASSESSMENT

Question 6-1

Daisy Ltd., absorbs its production overhead by using predetermined rates – a percentage on direct labour cost for Department P and a machine hour rate (calculated to three decimal places) for Department Q.

The estimates made at the beginning of the financial year which ended on 31 October were as follows:

	Dept. P	**Dept. Q**
Direct labour cost	RM450,000	RM150,000
Production Overhead	RM517,500	RM922,500
Direct labour	172,500 hrs	40,000 hrs
Machine	20,000 hrs	180,000 hrs

For the month of October, the cost sheet for Job No. 186 shows the following information:

	Dept. P	**Dept. Q**
Materials used	RM200	RM800
Direct labour	RM360	RM190
Direct labour	120 hrs	47.5 hrs
Machine	20 hrs	260 hrs

Following the end of the financial year it was ascertained that actual production overhead incurred by Department P was RM555,000 and that incurred by Department Q was RM900,000.

You are required to:

a) Calculate the overhead absorption rates for each of the departments

b) Determine the total production overhead cost to be charged to Job No. 186 for October.

c) Show the over/under absorbed overhead for each department and for the company as a whole for the year ended 31 October assuming

that actual direct labour cost and machine hours worked were as originally estimated.

d) Comment on the choice of an overhead absorption rate based on direct labour coast for Department P.

Feedback To Self-Assessment

6-1

a) Overhead absorption rates

	Department P		Department Q
=	Production Overhead / Direct labour	=	Production Overhead / Direct labour
=	517 500 X 100 / 450 000	=	922 500 / 150000
=	**115%**	**=**	**RM5.125**

b) Production overhead to be absorbed by Job 186 for October

Direct labour cost	RM360	Machine hours	RM260
Absorption rate	115%	Absorption rate	x 5.125
	RM414		RM1 332.5
	=======		=====

c) Over/under absorbed overhead

Direct labour cost	RM450,000	Machine hours	180,000
Absorption rate	x 1.15	Absorption rate	x 5.125
	RM517 500		RM922 500
Incurred	555 000		900 000
	(37 500)		RM22 500
	=====		======
Overall		(RM15,000)	

This analysis shows that RM15,000 has been under-absorbed.

d) Overhead absorption rate based on direct labour cost is not recommended because labour rates change and / or there may be different rates of pay within the department, either of which would distort the absorption.

Essentially, overhead is incurred as a function of time, so a time based absorption rate such as direct labour hour rate should be used. A direct labour hour rate would reflect more accurately the time spent in production

EXERCISE

Question 1

The Tulip company has 2 departments A and B. The following is the overhead of company in 2022:

Department	**RM**
Insurance/Area/Machine value	5 600
Water & Electricity /area	9 600
Power/power of machine	4 500
Machine Repair/machine working hour	2 100
Salaries/NOW	25 200
Depreciation Machine/Machine value	11 000
Building rental/area	6 000
General Supervision/NOW	9 000

The Following data are also available in respect of two departments

	Department A	Department B
No. of workers	45	15
Area of building (sq. feet)	4 000	1 000
Machine working hours	25 000 hour	10 000 hour
Direct labour hours	48 000 hour	24 000 hour
Machine value	RM 35 000	RM 20 000
Power of machine (kilowatt)	12 000	8 000

a) You are required to apportion the above costs to the various departments on the most equitable method.

Question 2

The Sweet Pea Company has 3 departments X,Y and Z. The following is the overhead of company in 2022:

Department	**RM**
Power	12 800
Rent & Rates	4 800
Light	1 600
Building Insurance	2 400
Machine Insurance	1 500
Depreciation Machine	10 000
General Supervision	1 200
Machine Maintenance cost	3 600
Salary	24 800

The following information is related to the 3 departments

	Department X	Department Y	Department Z
Power of machine (kilowatt)	1 800	1 200	1 000
Area of building (sq. feet)	5 000	3 500	1 500
Machine value	RM 25 000	RM 15 000	RM 10 000
No. of workers	200	150	50
Machine working hours	30 000 hour	20 000 hour	10 000 hour

You are required to apportion the above costs to the various departments on the most equitable method.

