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B.B.A

Third Year

(Osmania University)

Latest Edition
2018

MANAGEMENT ACCOUNTING

- ☞ **STUDY MANUAL**
- ☞ **SOLVED PROBLEMS**
- ☞ **SHORT NOTES**
- ☞ **MODEL PAPER**
- ☞ **SOLVED QUESTION PAPERS**

- by -

WELL EXPERIENCED LECTURER

RAHUL PUBLICATIONS

Hyd. Ph : 65500071 Cell : 9391018098.

B.B.A

Third Year

(Osmania University)

MANAGEMENT ACCOUNTING

Study Manual, Solved Problems, Short Notes and Model Paper

Inspite of many efforts taken to present this book without errors, some errors might have crept in. Therefore we do not take any legal responsibility for such errors and omissions. However, if they are brought to our notice, they will be corrected in the next edition.

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Unit-I: COST ACCOUNTING

i) Definition, Objectives, Functions, Significance, advantages & limitations of Cost Accounting

ii) Concept of cost, elements of cost & Components of total cost. Classification of costs based on their nature, functions? Behavior.

iii) Cost sheet, cost unit Vs cost centre, cost estimation Vs cost ascertainment, cost allocation Vs cost apportionment, and cost reduction Vs cost control.

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ii. Need, Importance, Tools, techniques, Advantages & Limitations of Management Accounting

iii. Methods & systems of costing. Relationship between Financial Accounting & Cost Accounting; Financial Accounting & Management Accounting; and Cost Accounting & Management Accounting

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i. Meaning of Financial Ratio. Classification, Advantages & Limitations of Ratio Analysis

ii. Liquidity Ratios; Leverage Ratios; Turnover Ratios;

iii. Profitability Ratios based on investment & sales

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i. Definition of Marginal Costing & Absorption Costing. Differences between Marginal Costing & Absorption Costing, Income determination under marginal & absorption costing.

ii. Marginal cost equation. CVP Analysis, P/V Ratio, Break-even point & Margin of safety

iii. B-E charts: Graphic method of B.E Analysis, Merits and disadvantages of B.E charts

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i. Budget, Budgeting & Budgetary control; Objectives, Characteristics & essentials of Budgetary control

ii. Organization of Budgetary control system, budget centre, Budget manual, Budget committee & Budget period

iii. Budgeting Vs Forecasting. Advantages & Limitations of Budgeting

iv. Standard cost & standard costing. Types of Standards, steps involved in Standard Costing

v. Differences between Standard costs and Estimated costs, Similarities differences between Standard Costing and Budgetary Control; Advantages and Limitations of Standard Costing.

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UNIT I

COST ACCOUNTING

i) Definition, Objectives, Functions, Significance, advantages & limitations of Cost Accounting

ii) Concept of cost, elements of cost & Components of total cost. Classification of costs based on their nature, functions? Behavior.

iii) Cost sheet, cost unit Vs cost centre, cost estimation Vs cost ascertainment, cost allocation Vs cost apportionment, and cost reduction Vs cost control.

1.1 COST ACCOUNTING

Introduction

Cost accounting examines the cost structure of a business. It does so by collecting information about the costs incurred by a company's activities, assigning selected costs to products and services and other cost objects, and evaluating the efficiency of cost usage. Cost accounting is mostly concerned with developing an understanding of where a company earns and loses money, and providing input into decisions to generate profits in the future.

Cost accounting is a process of collecting, analyzing, summarizing and evaluating various alternative courses of action. Its goal is to advise the management on the most appropriate course of action based on the cost efficiency and capability. Cost accounting provides the detailed cost information that management needs to control current operations and plan for the future

Cost accounting involves the techniques for :

1. Determining the costs of products, processes, projects, etc. in order to report the correct amounts on the financial statements, and
2. Assisting management in making decisions and in the planning and control of an organization.

1.1.1 Definitions of Cost Accounting

1. Definition of Cost

Cost may be define as the price of any asset when one company purchases it or it may the expenses for getting services. So, we can say that cost is total amount which is sacrificed for getting the goods, services and assets.

In general , cost is calculated on production of goods . Total cost represents cost of raw material , cost of labour and cost of overheads after adding above we can find total cost and if we divide total number of units, then we can find cost per unit.

2. Definition of Costing

Costing is technique to determine the cost. It involves the process and method to classify and analysis of different expenditures.

3. Definition of Cost Accounting

Cost accounting is science of recording , classify , analyzing and allocation of cost to cost centers or cost unit . It also include cost control .

According to W.W.Bigg- "Cost accounting is the provision of such analysis and classification of expenditure as it will enable the total cost of any particular unit of production to be ascertained with reasonable degree of accuracy and at the same time to disclose exactly how such total cost is constituted."

According to R.N. Carter, "Cost accounting is a system of recording in accounts the materials used and labour employed in the manufacture of a certain commodity or on a particular job."

4. Cost Accountancy

According to the Institute of Cost and Management Accountants, London, cost accountancy is the application of costing and cost accounting principles, methods, techniques etc., to the science, art and practice of cost control, cost audit and ascertainment of profitability.

1.1.2 Objectives of Cost Accounting

1. **Ascertainment of Cost :** The primary objectives of the cost accounting is to ascertain cost of each product, process, job, operation or service rendered.
2. **Ascertainment of Profitability :** Cost accounting determines the profitability of each product, process, job, operation or service rendered. The statement of profit or losses and Balance Sheet also submitted to the management periodically.
3. **Classification of Cost :** Cost accounting classifies cost in to different elements such as materials, labour and expenses. It has further been divided as direct cost and indirect cost for cost control and recording.

4. **Control of Cost :** Cost accounting aims at controlling cost by setting standards and compared with the actual, the deviation or variation between two is identified and necessary steps are taken to control them.
5. **Fixation or Selling Prices :** Cost accounting guides management in regard to fixation of selling prices of the products. It is also helpful for preparing tender and quotations.

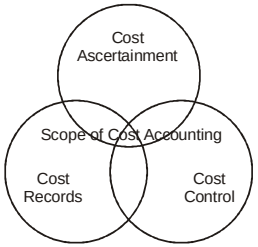
1.1.3 Functions of Cost Accounting

The following are the important functions of Cost Accounting

- **Ascertainment of cost of product :** Cost Accounting ascertains cost of production of each job, process, or work order by applying different methods of cost accounting, such as job costing, process operation costing, contract costing etc. according to the suitability and needs of the organization.
- **Fixation of selling prices :** Cost accounting helps to find out cost of production and fixation of selling prices of the product or process job or operation. It also helps in preparing necessary tenders or quotations.
- **Measurement of efficiency :** Cost accounting measures the efficiency of each product, process or departments by applying standard cost method.
- **Cost control procedure :** Cost accounting controls cost by setting standards and compared with the actual. The deviation between them are identified and if required necessary controlling measures may be taken.
- **Reporting to the Management :** Cost accounting reports to the management periodically which may be monthly, quarterly or half yearly. According to the reports of the cost accounting, the management takes necessary decisions.

1.1.4 Scope of Cost Accounting

The scope of cost accounting is very wide. There are lots of techniques, tools, procedures, processes, programs are used in cost accounting for calculating cost and its control. But basically, we divide its scope within three major parts.



1. Cost Ascertainment

In this region of cost accounting, cost accounting collects product's material, labour and overhead cost and try to calculate total and per unit cost of product. This total cost calculation will be based on historical or standard or estimated basis. After this, cost accountant will use any method of costing like specific order costing, operation costing, and direct costing technique. These techniques and methods may be used for calculating different nature products in same organization.

2. Cost Records

In this part of cost accounting, cost accountant maintains cost books, vouchers, ledgers, reports and other cost related documents for future comparison and reference. It will also be under the scope of cost accounting.

3. Cost Control

This is the end boundary of cost accounting scope. In this division, cost accountant used different techniques and methods for controlling the cost. Save One Rupees in the cost of product means we have earned one rupees in the production of goods. So, Cost accountant uses budgetary control, standard costing, break even point analysis and many other techniques for controlling the cost.

1.1.5 Significance / Importance of Cost Accounting to Business Concerns

Management of business concerns expects from Cost Accounting, a detailed cost information in respect of its operations to equip their executives with relevant information required for planning, scheduling, controlling and decision making. To be more specific, management expects from cost accounting - information and reports to help them in the discharge of the following functions :

(a) Control of material cost

Cost of material usually constitute a substantial portion of the total cost of a product. Therefore, it is necessary to control it as far as possible. Such a control may be exercised by (i) Ensuring un-interrupted supply of material and spares for production. (ii) By avoiding excessive locking up of funds/capital in stocks of materials and stores. (iii) Also by the use of techniques like value analysis, standardization etc. to control material cost.

(b) Control of labour cost

It can be controlled if workers complete their work within the standard time limit. Reduction of labour turnover and idle time to help us in control labour cost.

(c) Control of overheads

Overheads consists of indirect expenses which are incurred in the factory, office and sales department ; they are part of production and sales cost. Such expenses may be controlled by keeping a strict check over them.

(d) Measuring efficiency

For measuring efficiency, Cost Accounting department should provide information about standards and actual performance of the concerned activity.

(e) Budgeting

Now-a-days detailed estimates in terms of quantities and amounts drawn up before the start of each activity. This is done to ensured that a practical course of action can be chalked out and the actual performance corresponds with the estimated or budgeted performance. The preparation of the budget is the function of Costing Department.

(f) Price determination

Cost accounts should provide information, which enables the management to fix remunerative selling prices for various items of products and services in different circumstances.

(g) Curtailment of loss during the off-season

Cost Accounting can also provide information, which may enable the reduction of overhead, by utilizing idle capacity during the off-season or by lengthening the season.

(h) Expansion

Cost Accounts may provide estimates of production of various levels on the basis of which the management may be able to formulate its approach to expansion.

(i) Arriving at decisions

Most of the decisions in a business undertaking involve correct statements of the likely effect on profits. Cost Accounts are of vital help in this respect. In fact, without proper cost accounting, decision would be like taking a jump in the dark, such as when production of a product is stopped.

1.1.6 Advantages of Cost Accounting

1. Advantages to the management

A good costing helps the management in classifying, controlling the costs, to take vital business policy decisions, to use standards in making estimates, to use the limited resources effectively for maximum output, to undertake cost audit and to fix remunerative selling price of various products.

2. Advantages to workers

It enables to examine the relative efficiency of workers which facilitates the introduction of suitable plans of wage payment.

3. Advantages to Investors

It enables the investors to judge the financial strength of the company for their investment. Thus, costing information avoids the risk for the investment.

4. Advantages to Government

It helps the Government in preparing national plans to economic development. For e.g. :- Assessment of excise duty, income tax, exports and imports policies etc.

5. Advantages to Public Enterprises

It measures the efficiency and profitability of the undertaking to justify its running in the public sector.