Question 3

The Lilac Company has 2 departments A and Z. The following is the overhead of company in 2022:

Department	**RM**
Power	3 600
Rent & Rates	7 500
Electricity	6 000
Building Insurance	4 500
Depreciation Machine	12 000
General Supervision	4 200
Machine Maintenance cost	2 700

The Following data are also available in respect of two departments

	Department A	Department Z
Area of building (sq. feet)	8 000	7 000
No. of workers	80	60
Power of machine (Horse Power)	300	200
Machine value	RM 40 000	RM 20 000
Machine hours	5 000	4 000
Direct labour hours	12 000	8 000
Production volum (units)	50 000	40 000

a) Using an appropriate basis, show how overhead is distributed between the two departments

b) Calculate **THREE (3)** overhead absorption rates for each department

Question 4

An engineering company, Hasbi Ltd has five cost centers: three production departments – Machine Workshop, Welding Workshop and Installation Workshop, and two service departments – Maintenance and Energy Centre. In practice the business using the following rates for each department :

Machine Workshop RM 2.00 per hour machine
Welding workshop 100% of direct labor cost
Installation workshop of RM 1.00 per direct labor

	Machine Workshop	Welding workshop	Installation workshop	Maintenance	Energy Centre
Indirect wages	400	800	300	250	250
Indirect material	800	1 200	500	300	200
Repair & maintenance	3 000	2 500	1 500	2 000	1 000

Other costs:	**RM**
Rent	10 000
Power	2 000
Lighting	5 000
Depreciation of equipment	10 000
Insurance for equipment	1 000

Basic of the following distribution can be obtain:

	Labor cost	Machine hour	Area covered (Sq. ft.)	Direct labor hour	Effective horse power	No. of worker	Value of equipment
Machine workshop	21 000	7 000	200	8 000	40	20	30 000
Welding workshop	19 000	6 000	400	11 500	30	10	20 000
Installation workshop	10 000	5 000	300	10 500	20	30	20 000
Maintenance	-	-	50	-	5	20	15 000
Energy Centre	-	-	50	-	5	20	15 000
	50 000	18 000	1 000	30 000	100	100	100 000

It was decided that the cost of service cost centers should be divided as follow:

	Machine Workshop	Welding workshop	Installation workshop	Maintenance	Energy Centre
Maintenance	20	50	30	-	-
Energy Centre	30	60	10	-	-

You are required to:

a) Prepare the overhead analysis using basis given
b) Show the reapportionment of overhead using direct method between production cost center and service cost center
c) Show Over/Under Absorption in every department

CHAPTER 7
MARGINAL COSTING AND ABSORPTION COSTING

OBJECTIVES

General Objective : To understand the marginal costing and Absorption costing.

Specific Objectives : At the end of the unit you will be able to:

- Define the meaning of marginal costing and absorption costing
- Distinguish the differences between marginal costing and absorption costing
- Explain the benefit and limitations of marginal costing and absorption costing.
- Evaluate cost per unit marginal costing and absorption costing
- Prepare income statement under both systems
- Produce a reconciliation profit under marginal costing and absorption costing

7.0 INTRODUCTION

Every business that produce product must determine their product costs. Marginal costing and Absorption costing are two system used in determining product cost. The difference between these two systems is determined by the treatment of fixed manufacturing overheads is calculating product cost.