6. Advantages to Consumers

Since cost accounting aims at reducing the cost of production, the consumers can get the goods in the form of lower prices.

1.1.7 Limitations of Cost Accounting

1. Lack of Uniform Procedure

As costing contains estimates, two cost accountants may arrive two different results from the same information. Hence cost accounting results can be taken as mere estimates.

2. Very Expensive

As the installation cost of costing is very expensive only big business concerns use costing.

3. Absence of a Ready Made System

There is no stereo typed costing system applicable to all industries and even firms in the same industry.

4. Varied Cost Concepts

Since different costs are used for different purposes, no one cost is suitable for all purposes. For ex :- Actual costs are different from standard costs and both are different from estimated costs.

5. Role of Management

The usefulness of cost accounting is restricted to the ability and willingness of management to take decisions based on information received.

1.2 Concept of Cost

The term cost has a wide variety of meanings. Different people use this term in different senses for different purposes. In common use, the word cost means price. For example, in electronic shop, you may ask like what is the cost of this TV? But for our purpose cost is not the same as price. In management terminology, the term cost refers to "expenditures" and not the "price".

To understand the concept of cost very clear, let us study the following definitions about cost.

According to the terminology of British Institute of Cost and Works Accounts (ICWA), "cost is the amount of expenditure (actual or notional) incurred on or attributable to a given thing".

In the words of W.M.Harper, "cost is the value of economic resources used as a result of producing or doing the things costed".

The AICPA Committee refers cost as "the amount measured in money of cash expanded or other property transferred, capital stock issued, service performed, or a liability incurred, in consideration of goods or services received or to be received".

Thus, it is clear from the above definitions that the meaning and concept of cost is very broad and flexible. Therefore, one can draw the following points from the above definitions.

- Cost represents that portion of acquisition price of goods, property or services, which have been deferred or not yet utilized in connection with the realization of revenues.
- Expenses are all expired costs, which are deductible from revenues.
- Cost is the amount of expenditure that incurred during a course of action.

1.3 Elements of Costs

There are three broad elements of cost :

(a) Material

(b) Labour

(c) Expenses

(a) Material

The substance from which the product is made is known as material. It may be in a raw or a manufactured state. It can be direct as well as indirect.

Direct Material : All material which becomes an integral part of the finished product and which can be conveniently assigned to specific physical units is termed as "Direct Material".

Following are some of the examples of direct material :

i) All material or components specifically purchased, produced or requisitioned from stores.

ii) Primary packing material (e.g. – cartoon, wrapping, cardboard, boxes etc.)

iii) Purchased or partly produced components.

Direct material is also described as raw-material, process material, prime material, production material, stores material, constructional material etc.

Indirect Material : All material which is used for purposes ancillary to the business and which cannot be conveniently assigned to specific physical units is termed as "Indirect Material".

Consumable stores, oil and waste, printing and stationery etc. are a few examples of indirect material Indirect material may be used in the factory the office or the selling and distribution division.

(b) Labour

For conversion of materials into finished goods, human effort is needed, such human effort is called labour. Labour can be direct as well as indirect.

Direct labour : Labour which takes an active and direct part in the production of a particular commodity is called labour. Direct labour costs are, therefore specially and conveniently traceable to specific products.

Direct labour is also described as process labour, productive labour, operating labour, manufacturing labour, direct wages etc.

Indirect labour : labour employed for the purpose of carrying out tasks incidental to goods or services provided, is indirect labour such labour does not alter the construction, composition or condition of the product. It cannot be practically traced to specific units of output wages of store – keepers, foreman, time – keepers, directors, fees, salaries of salesmen, etc. are all examples of indirect labour costs.

Indirect labour may relate to the factory the office or the selling and distribution division.

(c) Expenses

Expenses may be direct or indirect.

(i) **Direct expenses :** These are expenses which can be directly, conveniently and wholly allocated to specific cost centers or cost units. Examples of such expenses are: hire of some special machinery required for a particular contract, cost of defective work incurred in connection with a particular job or contract etc.

Direct expenses are sometimes also described as "chargeable expenses".

(ii) Indirect expenses : These are expenses which cannot be directly, conveniently and wholly allocated to cost centers or cost units.

Overheads : It is to be noted that the term overheads has a wider meaning than the term indirect overheads include the cost of indirect material, indirect labour besides indirect expenses.

Indirect expenses may be classified under the following three categories

(a) Manufacturing (works, factory or production) expenses

Such indirect expenses which are incurred in the factory and concerned with the running of the factory or plant are known as manufacturing expenses. Expenses relating to production management and administration are included there in. Following are a few items of such expenses:

Rent, rates and insurance of factory premises, power used in factory building, plant and machinery etc.

(b) Office and Administrative expenses

These expenses are not related to factory but they pertain to the management and administration of business, such expenses are incurred on the direction and control of an undertaking example are :- office rent, lighting and heating, postage and telegrams, telephones and other charges; depreciation of office building, furniture and equipment, bank charges, legal charges, audit fee etc.

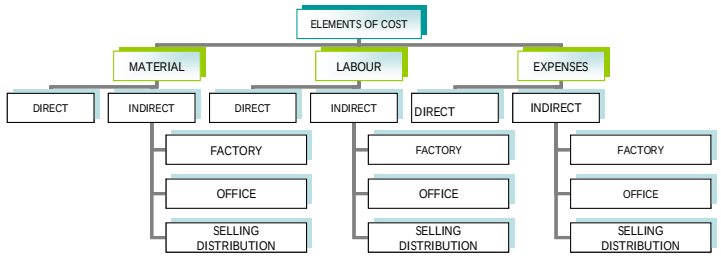
(c) Selling and Distribution Expenses

Expenses incurred for marketing of a commodity, for securing orders for the articles, dispatching goods sold, and for making efforts to find and retain customers are called selling and distribution expenses examples are:-

Advertisement expenses cost of preparing tenders, traveling expenses, bad debts, collection charges etc.

Warehouse charges packing and loading charges, carriage outwards, etc.

The above classification of different elements of cost can be presented in the form of the following chart :



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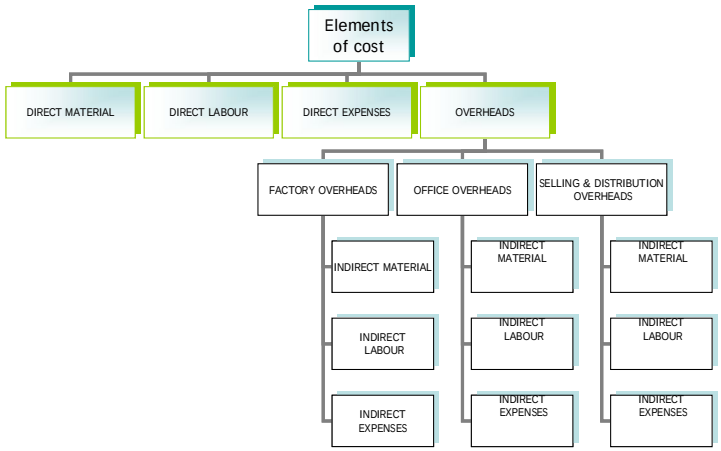


1.4 COMPONENTS OF TOTAL COSTS

1. Prime cost

It consists of costs of direct material, direct labour and direct expenses. It is also known as basic, first or flat cost.

2. Factory cost

It comprises of prime cost and in addition works of factory overheads which includes costs of indirect material, indirect labour and indirect expenses of the factory. The cost is also known as works cost, production or manufacturing cost.

3. Office cost

If office and administrative overheads are added to factory cost office, cost is arrived & this is also termed as administrative cost or the total cost of production.

4. Total cost

Office cost or total cost of production selling and distribution overheads are added to the total cost of production to get the total cost or the cost of sales.

Cost of sales or total cost. The various components of total cost can be depicted through the help of the following :

Components of Total Cost

Direct material plus Direct labour plus Direct expenses	Prime cost or Direct cost or First cost
Prime cost plus manufacturing works	Works cost or factory or production cost or overheads costs
Work cost plus office and Administrative overheads	Office cost or total cost of production
Office cost plus selling And distribution overheads	Cost of sales or total cost

Adjustments for Inventories

The following adjustments may have to be made for inventories of raw materials, work – in – progress and finished goods while computing the different components of cost :

i) Direct Material Consumed = Opening stock of Direct material + Purchases of Direct material – Closing stock of Direct material

ii) Works Cost = Gross works cost + Opening work in – progress – Closing work – in progress

iii) Cost of production of goods sold = cost of production + Opening stock of finished good – Closing stock

PROBLEMS

Example 1

Calculate prime cost from the following information :

Direct material - Rs. 40,000, Direct labour - Rs. 30,000 Direct expenses - Rs. 25.000

Solution :

Prime cost = Direct Material + Direct labour + Direct expenses

= Rs. 40,000 + Rs.30, 000 + Rs. 25,000

= Rs. 95,000

Example 2

Calculate prime cost from the following information:-

Opening stock of raw material = Rs. 12,500

Purchased raw material = Rs. 75,000

Expenses incurred on raw material = Rs. 5,000

Closing stock of raw material = Rs. 22,500

Wages Rs. 47,600 Direct expenses Rs. 23,400

Solution :

Calculation of raw material consumed:-

Raw material consumed = Opening stock of material + purchases of Raw material + expenses incurred on raw material - closing stock of raw material

= Rs 12,500 + Rs 75,000 + Rs 5,000 – Rs 22,500

= Rs. 92,500 – Rs 22,500

= Rs. 70,000

Prime cost = Raw material consumed + Direct labour + Direct expenses

= Rs 70,000 + Rs 47,600 + Rs 23,400

= Rs 1, 41,000

OR

It can be shown in vertical form such as cost sheet

Particular	Details (Rs)	Amount (Rs)
Opening stock of raw material	12,500	
Add:- Purchase	7,500	
Add:- Expenses incurred on purchases	5,000	
Raw material available	92,500	
Less :- closing stock of raw material	22,500	
Raw material consumed		70,000
Add:- Direct wages or labour		47,600
Add:- Direct expenses		23,400
Prime cost		1,41,000

Example 3

Calculate works cost or factory cost from the following details:-

Raw material consumed = Rs 50,000
Direct wages = Rs20, 000
Direct expenses = Rs 10,000
Factory expenses 80% of direct wages
Opening stock of work in progress = Rs 15,000
Closing stock of work in progress = Rs 21,000

Solution :

Calculation of factory cost

Particular	Amount (Rs)	Amount (Rs)
Direct material consumed	50,000	
Add:- Direct wages	20,000	
Add:- Direct Expenses	10,000	
Prime cost		80,000
Add:- Factory expenses		16,000
Current manufacturing cost		96,000
Add:- Opening stock of work in progress		15,000
Total goods processed during the period		1,11,000
Less:- Closing sock of work in progress		21,000
Factory cost or work cost		90,000

Example 4

Calculate cost of production from the following information:-

Raw material purchased = Rs 42,500
Freight paid = Rs 5,000
Labour charges = Rs 12,500
Direct expenses = Rs 10,000
Factory overhead 80% of Direct labour charges
Administrative overhead = 10% of work cost

	Opening stock	Closing stock
Raw material	8,000	10,000
Work in progress	7,500	9,000

Solution :

Calculation of cost of production :

Particular	Amount (Rs)	Amount (Rs)
Material purchased	42,500	
Add:- freight	5,000	
Total cost of material purchased	47,500	
Add:- Opening stock of Raw material	8,000	
Material available for consumption	55,500	
Less:- Closing stock of Raw material	10,000	
Raw material consumed	45,500	
Add:- Direct labour charges	12,500	
Add:- Direct expenses	10,000	
Prime cost		68,000
Add:- Factory overhead		10,000
Current manufacturing cost		78,000
Add:- Opening stock of work in progress		7,500

Total goods processed during the period	85,500
Less:- Closing stock of work in progress	9,000
Factory cost	76,500
Add:- Administrative overhead	7,650
Cost of production	84,150

1.5 CLASSIFICATION OF COST

Costs may be classified in various ways to serve different purposes. Some of the important classifications are as under :-

1. By elements.
2. As direct or indirect.
3. By functional divisions.
4. By departments.
5. By product.
6. As variable, semi-variable or fixed.
7. As expenditure being capital or revenue.