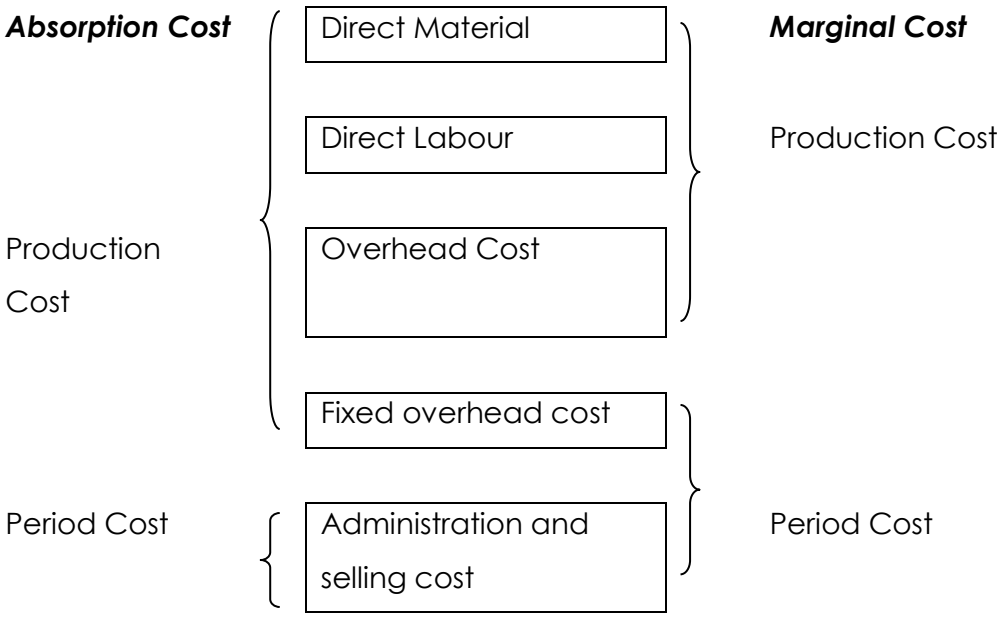
7.1 Definition of Marginal Costing

Marginal costing also known as Direct Costing or Variable Costing. Marginal Costing is the accounting system in which variable costs are charged to the cost unit and fixed cost are not absorbed into cost units but are written off in the profit and loss account for the period

7.1.1 Marginal costing and stock valuation

Stock is valued at the variable production cost. Examples of variable cost are direct material, direct labour and direct expenses **The concept of contribution**

- Contribution is total sales less all the variable costs
- Contribution can be calculated on a per unit basis or on total basic



The formula of contribution

Contribution = Sales – Total variable production costs

The Format of Profit Statement for Marginal Costing

Rose Company

Profit Statement for the year ended 31 December 2022 using marginal costing

	RM	RM
Sales		XXX
Less : Production cost		
Opening stock	XX	
Add : Variable production cost	XX	
	XXX	
Less : Closing stock	XX	XXX
Contribution Margin		XXX
Less : Fixed overhead costs	XX	
Fixed production costs	XX	
Total fixed overhead costs		XXX
Operating profit/ (loss)		XXX

7.2 Definition of Absorption Costing

Absorption costing is a cost accounting system that charges both fixed and variable production overheads to cost units.

7.2.1 Absorption costing and stock valuation

Under absorption costing, fixed production overheads costs are also included in stock valuation using predetermined absorption rate

The format of Profit Statement for Absorption Costing

Ati-Ati Company

Profit Statement for the year ended 31 December 2022 using absorption costing

	RM	RM
Sales		XXX
Less : Production cost		
Opening stock	XX	
Add : Variable production cost	XX	
Add : *Fixed production cost*	XX	
	XXX	
Less : Closing stock	XX	XXX
Gross Profit		XXX
Over/(under) absorption		XXX/(XXX)
Less : Fixed overhead costs	XX	
Administration & Selling cost	XX	
Total fixed overhead costs		XXX
Operating profit/ (loss)		XXX

7.3 COMPARISON BETWEEN MARGINAL COSTING AND ABSORPTION COSTING

Table 7.1 shows the comparison between marginal costing and absorption costing

	Marginal Costing	Absorption Costing
Product cost	Only variable production costs	Variable and fixed production costs
Period cost	All fixed cost are treated as period costs	The non-production fixed costs are treated as period cost
Inventory valuation (work-in-progress and finished goods)	Value at variable cost	Value at total production cost using both fixed and variable cost
Decision making	Relevant	Irrelevant
External reporting	Not acceptable	Acceptable

7.4 PRODUCT COST UNDER MARGINAL COSTING AND ABSORPTION COSTING

Marginal costing and absorption costing are two different techniques used in determine product costs. The elements of product costs for each approach are as follow:

a) Marginal costing

Direct material costs per unit	XX
Direct labour costs per unit	XX
Direct expenses per unit	XX
Variable production overheads per unit	XX
Total Product Costs	**XX**

b) Absorption costing

Direct material costs per unit	XX
Direct labour costs per unit	XX
Direct expenses per unit	XX
Variable production overheads per unit	XX
Fixed production overheads per unit	XX
Total Product Costs	**XX**

Product cost under marginal costing system and absorption costing system are illustrated in example below;

Bougenville makes and sells a single product. The budgeted selling price of the product is RM120 per unit and budgeted costs are as follows:

Budgeted variable manufacturing cost per unit	RM
Direct material used	20
Direct labour	10
Direct expenses	10
Variable production overheads	20

Fixed manufacturing overhead costs are budgeted at RM160 000 per annum. Normal production levels are expected to be 80 000 unit per annum

Budgeted selling and distribution costs are as follows:

Variable	RM20 per unit sold
Fixed	RM30 000 per annum

There is no inventory on 1 January 2021

The sales and production is expected to be as follows;

	2021	2022
Sales (units)	60 000	75 000
Production (units)	70 000	80 000

Compute the product costs using marginal and absorption costing.

Solution

	Marginal costing	Absorption costing
Direct material	20	20
Direct labour	10	10
Direct expenses	10	10
Variable manufacturing overheads	20	20
Fixed manufacturing overhead		2 *
Total Product Cost	60	62

* RM160 000/80 000 unit = RM2

Example

7-1 Debunga Company produces a type of finished goods item and the following is information regarding its operations in 2022

	Unit
Opening inventory	0
Production	25 000
Sales	20 000
Closing inventory	5 000
Selling price/unit	RM 6.00

Production cost per unit	RM
Materials	1.20 per unit
Labor	2.00 per unit
Variable Overhead	0.60 per unit

Fixed factory overhead is absorbed based on the following budget:

Fixed overhead budgeted	RM 20 000
Budgeted volume	25 000 unit

Used the information above to prepare Income Statement for the year ended 2022 based on:

i. Absorption Costing

ii. Marginal Costing

Debunga Company

Profit Statement for the year ended 31 December 2022

(Absorption Costing Approach)

	RM	RM
Sales (20 000 unit X RM6.00)		120 000
Less : Production cost		
Opening stock	-	
Add : Variable production cost		
(25 000 unit X RM4.60)	115 000	
	115 000	
Less : Closing stock	23 000	92 000
Gross Profit		28 000
Less : Selling and administrative expenses		
Variable	4 000	
Fixed	7 500	
Total fixed overhead costs		11 500
Operating profit/ (loss)		16 500

7.5 RECONCILING THE PROFIT UNDER MARGINAL COSTING AND ABSORPTION COSTING

The different value of inventory under marginal costing and absorption costing income statement changes the amount of net income. An increase or decrease of inventory during the year cause the income reported under marginal costing and absorption costing to be different. This is the result of the fixed production overhead included under marginal costing. The difference in profit under both system needs to be reconciled as follow:

POR (Predetermined overhead absorption rate)

= Budgeted fixed production overhead

Budgeted level of activity

Notes: fixed overhead is absorbed based on the following absorption rate:

Budgeted fixed production overhead = 20 000 = RM0.80 per unit

Budgeted level of activity 25 000

Production Cost :	RM
Materials	1.20
Labor	2.00
Variable Overhead	0.60
Fixed Overhead	0.80
	4.60

Debunga Company

Profit Statement for the year ended 31 December 2022

(Marginal Costing Approach)

	RM	RM
Sales (20 000 unit X RM6.00)		120 000
Less : Production cost		
Opening stock	-	
Add : Variable production cost		
(25 000 unit X RM3.80)	95 000	
	95 000	
Less : Closing stock (5 000 X RM3.80)	19 000	76 000
Gross Profit		44 000
Less : Selling and administrative expenses		
Variable		4 000
		40 000
Less : Fixed cost and expenses		
Fixed overhead	20 000	
Fixed Selling and administrative expenses	7 500	27 500
Operating profit/ (loss)		12 500

Notes:

- Fixed factory overhead is not a production cost and is written off as a period cost
- Production Cost :

	RM
Materials	1.20
Labor	2.00
Variable Overhead	0.60
	3.80

7-2

The following information is available on Syarikat Seroja Sdn Bhd

Data per unit :	RM
Selling price	35
Direct material cost	8
Direct labour cost	5
Variable production overheads	2
Variable selling & administrative cost	3

Annual fixed cost	RM
Production overheads	85 000
Selling & administrative expenses	15 000