1. Classification by Elements

The important elements of cost are material, labour and expense. This classification reveals as how the cost of a product is made up and what is the importance of each element in the total cost of a product. This is also useful for valuation of stock of work-in-process. This classification will disclose the scope for economy which can be effected with regard to different elements constituting the cost of a product.

2. Classification as Direct and Indirect

Any expenditure that can be identified with a particular unit of cost is known as direct expenditure. Any other expenditure which cannot be so identified is indirect expenditure. The cloth in the manufacture of shirts is a direct item of cost but the rent paid by the tailor for tailoring shop is indirect as that expenditure cannot be directly charged to any particular shirt. The importance of this classification lies in the fact that direct costs of a product or activity can be accurately determined, while indirect costs have to be apportioned on certain assumptions as regards their incidence.

3. Classification by Functional Divisions

This means classification of costs according to the principal functional divisions such as production, administration, selling and distribution. This classification facilitates the assessment of the efficiency and thus leads to better control over them. It enables the assessment of manufacturing profit as distinct from the trading profit.

4. Classification by Departments

Costs may be classified according to departments in a manufacturing concern. There may be a number of departments such as production departments in a manufacturing concern. Production departments engage directly in production while service department render some auxiliary service to the production departments. This classification enables the exercise of better control over them. It enables the application of different methods and rates for recovery of the different departmental overheads thus ensuring greater accuracy in costing.

5. Classification by Product

When a factory is producing different types of products, it becomes necessary to classify the costs according to the products. This classification will reveal the profitability of the different products and will enable the management to take steps to control the cost and fix prices.

6. Classification according to the cost behaviour variable

The behavior of costs in relation to the volumes of production or sales provides another basis of classification of costs. Costs which vary in direct proportion to changes in the volume of output or sales are known as variable costs.

7. Classification according to the expenditure being of a capital

Capital expenditure refers to the expenditure on those items which are not consumed in one use but lasts over several uses. The revenue expenditure means expenditure on items which are consumed in one use only.

1.5.1 Classification of Cost based on their Nature

We come across three classes, if indirect expenses are classified element wise:

1. Indirect Materials
2. Indirect labour
3. Indirect expenses.

The following are some examples:

1. Indirect materials

Factory: Stores which are consumable; Canteen food stuff; materials for first aid; materials for fire extinguishing etc.

Administration: Cost of stationery; expenses incurred in connection with canteen food stuff; cost incurred for the purpose of cleaning of materials etc.

Selling & Distribution: Expenses incurred with respect of packing of materials; stationery expenses; fuel & lubricating oil charges incurred in respect of delivery van etc.

2. Indirect Labour

Factory: Expenses incurred for payment of salary to the works manager, supervisor, foreman etc.; wages incurred for the purpose of payment made to the indirect workers, stores staff, maintenance & repairs staff etc.; wages incurred for payment to the personnel of the time office & pay-roll department etc.

Administration: Expenses incurred for the purpose of payment of salary for all the administrative function's employees, starting from the managing director to sweeper; remuneration paid to the directors etc.

Selling & Distribution: Expenses incurred for the payment of salary of the staff of the sales office & for the salary of the distribution men.

3. Indirect Expenses

Factory: Expenses for the purpose of repairs & maintenance; payment of rent, rates & taxes; charges in respect of insurance; depreciation; expenses incurred with respect to stores, other than salaries paid to the repair staff, maintenance staff & stores staff etc.

Administration: All expenses incurred in connection with general administration other than the cost of the materials used & expenses regarding salary. Examples are depreciation; printing charges; rent, rates & taxes payment; cost of postage etc.

Selling & Distribution: Expenses relating to advertisement & exhibition; cost incurred in respect of market research; payment of rent for godown ; insurance charges; depreciation etc.

1.5.2 Classification of Cost based on their Functions

Functionally, costs can be classified under the following heads :

(a) Prime Cost : It consists of the costs of direct materials that go into the product, the costs of direct labour and direct expenses. It is also known as direct cost or first cost.

(b) Factory Cost : It consists of prime cost plus factory overhead or works expenses or factory on cost. Factory cost is also known as works cost, production cost or manufacturing cost.

(c) Cost of Production : Also called office cost, administration cost or gross cost of production, it consists of factory cost plus office and administrative expenses.

(d) Total Cost or Cost of Sales : It comprises cost of production plus selling and distribution overheads.

1.5.3 Classification of costs based on their Behaviour

On the basis of behaviour or variability, costs may be classified as :

(a) Variable Costs : Costs that vary almost in direct proportion to the volume of production are called variable costs. The examples of such costs are direct material, direct labour and direct chargeable expenses, such as electric power, fuel, etc.

(b) Fixed Costs : Costs which do not vary with the level of production are known as fixed costs. These costs are called fixed costs because these remain constant irrespective of the level of output. It must, however, be noted that fixed costs do not remain constant for all times. In fact, in the long run all costs have a tendency to vary. Fixed costs remain fixed upto a certain level of production.

(c) Semi-variable Costs : Those costs which are partly fixed and partly variable are called semi-variable costs. These costs vary with the level of production but not in direct proportion to the level of production. The examples of such costs are depreciation of machinery, maintenance of equipment, administrative costs, etc. The Cost Behaviour has been discussed in detail latter in this chapter.

1.5.4 Classification of Costs for Controllability and Decision Making

On the basis of Controllability and Decision Making: Based on the managerial decision making and controllability the classifications are as follows:

(a) Controllable Cost

(b) Uncontrollable Cost

(c) Sunk Cost

(d) Opportunity Cost

(e) Replacement Cost

(f) Conversion Cost

(a) Controllable Costs : Controllable Costs are the costs which can be influenced by the action of a specified number of an undertaking. Controllable Costs incurred in a particular responsibility centre which is influenced by the action of the executive heading. For example, direct materials and indirect materials.

(b) Uncontrollable Costs: Uncontrollable Costs are those costs which cannot be influenced by the action of a specified number of an undertaking. In fact, no cost is controllable; it is only in relation to a particular individual that may specify a particular cost to either controllable or non-controllable. For example, rent and rates.

(c) Sunk cost: These are historical costs which were incurred in the past and are not relevant to the particular decision making problem being considered. While considering the replacement of a plant, the depreciated book-value of the old asset is irrelevant as the amount is a sunk cost which is to be written-off at the time of replacement. Unlike incremental or decremental costs, sunk costs are not affected by increase or decrease of volume. Examples of sunk cost include dedicated fixed assets, development cost already incurred.

(d) Opportunity Cost: Opportunity cost means the cost of forgoing or giving up an opportunity. It is the notional value of going without the next best use of time, effort and money. These indicate the income or potential benefits sacrificed because a certain course of action has been taken. An example of opportunity costs is the market value forgone or sacrificed when an old machine is being used.

(e) Replacement Cost: Such expenses may be incurred due to factors like change in method of production, an addition or alteration in the factory building, change in flow of production etc. All such expenses are treated as production overheads; when amount of such expenses is large, it may be spread over a period of time.

(f) Conversion Cost: Conversion costs are those costs which are incurred while converting materials into semi-finished or finished goods. It is the aggregate of direct wages, direct expenses and overhead costs of converting raw materials into finished products.

1.6 Cost Sheet

Cost sheet is a document which provides for the assembly of the estimated detailed cost in respect of a cost centre or a cost unit. It is a detailed statement of the elements of cost arranged in a logical order under different heads. It is prepared to show the detailed cost of the total output for a certain period. It is only a memorandum statement and does not form part of the double entry system. Additional columns can be provided to indicate cost per unit at different stages of production or to enable comparison to be made of the current costs with that of historical costs.

1.6.1 Objectives of Cost Sheet

The cost sheet is prepared with the following objectives:-

1. It ascertains the total cost and cost per unit for a particular period.
2. It enables the management to fix up sale price of products.
3. It helps to present a comparative study of current costs with the costs of the corresponding period.
4. The management can identify the causes of inefficiencies and wastages and the management can take corrective measures.
5. It provides management with suitable information for management control.
6. It also helps the management considerably in formulating suitable and definite production policy.
7. Cost sheet enables the businessman to submit quotation against tenders.

1.6.2 Advantages of Cost Sheet

The main advantages of a cost sheet are :

i) It indicates the break-up of the total cost by elements, i.e. material, labour, overheads, etc.

ii) It discloses the total cost and cost per unit of the units produced.

iii) It facilitates comparison.

iv) It helps the management in fixing selling prices.

v) It acts as a guide to the management and helps in formulating production policy.

vi) It enables to keep control over cost of production.

vii) It helps the management in submitting quotations or preparing estimates for tenders.

viii) It is a simple and useful medium of communication of costs to various levels of management.

1.6.3 Specimen of a Cost Sheet

Cost Sheet for the period..... (Production .....Units).