Other Information :	2021 (units)	2022 (units)
Opening Stock	0	? 500
Production	8 000	8 500
Sales	7 500	9 000

Based on the information above, prepare income statement for the year 2021 and 2022 using marginal cost and absorption cost

Cost per unit	Marginal		Absorption	
	2019	2020	2019	2020
Direct material	8	8	8	8
Direct labour	5	5	5	5
Variable production overheads	2	2	2	2
Fixed production overhead	-	-	85 000/8 000 = 10.63	85 000/8 500 = 10.00
Production cost	15	15	25.63	25

Seroja Sdn Bhd

Income Statement for the year ended 2021 & 2022 using marginal costing

	(2019)RM	(2020)RM
Sales 7 500 / 9 000 @ RM 35	**262 500**	315 000
Less : Production cost		
Opening stock 0/500 @ RM15	0	7 500
Add : Variable production cost 8 000/8 500 @ RM15	120 000	127 500
	120 000	
Less : Closing stock 500/ @RM15	(7 500)= **112 500**	XXX
Contribution Margin	150 000	XXX
Less : Fixed overhead costs	XX	
Administration & Selling cost	XX	
Total fixed overhead costs		XXX
Operating profit/ (loss)		XXX

Exercise

Question 1

The following information pertaining to costs incurred for Syarikat Iris for the year 2022:

	Unit
Opening inventory	0
Production	20 000
Sales	16 000

Selling price/unit	RM 8.50

Production cost per unit	RM
Materials	1.25
Labor	2.20
Variable Overhead	1.10

Factory overhead is absorbed at RM 0.65 per unit and the actual fixed overhead is RM 12 000

Variable sales and administration	RM 15 000
Fixed sales and administration	RM 12 000

You are required to prepare Income Statement for the year ended 2022 based on:

iii. Marginal Costing

iv. Absorption Costing

Question 2

Camellia company produces finished goods item and the following is information regarding the Camellia Company operations in 2022

Opening stock	none
Unit produced	25 000 unit
Sales	20 000 unit
Closing stock	5 000 unit
Manufacturing cost (per unit)	
Direct material	RM 1.20
Direct labour	RM 2.00
Variable overhead	RM 0.60
Selling & administration expenses:	
Variable	RM 4 000
Fixed	RM 7 500
Selling price/unit	RM 6.00

Fixed factory overhead is absorbed based on the following budget :

Budgeted Fixed Overhead RM 20 000

Budgeted volume 25 000 unit

Based on the information above, prepare income statement using marginal cost and absorption cost

CHAPTER 8
VARIANCE ANALYSIS

General Objective: To understand and apply the principles of variance analysis.

Specific Objectives: At the end of the unit you will be able to:

- Explain the meaning of variance.
- Calculate basic material, labour and overhead variances.
- Identify the typical causes of each variance and its implications.
- Make an adjustment between actual profit and standard profit.

8.0 INTRODUCTION

In controlling the operations of business, managers would always want to know how effectively and efficiently the business is being operated. To achieve this end, actual performance is compared to an expected performance. Standard costing is a technique which establishes predetermined estimates of the costs of products and services and then compares these predetermined costs with actual costs that are incurred. The predetermined costs are known as ***standard costs.***

8.1 DEFINITION OF VARIANCE

The difference between the standard cost and actual cost incurred during a period is known as a ***variance***. The process by which the total difference between actual cost and standard cost is broken down into its different item is known as ***variance analysis.***

Variance analysis is the investigation and classification of variances. Variances are investigated to find better ways of adhering to standards, of changing standards or of achieving goals or targets. Variances are classified so that the cause can be identified in order that corrective actions can be taken and responsibility pinpointed. Cost control is aided by analysing and reporting variances. Where the actual costs exceed the standard costs, the difference is referred to as **unfavourable** (UF) or **adverse variance**. Where the standards costs exceed the actual cost, the difference is a **favourable variance** (F).

8.2 TYPES OF VARIANCES

Variance analysis involves two phases that are computation of individual variances (material, labour and overheads) and determination of the cause(s) of each variance.

8.2.1 Direct Material Cost Variances

There are two cost variances on materials :

- materials price variance which shows the difference between the actual price and the standard price. The buyer or purchasing officer is responsible for the price variance.
- materials usage variance which shows the difference between the actual quantity of materials used and the quantity of materials that ought to be used. The production manager is responsible for the usage variance.

Example 8.1

The standard material cost of producing one unit of POP is RM10, comprising 2 kg of material X at a standard material price of RM5 per kg.

In August 1,000 units of POP were produced and the actual quantity of X bought and consumed was 2,100 kg. The actual price paid for material X was RM4.80 per kg.

a) Material Price Variance (MPV)

Formula 8.1:

MPV = (Actual Price – Standard Price) x Actual Quantity Purchased / Used
= (AP - SP) x AQ

Solution to Example 8.1(a):

MPV = (AP - SP) x AQ
= (RM4.80 - RM5.00) x 2,100 kg
= RM420 (F)

Note : If the purchase quantity is not given in a question, always assume that it is the same as the actual usage quantity.

b) Material Usage Variance (MUV)

Formula 8.2:

MUV = (Actual Quantity Used – Standard Quantity) x Standard Material Price
= (AQ - SQ) x SP

Solution to Example 8.1(b):

MUV = (AQ - SQ) x SP
= [2,100 – (1,000 units x 2 kg)] x RM5
= [2,100 – 2,000] x RM5
= RM500 (A)

c) Material Cost Variance

Formula 8.3:

Material Cost Variance	=	Material Price Variance + Material Usage Variance
MCV	=	MPV + MUV

Solution to Example 8.1(c):

Material Cost	Variance	=	Material Price Variance + Material Usage Variance
		=	RM420 (F) + RM500 (A)
		=	RM80 (A)

Activity

8.1 State the definition of variance.

_____

_____

_____

_____

8.2 The following data is available:

Standard price per kg	RM0.60
Actual price per kg	RM0.50
Actual quantity used	4,500 kg
Actual quantity purchased	5,000 kg

Calculate the material price variance:

(i) at the time of purchase

(ii) at the time of issue.

8.3 The following information is available:

Standard output	900 units
Actual output	1,000 units
Actual quantity used	4,500 kg

Standard material cost per unit 4 kg at RM0.60 per kg = RM2.40

Calculate the material usage variance.

Feedback to Activity

8.1 Variance is defined as the difference between actual results and expected results during a period. The variance can be computed in quantitative or financial terms.

8.2 Material Price Variance

(i) At the time of purchase

MPV = (Actual Price – Standard Price) x Actual Quantity Purchased

= (AP – SP) x AQ

= (RM0.50 – RM0.60) x 5,000 kg

= RM500 (F)

(ii) At the time of issue

MPV = (Actual Price – Standard Price) x Actual Quantity Purchased

= (AP – SP) x AQ

= (RM0.50 – RM0.60) x 4,500 kg

= RM450 (F)

8.3 Material Usage Variance

MUV = (Actual Quantity Used – Standard Quantity) x Standard Material Price

= (AQ – SQ) x SP

= [4,500 kg – (1,000 units x 4)] x RM0.60

= 500 kg x RM0.60

= RM300 (UF)

8.2.2 Direct Labour Cost Variances

Direct labour cost variances are usually analyses into:

- Labour rate variance which shows the difference between the actual wages rate paid to the workers and the standard rate set.
- Labour efficiency variance which shows the difference between the actual hours used and the hours that ought to be used (the standard hours).

Example 8.2

Every unit of POP requires 4 hours to produce. Standard labour rate of the company is RM0.50 per hour.

In August, the workers took 4,200 hours to produce 1,000 units of POP. Total wage cost in August was RM1,890.

a) Labour Rate Variance (LRV)

Formula 8.4:

LRV	=	(Actual Rate – Standard Rate) x Actual Hours Paid
	=	(AR - SR) x AH

Solution to Example 8.2(a):

LRV = (AR - SR) x AH
= (RM0.45 – RM0.50) x 4,200 hours
= RM 210(F)

Note : The actual wage rate = RM1,890 / 4,200 hours
= RM0.45 per hour

b) Labour Efficiency Variance (LEV)

Formula 8.5:

LEV = (Actual Hours Worked – Standard Hours) x Standard Rate
= (AH - SH) x SR

Solution to Example 8.2(b):