		Total Cost Rs.	Cost per Unit Rs.
1)	Direct Materials :		
	Opening Stock of raw materials		
	Add: Purchases of raw materials		
	Less: Closing stock of raw materials		
2)	Direct Labour		
3)	Direct Expenses		
A)	Prime Cost		
4)	Add: Works overheads or factory overheads		
B)	Works or Factory Cost		
5)	Add: Office and Administration overheads		
C)	Cost of Production		
6)	Add: Selling and Distribution overheads		
D)	Total Cost or Cost of Sales		

1.6.4 Preparation of Cost Sheet

The preparation of the cost sheet or statement of cost requires understanding of the treatment of the following items :

1. Stock of Raw Materials

While preparing a cost sheet, it is necessary to determine the cost of raw material consumed. If the opening stock of raw materials, purchase of raw materials during the period and closing stock of raw material at the end of the period are given, then the cost of raw materials consumed is calculated as follows:

Calculation of Raw Materials Consumed

Opening stock of raw materials	xxx
Add: Purchases of raw materials	x x x
	xxx
Less : Closing stock of raw materials	xxx
Cost of raw materials consumed	xxx

2. Stock of Work-in-Progress

Work-in-progress refers to the semi-finished goods on which some work has been done but which are not yet complete at the end of the period. As such these goods are not yet available for state. The stock of work-in-progress may be valued at prime cost or factory/work cost basis, but generally, it is valued on the basis of work cost. The adjustment for the stock of work-in-progress valued at works cost should be made as follows:

Adjustment of the Stock of Work-in-Progress

	Rs.
Prime cost	xxx
Add: Factory overhead	xxx
Add : Opening stock of work-in-progress	xxx
	xxx
Less : Closing stock of work-in-progress	xxx
Factory or works cost	xxx

3. Stock of Finished Goods

Stock of finished goods refers to the stock of products on which all factory' work has been completed. Thus, it is valued at the cost of completed production. If opening and closing stocks of finished goods are given, then the following adjustment should be made while calculating cost of goods sold :

Adjustment of the Stock of Finished Goods

	Rs.
Cost of production	xxx
Add: Opening stock of finished goods	xxx
Less : Closing stock of finished goods	xxx
Cost of goods sold	xxx

4. Carriage Inward or Carriage on Raw Materials Purchased

Carriage inward which is incurred on bringing the raw material purchased should be added while calculating the cost of raw materials consumed as below :

	Rs.
Opening stock of raw materials	x x x
Add : Purchases of raw materials	xxx
Add: Carriage inward	xxx
Less : Closing stock of raw materials	xxx
Cost of raw materials consumed	xxx

5. Scrap of Materials

Scrap is discarded material having some value which is usually either disposed off without further treatment or is introduced into the production process in the place of raw materials. If the value of scrap is negligible, then it is credited to profit and loss account as an income.

The cost of production bears the cost of scrap because total cost is not reduced by the amount of scrap. However, in case the value of scrap is significant, then it

is deducted from the cost of material consumed or factory overhead/cost depending upon the stage of scrap. If the scrap materials occur in raw condition stage, then the net amount realised from the sale of scrap should be deducted from the cost of materials used. But, if the scrap is obtained in the course of manufacturing process, then the net amount realised from the sale of scrap should be deducted from the factory overhead or factory cost.

6. Items Excluded from Costs

The items of expenses, losses or incomes which are related to capital assets, appropriation of profits, amortization of fictitious or intangible assets, abnormal gains and losses or items of purely financial nature do not form part of the costs and these are excluded from cost accounts.

The examples of such items include - loss on sale of building or machinery, interest on capital, discount on issue or redemption of shares or debentures, expenses relating to previous period, cash discounts, bad debts, damages payable, penalties and fines, interest or dividend received on investments, transfer fees received, profit on sale of fixed assets, appropriation of profits such as income-tax, dividend paid, transfer of profits to reserves or funds, donations and charities, excess provision for depreciation on fixed assets, amortization of fictitious or intangible assets such as goodwill written off, preliminary expenses written off, patents, trade marks and copyrights written off, capital issue expenses, underwriting commission, loss on issue of shares and debentures written off, etc. Thus, it should be noted that such items are not taken into consideration (excluded) while preparing a cost sheet.

PROBLEMS

Problem No. 1

From the following particulars of a manufacturing firm, prepare a statement of cost :

Stock of materials on January 1, 2014	20,000
Purchases of raw materials in January, 2014	5,50,000
Stock of finished goods on January, 1,2014	25,000

Productive wages	2,50,000
Finished goods sold	12,00,000
Works overhead charges	75,000
Office and general expenses	50,000

Solution :

Statement of Cost

(For the period ending on 31st January, 2014)

		Rs.	Rs.
	Opening stock of raw materials	20,000	
	Add: Purchases of raw materials	5,50,000	
		5,70,000	
	Less: Closing Stock of raw materials	70,.000	
	Cost of raw materials used		5,00,000
	Add: Productive wages		2,50,000
a)	Prime cost		7,50,000
	Add: Works overhead charges		75,000
b)	Works Cost or Factory Cost		8,25,000
	Add: Office and general expenses		50,000
c)	Cost of Production		8,75,000
	Add : Opening stock of finished goods		25,000
			9,00,000
	Less : Closing stock of finished goods		30,000
d)	Cost of goods sold		8,70,000
	Add: Selling and Distribution expenses		3,00,000
e)	Cost of Sales		11,70,000
	Profit		30,000
	Sales		12,00,000

Problem No. 2

Mr. X furnishes the following data relating to the manufacture of a standard product during the month of April, 2014 :

	Rs.
Raw materials consumed	60,000
Direct labour charges	36,000
Machines hours worked	3,600
Machine hour rate	Rs. 5
Administrative overheads	20% on works cost
Selling overheads	Re. l/-perunit
Units produced	10,000
Unit sold	9,000 at Rs. 20 per unit

You are required to prepare a cost sheet from the above, showing :

a) Cost per unit

b) Profit per unit sold and profit for the period.

Solution :

Cost Sheet

for the month of April, 2014

		Rs.	**Rs. (per unit)**
	Raw material consumed	60,000	6.00
	Add : Direct labour charges	36,000	3.60
a)	Prime Cost	96,000	9.60
	Add: Factory overheads (3,600 x 5)	18,000	1.80
b)	Works Cost	1,14,000	11.40
	Add: Administrative overheads(20% of work cost)	22,800	2.28
c)	Cost of Production	1,36,800	13.68
	Less: Closing stock of finished goods' (1,000 x 13.68)	13,680	
d)	Cost of Goods Sold	1,23,120	13.68
	Add: Selling overheads (9,000 x 1)	9,000	1.00
e)	Cost of Sales	1,32,120	14.68
f)	Sales (9,000x20)	1,80,000	20.00
	Profit	47,880	5.32

Problem No. 3

The following information has been obtained from the records of Excel Manufacturing Limited for the period from March 1, 2014 to March 31, 2014 :

	Rs.
Cost of raw materials in stock as on 1st March, 2014	15,000
Raw materials purchased during the month	2,25,000
Wages paid	1,00,000
Wages outstanding	15,000
Factory overheads	46,000
Work-in-progress on 1st March, 2014	6,000
Raw materials in stock on 31 st March, 2014	12,500
Work-in-progress as on 31 st March, 2014	7,500
Opening stock of finished goods	30,000
Closing stock of finished goods	27,500
Selling and distribution overheads	10,000
Sales	4,50,000
Administration overheads	15,000

You are required to prepare a statement showing the cost of goods manufactured and cost of goods sold.

Solution :

Excel Manufacturing Limited
Statement of Cost
(for the month of March, 2014)

	Rs.	Rs.
Cost of raw materials consumed :		
Stock of raw materials on 1st March, 2014	15,000	
Add: Purchase of raw materials during the month	2,25,000	
	2,40,000	
Less : Stock of raw materials on 31st March, 2014	12,500	2,27,500
Wages paid	1,00,000	
Add: Wages outstanding	15,000	1,15,000

Prime Cost	3,42,500
Factory overheads	46,000
	3,88,500
Add: Work-in-progress as on 1st March, 2014	6,000
	3,94,500
Less : Work-in-progress as on 31st March, 2014	7,500
Works Cost	3,87,000
Administration overheads	15,000
	4,02,000
Cost of Production	30,000
Add: Opening stock of finished goods	4,32,000
Less : Closing stock of finished goods	27,500
Cost of Goods Sold	4,04,500
Add: Selling and distribution overheads	10,000
Cost of Sales	4,14,500
Sales	4,50,000
Profit	35,500

Problem No. 4

The following extract of costing information relates to commodity X for the half year ended 30th June, 2014 :

Stock on 1st January, 2014 :	22,000
Raw materials	17,600
Finished products (1,600 tonnes)	
Stock on 30th June, 2014 :	
Raw materials	24,464
Finished products (3,200 tonnes)	35,200
Purchase of raw materials	1,32,000
Direct wages	1,10,000
Rent, rates, insurance and works on cost	44,000
Carriage inward	1,584
Work-in-progress as on 1st January, 2014	5,280
Work-in-progress as on 30th June, 2014	17,600
Cost of factory supervision	8,800
Sales—Finished products	3,30,000

Advertising, discount allowed and selling cost 75 paise per ton sold. 25,600 tonnes of commodity was produced during the period.

You are required to ascertain :

(a) the value of raw materials used ;

(b) cost of output for the period,

(c) cost of turnover for the period ;

(d) net profit for the period ; and

(e) net profit per tonne of the commodity sold.

Solution :

Statement of Cost

(Period : Six months ended 30th June, 2014) (1Output : 25,600 tons)

	Rs.	Rs.
Cost of raw materials consumed :		
Opening stock of raw materials	22,000	
Add: Purchase of raw materials	1,32,000	
Add: Carriage inward	1,584	
	1,55,584	
Less : Closing stock of raw-materials	24,464	
a) Value of raw materials used		1,31,120
Direct Wages		1,10,000
Prime Cost		2,41,120
Factory overheads :		
Rent, rates, insurance and works on cost	44,000	
Cost of factory supervision	8,800	52,800
		2,93,920
Add: Work-in-progress as on 1st January, 2014		5,280
		2,99,200
Less : Work-in-progress as on 30th June, 2014		17,600
b) Work Cost (Cost of Output)		2,81,600

Cost of output per tonne = $\frac{2,81,600}{25,600}$ per tonne.

Statement of Profit

	Quantity (Tonnes)	Amount (?)
Works Cost (Cost of output)	25,600	2,81,600
Add: Opening stock of finished products	1,600	17,600
	27,200	2,99,200
Less : Closing stock of finished products	3,200	35,200

Cost of Goods Sold	24,000	2,64,000
Selling and distribution overheads :		
Advertising, discount allowed and selling cost @ 75		
paise per tonne of output sold for 24,000 tonnes.		18,000
		2,82,000
c) Cost of Sales (Turnover)		
Sales		3,30,000
d) Net Profit for the period		48,000

e) Net Profit per tonne of the commodity sold

$$= \frac{48,000}{24,000} = \text{Rs. 2 per tonne}$$

Problem No. 5

The directors of a manufacturing business require a statement showing the production results of the business for the month of March, 2014. The cost accounts reveal the following information :

Stock on hand 1st March, 2014	
Raw material	25,000
Finished goods	17,360
Stock on hand, 31st March, 2014	
Raw materials,	26,250
Finished goods	15,750
Purchase of raw materials	21,900
Work-in-progress, 1st March 2014	8,220
Work-in-progress, 31 st March 2014	9,100
Sale of finished goods	72,310
Direct wages	17,150
Non-productive wages	830
Works expenses	8,340
Office and administrative expenses	3,160
Selling and distributive expenses	4,210

You are required to construct the statement so as to show (a) the value of materials consumed; (b) the total cost of production ; (c) the cost of goods sold ; (d) the gross profit on goods sold and (e) the net profit for the month.

Solution :

Statement of Cost
(for the month of March, 2014)

		Rs.	Rs.
Value of materials consumed :			
Stock of raw materials in hand on 1st March, 2014		25,000	
Add: Purchase of raw materials		21,900	
		46,900	
Less : Stock of raw materials in hand on 31 st March, 2014		26,250	
a)	**Value of Materials Consumed**		20,650
	Direct wages		17,150
	Prime Cost		37,800
	Factory overheads :		
	Non-productive wages	830	
	Works expenses	8,340	9,170
			46,970
Add: Opening work-in-progress (1 st March, 2014)			8,220
			55,190
Less : Closing work-in-progress (31 st March, 2014)			9,100
	Works Cost		46,090
	Office and administrative expenses		3,160
b)	Total Cost of Production		49,250
	Add: Opening stock of finished goods		17,360
			66,610
	Less : Closing stock of finished goods		15,750
c)	Cost of Goods Sold		50,860

	Sales		72,310
d)	Gross Profit on Goods Sold		21,450
e)	Net Profit on Goods Sold :		
	Cost of goods sold	50,860	
	Add: Selling and distribution expenses	4,210	
Cost of Sales		55,070	
	Sales	72,310	
	Net Profit (for the month)	17,240	

Problem No. 6

Work out in cost sheet form the unit cost of production per ton of special paper, manufactured by a paper mill in December from the following data:

Direct materials :

Paper Pulp — 500 tons @ Rs. 50 per ton

Other materials — 100 tons @ Rs. 30 per ton

Direct labour :

80 skilled men @ Rs. 3 per day for 25 days

40 unskilled men @ Rs. 2 per day for 25 days

Direct expenses :

Special equipment Rs. 3,000

Special dyes Rs. 1,000

Works overhead :

Variable @ 100% and

Fixed @ 60% on direct wages

Administrative overhead : @ 10% and

Selling and distribution overhead @ 15% on works cost

400 tons of special paper was manufactured and ? 800 was realised by the sale of waste material. The scrap value of special equipment after utilisation in manufacture is nil.

Solution :

Cost Sheet

(for the month of December ...)

	Output: 400 tons	
	Total Cost (Rs.)	**Cost per Ton (Rs.)**
Direct materials :		
Paper pulp 500 tons @ Rs. 50 per ton	25,000	62.50
Other materials 100 tons @ Rs. 30 per ton	3,000	7.50
	28,000	70.00
Less: Sale of waste material	800	2.00
Value of direct materials consumed	27,200	68.00
Direct labour:		
80 skilled men @ Rs. 3 per day for 25 days	6,000	15.00
40 unskilled men @ 12 per day for 25 days	2,000	5.00
Direct expenses :		
Special equipment	3,000	7.50
Special dyes	1,000	2.50
Prime Cost	39,200	98.00
Works Overhead :		
Variable 100% on direct wages (6,000 + 2,000)	8,000	20.00
Fixed 60% on direct wages	4,800	12.00
Works cost	52,000	130.00
Administrative overhead, 10% of works cost	5,200	13.00
Cost of Production	57,200	143.00
Selling and distribution overhead, 15% on works cost	7,800	19.50
Total Cost	65,000	162.50

1.7 COST UNIT

A cost unit is a standard of measurement of the goods produced or services rendered. It may be a selling unit, a job, batch, contract, process or a unit of service. The Institute of Cost and Management Accountants, London has defined a cost unit as "a unit of quantity of product, service or time (or a combination of these), in relation to which cost may be ascertained or expressed." Thus, a cost unit should be one with which costs can be conveniently associated. Further, it should be simple to understand, unambiguous to define and commonly used.

Cost units may be classified under two categories :

i) **Simple Unit.** It uses a single standard or unit of measurement, e.g., a tonne, quintal, kilogram, gallon, metre, piece, etc.

ii) **Composite or Compound Unit.** It is a combination of two simple units, e.g., per passenger kilometre, tonne kilometre, kilowatt hour, per man room, etc.

Examples of Cost Unit

The following table gives a few examples of cost units.

Name of Industry	Cost Unit
Automobile	Per automobile, **i.e.,** per motor car, bus, truck, etc.
Cement	Per tonne
Collieries	Per tonne
Chemical	Per tonne, pound or kilogram
Cable	Per metre
Construction	Per contract, job or square foot of area
Shipbuilding	Per ship
Cycle	Per cycle
Sugar	Per quintal
Paper	Perream, kilogram
Timber	Per cubic feet
Steel	Per tonne
Mining	Per tonne
Flour mill	Per quintal
Oil	Per litre, gallon
Brewery	Per barrel, bottle or gallon
Brick works	Per thousand bricks
Power	Per kilowatt hour
Water	Per thousand gallons
Transport	Per ton or passenger kilometre
Hospital	Per bed
Hotel	Per bed, room
Fertilizer	Per tonne
Aircraft	Per craft
Textile	Per metre, yards
Television, Computer, Refrigerator	Per machine, set

1.8 COST CENTRE

Costs are identified in relation to cost centres and cost units, and thus, it is essential to understand the meaning of these two terms. According to the Institute of Cost and Management Accountants, London, a cost centre is "a location, person or item of equipment (or group of these) for which costs may be ascertained and used for the purposes of cost control." A cost centre may be an organisational division, an area of activity, a department, a person, machine or item of equipment, an individual worker, a shop in the works, a work bench, etc.

The purpose of establishing cost centres is to identify costs in relation to these centres so that efficiency is evaluated and responsibility may be fixed. Though, establishment of cost centres is fundamental to control costs, it is not possible to lay down a system of cost centres that will suit every organisation. Cost centre in an organisation is established keeping in view the special features of the organisation, convenience of cost accumulation, comparability and control of costs. Types of Cost Centres

Types of Cost Centres

The following are the types of cost centres that are usually found :

1. Production Cost Centre

A production cost centre is one which is directly engaged in converting the raw materials into finished products.

2. Service Cost Centre

A service cost centre is not directly engaged in production but it aids or provides service to production cost centres in carrying out their activities, e.g., power house, boiler house, drawings and designs, repairs and maintenance, etc.

3. Mixed Cost Centre

A mixed cost centre is one which is engaged on both production and service activities either at the same time or at different times. It may be engaged in production activities at some time and on service activities at some other time.

4. Personal Cost Centre

A personal cost centre consists of a person or group of persons, e.g., works manager, foreman, supervisor, storekeeper, etc.

5. Impersonal Cost Centre

An impersonal cost centre consists of a location or item of equipment or group of these, e.g., a machine, department, warehouse, plant, etc.

6. Operation Cost Centre

It consists of the persons and/or machines earning cut similar operations, e.g., persons and machines engaged in machining, welding, painting, galvanising, etc.

7. Process Cost Centre

A process cost centre consists of a specific process or a continuous sequence of operations.

1.9 Cost Unit Vs Cost Centre

The main points of difference between cost centre and cost unit are :

i) Cost are accumulated, recorded and summarised by cost centres, whereas, they are expressed in terms of cost unit. The cost centre is a calculation centre while cost unit is an expression centre.

ii) Cost centre is a basis of classification of cost but cost unit is not used for classifying cost.

iii) Cost centre helps is controlling and monitoring cost while cost unit does not help.

iv) One product may pass through different cost centres, whereas a product generally has only one cost unit in which its costs are expressed.

v) Different firms may have different cost centres but cost unit is usually the same.

vi) The existence of cost centre depends upon the nature and technique of production processes, size and nature of business, while cost unit depends upon final product.

1.10 Cost Estimation and Cost Ascertainment

Cost estimation is an attempt to estimate future cost on the basis of past experiences. Cost managers are interested in analysing past cost behaviour functions primarily because these help them to make more accurate cost predictions about future costs. Better cost predictions help managers make more informed planning and control decisions. There are basically four methods of cost estimation :

i) Industrial engineering method.

ii) Conference method.

iii) Amount analysis method.

iv) Suantitative analysis method using a formal mathematical model.

Cost ascertainment, on the other hand, relates to preparation of a cost sheet or calculating the cost per unit and the total cost incurred for a product during a particular period.

1.11 Cost Allocation Vs Cost Apportionment

Cost allocation is the process of identifying costs with cost centres or cost units. A cost which is directly identifiable to a specific cost centre or unit is allocated to that centre or unit. It is the allotment of whole item of cost to the concerned cost centre or cost unit. On the other hand, cost apportionment is the allotment of proportions of the common items of cost (on the basis of benefit received) to cost centres or cost units.

Cost apportionment is made on some suitable basis such as area occupied, number of workers, asset value, horse power of machines, number of light points, amount of wages, etc. In case of cost allocation, no such suitable base is required as the costs are directly identified to concerned cost centre or cost unit.

1.12 Cost Reduction and Cost Control

A) Cost Reduction

Cost reduction may be defined as the permanent reduction in the unit cost of goods manufactured or services rendered without impairing their quality and suitability for use. The Chartered Institute of Management, London defines cost reduction as "the achievement of real and permanent reduction in the unit cost of goods manufactured or services rendered without imparing their suitability for the use intended or diminution in the the quality of the product."

The definition given above reveals the following characteristics of cost reduction where one should focus :

i) The cost reduction must be real through increased productivity, improved design, better methods or new layout etc.

ii) Cost reduction must be of permanent nature. It should not be temporary or short lived. Temporary reductions in costs due to certain factors such as decrease in prices of raw materials, reduced tax rates etc. do not fall in the preview of cost reduction.

iii) Cost reduction should not impair the quality and suitability of essential characteristics of the products or services. If the quality of the product is declined due to change in raw material etc; it may result in lower cost but cannot be termed as cost reduction in real sense. The cost reduction should, thus, aim at elimination of wastages, increase in productivity and improvement in efficiency. It is a planned and positive approach for the improvement.

B) Cost Control

Cost control is simply the achievement of predetermined costs. In other words it is the function of keeping costs within prescribed limits. The Chartered Institute of Management Accountants, London defines cost control as "the regulation by executive action of the cost of operating an undertaking, particularly where such action is guided by cost accounting." Cost control is exercised through setting standard or target costs and comparing the actuals with the predetermined, planned costs so as to reduce inefficiencies and wastages. Thus, cost control is to compel the actual costs to conform to the planned costs.