LEV = (AH - SH) x SR
= [4200 – (1,000 units x 4 hours) x RM0.50
= RM 100 (UF)

c) Labour Cost Variance (LCV**)**

Formula 8.6:

Labour Cost Variance = Labour Rate Variance + Labour Efficiency Variance
LCV = LRV + LEV

Solution to Example 8.2(c):

Labour Cost Variance = Labour Rate Variance + Labour Efficiency Variance
= RM210 (F) + RM100 (UF)
= RM110 (F)

Activity

8.4 In the manufacture of Widuri, 100 employees are engaged at a standard rate of RM3.60 per hour. A forty-hour week is in operation and there are four weeks in February. The standard performance is set at 240 articles per hour. During February, 91 employees were paid at the standard rate, but 5 employees were paid at RM3.65 an hour and 4 employees were paid at RM3.55 per hour. The factory stopped production for two hours because of a power failure. Actual production was 38,640 units.

You are required to calculate :

a) Direct labour rate variance

b) Direct labour efficiency variance

Feedback to Activity

8.4 (a)

Direct labour rate variance

= (AR - SR) x AH

= (RM3.65 – RM3.60) x 800 =RM40 (UF)

= (RM3.55 – RM3.60) x 640 =RM32 (F)

RM8 (UF)

8.4 (b)

Direct labour efficiency variance

= (AH - SH) x SR

= (15,800 – 16,100) x RM3.60

= RM1, 080 (F)

Workings 1(a)

Actual hours (i)

= 5 employees x 40 hours x 4 weeks

= 800 hours

Actual hours (ii)

= 4 employees x 40 hours x 4 weeks

= 640 hours

Workings 1(b)

(i) Actual hours:

= 100 employees x 158 hours worked

= 15,800 hours

(ii) Standard hours:

= 100 x 38,640 / 240

= 16,100 hours

Exercise

Question 1

The following standards have been set by the Amaryllis company to manufacture a type of finished goods:

The standard price of materials per unit is	RM 3.60
Standard quantity of material	4 units

In January 2022, a total of 1 350 units of finished goods were produced and the materials that were actually used to produce all the above finished goods were as follows:

5 670 units at a cost of RM 19 845

Calculate:

a. Standard quantity to produce 1 350 units of finished goods
b. Material price variances and Material Consumption/Usage variances

Question 2

Zehra Company has set the following standards for the type of labor used

The standard hour wage rate is	RM6.20
The standard hour is	2.8 hours per unit

In May 2022, a total of 10 500 units of finished goods were produced and the labor that was actually used was as follows:

31 500 hours at a cost of RM 196 875

Calculate:

a. Standard hours for producing 10 500 units of finished goods
b. Labor rate variance and labor efficiency variance

Question 3

The following standards have been set by the Teratai Company for a type of labor used to process its products:

The standard hours wage rate is	RM4.70
Standard hours per unit	3 hours

In August 2022, a total of 1,960 units of finished goods were produced and the labor used was as follows:

5 390 hours at a cost of RM26 411

Calculate:

a. Standard hours for producing 1 960 units of finished goods

b. Labor rate variance and labor efficiency variance

Question 4

Nilofar Company has set the following standards to produce one unit of product for March 2022:

Standard Material:	3 units at a price of RM1.20 per unit
Standard Labor:	2 hours at RM4.00 per hour

In March 2022, a total of 5 500 units of the product were made. The materials and labor that have actually been used to produce the product are as follows:

Materials:	18 700 units at a cost of RM26 180
Labor:	12 100 hours at a cost of RM30 250

Calculate:

a. Material price variances and material consumption/usage variances

b. Labor rate variance and labor efficiency variance

Question 5

Dahlia Company process a type of product and the standards that have been set for the materials and labor used to manufacture the product are as follows:

Standard material:	2.4kg at a price of RM0.60 per kg
Standard labor:	4.5 hours at RM2.50 per hour

In January 2022, a total of 4 000 units of the product were made. The materials and labor that have been used to process this product are as follows:

Materials used:	10 000 kg at a cost of RM7 500
Labor used:	20 000 hours at a cost of RM54 000

Calculate:

a. Material price variance and material consumption/usage variance

b. Labor rate variance and labor efficiency variance

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