It involves :

i) The determination of standard (planned) cost.

ii) The recording of actual cost.

iii) The comparison between predetermined (standard cost and actual cost).

iv) The finding out of variances.

v) The analysis of variances to fix responsibilities

vi) The reporting of variances to find out inefficiency.

vii) The taking of corrective action or measures so that future performance conforms to standards.

viii) The periodical review of standards.

There are many tools used for cost control purposes, the two most popular are standard costing and budgetary control.

1.12.1 Cost Control Vs. Cost Reduction

The term 'cost reduction' is often confused with 'cost control'. But the two terms do not mean the same thing. Cost reduction and cost control are two effective tools of management to improve efficiency but both differ in their concepts and procedures.

The main points of distinction between the two are as follows :

i) Object

The aim of cost control is to achieve the predetermined costs whereas cost reduction aims at real or permanent reduction of costs by adopting new methods, technology etc.

ii) Method

Cost control is concerned with determination of standard costs, ascertaining actual costs, comparing the standard with the actual costs, analysing the variances and taking corrective action for the future. On the other hand, cost reduction is not concerned with maintenance of performance according to predetermined standards.

iii) Nature

Cost control is static in nature in the sense that it is a routine exercise carried out to achieve the fixed predetermined standards, whereas cost reduction is a continuous exercise to reduce costs further on permanent basis.

iv) Approach

Cost control aims to seek adherence to standards, whereas cost reduction challenges the predetermined standards themselves.

v) Function

Cost control is a preventive function, whereas cost reduction is a corrective function.

vi) Phase

Cost reduction begins where cost control ends. It is a more dynamic approach as compared to cost control for improving the efficiency, productivity and elimination of wastages.

1.12.2 Advantages of Cost Reduction and Cost Control

The major advantages of exercising cost reduction and cost control programme are given below :

1. Proper utilisation of resources.
2. Minimising costs.
3. Reasonable prices for customers.
4. Increased profits.
5. Better market position.
6. Increased efficiency.
7. Improved productivity.
8. Higher rate of return on investment
9. Increased capacity to cope competition.
10. Improved employer-employee relationship.

SHORT NOTES

1. Cost accounting

Cost accounting is a process of collecting, analyzing, summarizing and evaluating various alternative courses of action. Its goal is to advise the management on the most appropriate course of action based on the cost efficiency and capability. Cost accounting provides the detailed cost information that management needs to control current operations and plan for the future

2. Cost

Cost may be define as the price of any asset when one company purchases it or it may the expenses for getting services. So, we can say that cost is total amount which is sacrificed for getting the goods, services and assets.

3. Costing

Costing is technique to determine the cost. It involves the process and method to classify and analysis of different expenditures.

4. Cost Accountancy

According to the Institute of Cost and Management Accountants, London, cost accountancy is the application of costing and cost accounting principles, methods, techniques etc., to the science, art and practice of cost control, cost audit and ascertainment of profitability.

5. Prime cost

It consists of costs of direct material, direct labour and direct expenses. It is also known as basic, first or flat cost.

6. Factory cost

It comprises of prime cost and in addition works of factory overheads which includes costs of indirect material, indirect labour and indirect expenses of the factory. The cost is also known as works cost, production or manufacturing cost.

7. Office cost

If office and administrative overheads are added to factory cost office, cost is arrived & this is also termed as administrative cost or the total cost of production.

8. Cost sheet

Cost sheet is a document which provides for the assembly of the estimated detailed cost in respect of a cost centre or a cost unit. It is a detailed statement of the elements of cost arranged in a logical order under different heads. It is prepared to show the detailed cost of the total output for a certain period. It is only a memorandum statement and does not form part of the double entry system. Additional columns can be provided to indicate cost per unit at different stages of production or to enable comparison to be made of the current costs with that of historical costs.

9. Cost Unit

A cost unit is a standard of measurement of the goods produced or services rendered. It may be a selling unit, a job, batch, contract, process or a unit of service. The Institute of Cost and Management Accountants, London has defined a cost unit as "a unit of quantity of product, service or time (or a combination of these), in relation to which cost may be ascertained or expressed." Thus, a cost unit should be one with which costs can be conveniently associated. Further, it should be simple to understand, unambiguous to define and commonly used.

10. Cost centre

A cost centre may be an organisational division, an area of activity, a department, a person, machine or item of equipment, an individual worker, a shop in the works, a work bench, etc.

11. Cost estimation

Cost estimation is an attempt to estimate future cost on the basis of past experiences. Cost managers are interested in analysing past cost behaviour functions primarily because these help them to make more accurate cost predictions about future costs. Better cost predictions help managers make more informed planning and control decisions.

12. Cost allocation

Cost allocation is the process of identifying costs with cost centres or cost units. A cost which is directly identifiable to a specific cost centre or unit is allocated to that centre or unit. It is the allotment of whole item of cost to the concerned cost centre or cost unit. On the other hand, cost apportionment is the allotment of proportions of the common items of cost (on the basis of benefit received) to cost centres or cost units.

13. Cost apportionment

Cost apportionment is made on some suitable basis such as area occupied, number of workers, asset value, horse power of machines, number of light points, amount of wages, etc. In case of cost allocation, no such suitable base is required as the costs are directly identified to concerned cost centre or cost unit.

UNIT II

MANAGEMENT ACCOUNTING

i. Definition, Nature, Scope, Objectives and Functions of Management Accounting

ii. Need, Importance, Tools, techniques, Advantages & Limitations of Management Accounting

iii. Methods & systems of costing. Relationship between Financial Accounting & Cost Accounting; Financial Accounting & Management Accounting; and Cost Accounting & Management Accounting

2.1 MANAGEMENT ACCOUNTING

Introduction

Cost accounting, no doubt, serves the internal management by directing their attention on inefficient operations and assisting in a day-to-day control of activities of the enterprise. But even costing information fails to meet informational needs for managerial functions. The costing data needs to be arranged, re-analysed and processed further for playing more effective role in the managerial process. In addition to costing and accounting data, managerial functions need the use of socio-economic and statistical data (e.g., population break-ups, income structures, etc.) This information is beyond the scope of cost accounting and financial accounting which pave the way for emergence of management accounting. Management accounting provides all possible information required for managerial purposes.

2.1.1 Meaning of Management Accounting

Management Accounting is comprised of two words 'Management' and 'Accounting'. It is the study of managerial aspect of accounting. The emphasis of management accounting is to redesign accounting in such a way that it is helpful to the management in formation of policy, control of execution and appreciation of effectiveness. It is that system of accounting which helps management in carrying out its functions more efficiently.

2.1.2 Definition of Management Accounting

Management accounting is one of the branches of accounting. It is the study of managerial aspects of accounting. It provides relevant information to management so that planning, organizing, directing, controlling and coordination of business operations can be done in an effective manner.

Definition

1. **According to, "The institute of chartered accountants of India"** : management accounting is defined as "techniques and procedures by which accounting mainly seeks to aid the management collectively came to known as management accounting".

2. **According to "American Accounting Association" :** Management accounting includes the methods and concepts necessary for effective planning for choosing among alternative business actions and for control through the evolution and interpretation of performances".

3. **The national association of accountants (U.S.A) :** in statement no. 1 (statement on management accounting, 1982), has defined management accounting as" the process of identification, measurement, accumulation, analysis, preparation and communication of financial information used by management to plan, evaluate and control with in the organization and to assure appropriate use of accountability for its resources".

4. **The C.I.M.A (U.K) defines the term management as follows :** "Management accounting is an integral part of management concerned with identifying, presenting and interpreting information used for :

   a) Formulating strategy

   b) Planning and controlling activities

   c) Decision making

   d) Optimizing the use of resources

   e) Disclosure to share holders and other external to the entity

   f) Disclosure to employees

   g) Safe guarding assets

2.1.3 Nature of Management Accounting

The task of management accounting involves furnishing of accounting data to the management for basing its decisions on it. It also helps in improving efficiency and achieving organisational goals. The following are the main characteristics of management accounting :

1. Providing Accounting Information

Management accounting is based on accounting information. The collection and classification of data is the primary function of accounting department. The information so collected is used by the management for taking policy decisions. Management accounting involves the presentation of information in a way it suits managerial needs. The accounting data is used for reviewing various policy decisions. Management accounting is a service function and it provides necessary information to different levels of management.

2. Cause and Effect Analysis

Financial accounting is limited to the preparation of profit and loss account and finding out the ultimate result, i.e., profit or loss Management accounting goes a step further. The 'cause and effect' relationship is discussed in management accounting. If there is a loss, the reasons for the loss are probed. If there is a profit, the factors directly influencing the profitability are also studied. The figures of profits are compared to sales, different expenditures, current assets, interest payables, share capital, etc. So the study of cause and effect relationship is possible in management accounting.

3. Use of Special Techniques and Concepts

Management accounting uses special techniques and concepts to make accounting data more useful. .The techniques usually used include financial planning and analysis, standard costing, budgetary control, marginal costing, project appraisal, control accounting, etc. The type of technique to be used will be determined according to the situation and necessity.

4. Taking Important Decisions

Management accounting helps in taking various important decisions. It supplies necessary information to the management which may base its decisions on it. The historical data is studied to see its possible impact on future decisions. The implications of various alternative decisions are also taken into account while taking important decisions.

5. Achieving of Objectives

In management accounting, the accounting information is used in such a way that it helps in achieving organisational objectives. Historical data is used for formulating plans and setting up objectives. The recording of actual performance and comparing it with targeted figures will give an idea to the management about the performance of various departments. In case there are deviations between the standards set and actual performance of various departments corrective measures can be take at once. All this is possible with the help of budgetary control and standard costing.

6. No Fixed Norms Followed

In financial accounting certain rules are followed for preparing different accounting books. On the other hand, no specific rules are followed in management accounting. Though the :tools of management accounting are the same but their use differs from concern to concern. The analysis of data depends upon the person using it. The deriving of conclusions also depends upon the intelligence of the management accountant. Every concern uses the figures in its own way. The presentation of figures will be n the way which suits the concern most. So every concern has its own rules and by-rules for analysing the data.

7. Increase in Efficiency

The purpose of using accounting information is to increase efficiency of the concern. The efficiency can be achieved by setting up goals for each department or section. The performance appraisal will enable the management to pin point efficient and inefficient spots. An effort is made to take corrective measures so that efficiency is improved. The constant review of working will make the staff cost-conscious. Every one will try to control cost on one's own part.

8. Supplies Information and not Decision

The management accountant supplies information to the management. The decisions are to be taken by the top management. The information is classified in the manner in which it is required by the management. Management accountant is only to guide and not to supply decisions. The data is to be used by management for taking various decisions. 'How is the data to be utilised' will depend upon the calibre and efficiency of the management.

9. Concerned with Forecasting

The management accounting is concerned with the future. It helps the management in planning and forecasting. The historical information is used to plan future course of action. The information is supplied with the object to guide management for taking future decisions

2.1.4 Scope of Management Accounting

Management accounting is a new approach to accounting. It provides techniques for the interpretation of accounting data. It also helps in developing realistic approach to future course of action. The main aim is to help management in its functions of planning, directing and controlling. Management accounting is related to a number of fields.

1. Financial Accounting

Financial accounting deals with the historical data. The recorded facts about an organisation are useful for planning the future course of action. Though planning is always for the future but still it has to be based on past and present data. The control aspect too is based on financial data. The performance appraisal is based on recorded facts and figures. So management accounting is closely related to financial accounting.

2. Cost Accounting

Cost accounting provides various techniques for determining cost of manufacturing products or cost of providing service. It uses financial data for finding out cost of various jobs, products or processes. The systems of standard costing, marginal costing, differential costing and opportunity costing are all helpful to the management for planning various business activities.

3. Financial Management

Financial management is concerned with the planning and controlling of the financial resources of the firm. It deals with raising of funds and their effective utilisation. Its main aim is to use business funds in such a way that earnings are maximised.

4. Budgeting and Forecasting

Budgeting means expressing the plans, policies and goals of the enterprise for a definite period in future. The targets are set for different departments and responsibility is fixed for achieving these targets. Forecasting, on the other hand, is a prediction of what will happen as a result of a given set of circumstances. Forecasting is a judgement whereas budgeting is an organisational object. Both budgeting and forecasting are useful for management accountant in planning various activities.

5. Inventory Control

Inventory is used to denote stock of raw materials, goods in the process of manufacture and finished products. Inventory has a special significance in accounting for determining correct income for a given period. Inventory control is significant as it involves large sums. The management should determine different levels of stocks, i.e., minimum level, maximum level, re-ordering level for inventory control.

6. Reporting to Management

One of the functions of management accountant is to keep the management informed of various activities of the concern so as to assist it in controlling the enterprise. The reports are presented in the form of graphs, diagrams, index numbers or other statistical techniques so as to make them easily understandable. The management accountant sends interim reports to the management and these reports may be monthly, quarterly, half-yearly.

7. Interpretation of Data

The management accountant interprets various financial statements to the management. These statements give an idea about the financial and earning position of the concern. These statements may be studied in comparison to statement of earlier periods or in comparison with the statements of similar other concerns.

8. Control procedures and Methods

Control procedures and methods are needed to use various factors of production in a most economical way. The studies about cost, relationship of cost and profits are useful for using economic resources efficiently and economically.

9. Internal Audit

Internal audit system is necessary to judge the performance of every department. The actual performance of every department and individual is compared with the pre-determined standards. Management is able to know deviations in performance. Internal audit helps management in fixing responsibility of different individuals.

10. Tax Accounting

In the present complex tax systems, tax planning is an important part of management accounting. Income statements are prepared and tax liabilities are calculated. The management is informed about the tax burden from central government, state government and local authorities.

11. Office Services

Management accountant may be required to control an office. He will be expected to deal with data processing, filling, copying, duplicating, communicating, etc. He will also be reporting about the utility of different office machines.

2.1.5 Objectives of Management Accounting

The main function of management accounting is to provide the relevant information to the management from time to time to help in achieving the organization goals i.e., maximizing the profits and minimizing the loss. The following are the important objectives of management accounting :

1. Formulating the Plans and Policies

Planning is one of the important functions of Management. Planning is essentially related to future. It includes forecasting, setting goals and deciding alternate course of actions and deciding on the programs of activities to be undertaken. Management Accounting, by providing past information based on results, helps in planning and forecasting of production, sales, cash inflows and outflows.

2. Helps in Organizing

The process of organizing involves dividing the whole enterprise into departments, divisions, units and entrusting the staff with their clear-cut operations. Management Accounting is concerned with the establishment of cost centers, budget centers, and profit centers with a view to control costs and responsibilities.

3. Helps in Interpretation of Financial Information

Management accounting presents the financial information to the management in such a way that it is easily understood. Even it helps in presenting the technical data in a simple language. If necessary it uses charts, diagrams, Index numbers etc.

4. Reporting

It helps the management in taking timely decisions. The management accountant informs the financial position to the management from time to time through reports.

5. Motivating the Employees

By fixing targets to be achieved and providing the incentives, the management accounting motivates the employees to put in their best.

6. Helpful in Decision Making

During the course of business, management has to take certain important decisions like replace of labour with machines or introduction of latest technology, expansion or diversification of production etc. Management Accountant prepares a report on the feasibility of various alternatives and makes assessment of their financial implications. This information helps the management in taking correct decision in correct time.

7. Helps in Controlling

Management accounting devices like standard costing and budgetary control are helpful in controlling performance. When actual performance is compared with predetermined objectives the management is able to find out the deviations and take necessary corrective measures.

8. Helpful in Coordination

Management accounting helps the management by providing various tools to coordinate various departments/ sections. This can be done through functional budgeting.

9. Helpful in Tax Administration

Management accounting helps in assessing various tax liabilities and depositing the correct amount of taxes with the authorities concerned.

2.1.6 Functions of Management Accounting

The basic function of management accounting is to assist the management in performing its functions an orderly manner efficiently and effectively. The emphasis of Management Accounting is to redesign accounting in such a way that it is helpful to the management in decision making process.

The manner in which Management Accounting satisfies the various needs of management for arriving at appropriate business decision may be described as follows:

1. Modification of Data

Management accounting modifies the accounting data presented in financial data in such a way which is more suitable and highly useful to management. This modified data is highly useful to the management in planning various activities.

2. Financial Analysis and Interpretation

Management accounting helps in interpreting the financial data presented in the financial statements in simplified way and presents in nontechnical manner with comments and suggestions. The management accountant analyse the financial data, and presents to the management with his suggestions, and comments on various alternatives. Then it is easy for the management to take decisions.

3. Planning and forecasting

Planning and forecasting are essential for achieving the desired business activities. Management accounting by providing necessary information assist the management in forecasting. Management accountant with the help of various statistical techniques such as probability, correlation and regression, marginal costing, funds flow statements etc., prepare plans and forecasting.

4. Communication

In business concern different levels of management needs different types of information. The management accountant by preparing various reports, establish communication with in the organisation and also with the outside world.

5. Managerial Control

It helps the management to assess the performance of every one in organization. All this is done with the help of standard costing and budgetary control which are a part and parcel of management accounting.

6. Use of Non-Monetary Information

Management accounting does not restrict itself merely to financial data for helping the management in decision making process, but also considers nonmonetary information. Such information may be collected from case studies, minutes of meeting, engineering records, surveys etc.

7. Strategic Decision Making

Very frequently, the management has to take strategic decision such as make or buy decisions, replacing the old machinery with latest one, temporary shut down of business, decision to enter in new market etc. Management accounting come to the rescue of management by providing financial, technical, and statistical data in detail to enable it to take a decisions.

8. Coordination

Management accountant by acting as coordinator among various departments through budgeting and financial reports, and work to achieve coordination.

9. Staff Education

Management accounting educates the staff working in the concern in respect of technique used, their purpose and their benefits.

2.2 Need / Purpose of Management Accounting

Management accounting is required to recognize the financial situation of the business, it reports to those inside the organisation for planning, directing, motivating, and controlling and performance evaluation. It gives special emphasis on decision affecting the future. It is needed to prepare plan.

Purpose of Management Accounting

Management accounting is a method used to analyze a company's financial information and to plan for future needs and goals of the business.

(i) Planning

Management accounting is used to plan for future needs of companies by using the financial information. They are given to plan budgets and implement strategies to increase profitability.

(ii) Directing and Motivating

Directing and motivating employees is a purpose of management accounting. Management accountants serve as liaisons between employees and upper-level management to answer questions and help to solve problems.

(iii) Controlling

These accountants follow through with plans they have developed and make sure they are carried out.

(iv) Analyzing

The primary purpose of management accounting is to analyze information. They determine problematic areas and develop ways to correct them. They use the information to develop ways of increasing the company's profit.

(v) Reports

Most of the goals and plans developed by these accountants take the form of reports. The reports they generate state clearly the conclusions they have reached and their recommendations for solutions to problems.

2.3 IMPORTANCE OF MANAGEMENT ACCOUNTING

In the present highly competitive and complex industrial world, Management Accounting has become an integral part of management. It guides the management at every step and meets the information needs of various levels of management. Management Accounting improves the efficiency of management in all aspects. It may be summarized as follows:

1. Proper Planning

Management accounting helps the management to plan various business operations by providing accounting information. The management formulates policies, programs and strategies with the help of accounting information. It helps to develop effective internal control and audit system. Efficient planning and effective organisation brings systematic regularity in business activities.

2. Increase Efficiency

Management accounting encourages efficiency in business operations. The targets of different departments are fixed in advance and achievement of targets forms a yardstick for measuring their efficiency.

3. Measurement of Performance

The system of budgetary control and standard costing enable the measurement of performance. In standard costing, standards are determined in advance and then the actual cost is compared with the standard cost. It helps the management to know the deviations if any between standard cost and actual cost. The performance will be good if the actual cost does not exceed the standard cost.

4. Maximum Profitability

The use of management accounting may control or even eliminate various types of wastage, production defectives etc. The various management techniques are used to control cost of production. The reduction in cost of production increases the sales volume, thereby maximum the profits of the concern.

5. Maximum return on Capital Employed

Management accounting through the process of planning, control and coordination helps the management in getting maximum returns on capital employed.

6. Good industrial Relations

Unacceptable standards, or sub-standards which are often responsible for unhealthy and had relations between management and labour can be removed by the use of Management Accounting, Industrial relations can thus be improved. It creates a good climate for further investments in the business concerns.

7. Services to Customers

The cost control devices employed in management accounting enable the reduction of prices. All employees in the concern are made cost conscious. Since, quality of goods is determined in advance. The quality of products becomes good and hence the customers are provided quality goods at reasonable prices.

8. Effective Management Control

The tools and techniques of management accounting are helpful to management in planning, controlling and coordination of the activities of the concern. The techniques of budgetary control, standard control, standard costing and departmental operating statements greatly help in performing the controlling function. Setting up of determined standards and comparing the actual performance with predetermined standards at regular intervals enables the management to have management by exception.

9. Helps in Communication

Management accounting helps in communicating up to date information to various parties interested in the successful working of a business organisation.

2.4 Tools and Techniques of Management Accounting

A number of tools and techniques are used to supply the information required by the management. No one technique can satisfy all managerial needs. The tools and techniques used in management accounting are discussed as follows :

1. Financial Policy and Accounting

Every concern has to take a decision about the sources of raising funds. The funds can be raised either through the issue of share capital or through the raising of loans. Again a decision is to be taken about the type of capital, i.e., equity share capital or preference share capital. Preference share capital can be sub-divided into a number of types. The second decision concerns the raising of loans. Whether the loans should be long term or short-term is again a matter of policy.

The proportion between share capital and loans should also be decided. All these decisions are very important and management accounting provides techniques for financial planning. Tax planning is another aspect where management is helped by the management accountant. He tries to use various rules and regulations for the benefit of the organisation.

2. Analysis of Financial Statements

The analysis of financial statements is meant to classify and present the data in such a way that it becomes useful for the management. The meaning and significance of the data is explained in a non-technical language. The techniques of financial analysis include comparative financial statements, ratios, funds flow statements, trend analysis, etc.

3. Historical Cost Accounting

The system of recording actual cost data on or after the date when it has been incurred is known as historical cost accounting. The actual cost is compared to the standard cost and it gives an idea about the performance of the concern. Though costing is important but by itself its utility is limited.

4. Budgetary Control

It is a system which uses budgets as a tool for planning and control. The budgets of all functional departments are prepared in advance. The budgets are based on historical data and future possibilities. The actual performance is recorded and compared with the pre-determined targets. Management is able to assess the performance of each and every person in the organisation. The timing of budgets and finding out deviations is an important tool for planning and controlling.

5. Standard Costing

Standard costing is an important technique for cost control purposes. In standard costing system, costs are determined in advance. The determination of standard cost is based on a systematic analysis of prevalent conditions. The actual costs are recorded and compared with standard costs. The variances, if any, are analysed and their reasons are ascertained. Standard costing helps to enhance the efficiency of the concern and also 'management by exception'.

6. Marginal Costing

This is a method of costing which is concerned with changes in costs resulting from changes in the volume of production. Under this system, cost of product is divided into marginal (variable) and fixed cost. The latter part of cost (fixed) is taken as fixed and is recorded over a level of production and every additional production unit involves only variable cost. Marginal costing is helpful for measurement of profitability of different lines of production, different departments and divisions of an enterprise. The decisions about short term utilisation of capacity are also assessed with the help of marginal costing.

7. Decision Accounting

An important work of management is to take decisions. Decision taking involves a choice from various alternatives. There may be decisions about capital expenditure, whether to make or buy, what price to be charged, expansion or diversification, etc. Management accounting calculates financial implications of each alternative course of action and enables management to select the best course of action.

8. Revaluation Accounting

This is also known a Replacement Accounting. The preservation of capital in the business is the main object of management. The profits are calculated in such a way that capital is preserved in real terms. During periods of rising prices, the value of capital is greatly affected. According to Batty, "Revaluation accounting is used to denote the methods employed for overcoming the problems connected with fixed asset replacement in a period of rising prices."

9. Control Accounting

Control accounting is not a separate accounting system. Different systems have their control devices and these are used in control accounting. Standard costing and budgetary control can be exercised through variance analysis reports. In control accounting we can use internal check, internal audit, statutory audit and organisation and methods for control purposes.

10. Management Information Systems

With the development of electronic devices for recording and classifying data, reporting to management has considerably improved. The data planning co-ordination and control is supplied to the management. Feed back of information and responsive actions can be used as control techniques.

2.5 Advantages of Management Accounting

1. Management's need for information

Various levels of management are concerned with different issues. Each issue requires unique information. Complete and detailed information of every aspect of business has to be collected and analyzed, which is possible only with Management Accounting.

2. Efficient Planning and Effective Organization

Management Accounting leads to efficient planning in an effective organization. Policies, Programmes and Strategies are formulated with the help of available information. A sound and effective internal control and audit system can be developed.

3. Service to Customers

Management Accounting helps in cost reduction and production of better quality goods, thereby resulting in better services to customers of the organization.

4. Increase in Efficiency

Management Accounting encourages efficiency in business operations. For example, standards are fixed for production by workers. Incentives are based on performance in relation to standards.

5. Maximum Profitability

Management Accounting not only helps in cost reduction, but also assists management in choosing the alternatives that provide the maximum yield. Maximum return on capital employed is ensured.

6. Industrial Relations

Unacceptable standards or sub standards, which are often responsible for unhealthy and bad relations between management and labour class, can be removed by the use of Management Accounting. Industrial Relations can thus be improved.

7. Control

The tools and techniques of management accounting are helpful to the management in planning, coordinating and controlling activities of the concern. Timely remedial actions can be taken.

8. Contribution to Society

The economic uplift of the community and development of nation's economy can be achieved by the use of Management Accounting.

2.6 Limitations of Management Accounting

Management Accounting also suffers from some limitations. Unless these limitations are taken into account while using Management Accounting system, the so called Management Accounting advantages cannot be availed. The following are the limitations :

1. Based on Accounting records

Management accounting derives information from financial accounting, cost accounting and other record. The accuracy of data and conclusions drawn from them depend to a large extent on the accuracy of basic records such as financial and cost records. In other words the merits and demerits of management accounting depend upon the merits and demerits of the basic records.

2. Persistent Efforts

The conclusion and decisions are drawn by the management accountant are not executed automatically. He has to convince the authorities at all levels. Thus, there is need for continuous and coordinated efforts of each management level to execute these decisions.

3. Wide Scope

The scope of management accounting is very wide and broad based and this creates many difficulties in the implementation process. It considers both monetary as well as nonmonetary factors. This brings a degree of inexactness and subjectivity in the conclusions obtained through it.

4. Costly Installation

The installation of management accounting system is a costly affair. It needs an elaborate organisation system and number of rules and regulations. Its use is only limited to the large concerns which can afford it.

5. Evolutionary Stage

Comparatively management accounting is a new discipline and is still very much in a state of evolution. The techniques and tools used by this system give varying and differing results. The conclusions drawn from analysis and interpretation are not the same.

6. Personal Bias

The interpretation and analysis of financial information depends upon the capacity or ability of interpreter (Management Accountant). The data must be carefully analysed and interpreted without involving personal judgements. But here is every likelihood that the analysis and interpretations are influenced by personal bias. Personal prejudices and bias affect the objectivity of decisions.

7. Psychological Resistance from Staff

The installation of management accounting involves basic change in organisational setup. It calls for a rearrangement of personal as well as their activities. New rules and regulations are also required to be framed which affect a number of people. Hence, there is a possibility of resistance from one quarter or other.

8. Not a Substitute to Management

Management accounting is a tool for management. It is not a substitute for management or administration. Ultimate decisions and corrective steps or measures are being taken by management and not by management accountant. So, management accounting has a supplementary service function and has no final say neither in taking decisions nor in their implementation.

9. Lack of Knowledge

The use of management accounting requires the knowledge of a number of related subjects such as Accountancy, Statistics, Management Science, Econometrics and Engineering etc. Management should be conversant with all the subjects. Deficiency in knowledge of any of these subjects limits the use of management accounting.

10. Lack of well Established Conventions

Management accounting is of recent origin. It is still in developing stage. It does not have well established conventions as other branches of accounting.

2.7 Methods and Systems of Costing

Introduction

Every business enterprise, in some ways, is different from the other. As such, several methods or systems of costing have been developed to suit the needs of individual business conditions. The general fundamental principles of ascertaining costs are the same in every system of costing but the method of analysis and presentation of costs differ from industry to industry. The main consideration which applies to the choice of a particular method of costing is the nature and type of products or services rendered by an enterprise.

2.7.1 Methods of Costing

Basically, there are two principal methods of costing :

1. Job costing
2. Process costing

1. Job Costing

Job costing is system of costing in which costs are ascertained in terms of specific job or order which are not comparable with each other. The unit of costing in this method is a job or a special work order. The job may consist of a single unit (a ship or a boat) or it may consist of various units of identical or similar products covered under a single work order (e.g. printing of 10,000 books, or painting of 2,000 similar boards). In this method of costing, each job or work-order is given a number and all costs relating to that job or order are recorded separately for each job. This method of costing is suited to industries engaged in printing, foundry, ship building, engineering, automobile garages, repair shops, made to order articles, building construction, machine tools, locomotives, etc. Job costing includes the following methods of costing.

(a) Batch Costing : This method of costing is applied to industries where production is carried on in batches. Under this method, a batch of similar products is regarded as one job and the cost of this complete batch is ascertained. The total cost of the batch is then divided by the total number of units in the batch in order to determine the cost per unit. This method is particularly suitable for industries engaged in confectionery, toy-making, medicines, readymade garments, spare parts, processed food, components manufacture, hardware articles like bolts, nuts, cycle parts, etc.

(b) Contract Costing or Terminal Costing : This is a method of costing which is used in case of big jobs spread over a period of time. A contract is a big job and hence the principles of job costing are applied to contract costing. A separate account is kept for each individual contract. This method is also known as terminal costing as the cost can be terminated at some point and related to a particular job. This method of costing is generally applicable to undertakings engaged in building construction, ship-building, construction engineering, civil engineering, mechanical engineering, etc.

(c) Departmental Costing : When it is desired to ascertain the cost of operating a department or the cost of products turned out by a department, the method of departmental costing is used. For example, in case of large undertakings it is advisable to ascertain the cost of a department so as to allocate it among the various jobs turned out by that department.

2. Process Costing

Process costing is the method of costing that is employed by the type of industries where a product passes through different processes, each distinct and well defined, it is desired to know the cost of production at each process. In order to know the cost at each stage or process of production, a separate account is opened for each process and when the material is transferred from one process to another, the cost incurred upto that process is also transferred to the succeeding process. This method of costing is most suitable for mass production industries engaged in continuous production of uniform standard product such as textiles, chemicals, paper, sugar, oil, cement, mining, brewery, paints and varnish, etc. Process costing includes following methods of costing:

(a) Single output or Unit Costing : This method of costing is applied where production is continuous and uniform and the industry is engaged in the production of a single product or a few grades of the same product. In this method the total cost is divided by the number of units produced to ascertain cost per unit and it is applied in industries like collieries, quarries, bricks works, oil drilling, paper mills, flour mills, cement manufacturing, textile mills, etc.

(b) Operating Costing : This method is suitable for the industries which render services rather than manufacture goods. Operating costing is used to ascertain the cost of rendering services such as railways, airways, roadways, hotels, power supply, water supply, etc.

(c) Operation Costing : Operation costing is a further refinement of process costing and is a system of costing which is used in industries engaged in repetitive mass production. If the manufacture of a product involves a number of operations and not processes, the cost is ascertained for each operation. It is most suitable for engineering industries, toy-making, etc. where mass production is carried on in a repetitive nature.

3. Multiple or Composite Costing

Multiple Costing represents the application of more than one method of casting in respect of the same product. It is suitable for industries where a number of components are seprately manufactured and then assembled to form a finished product such as aeroplanes, automobiles, cycles, machine tools, radios, sewing machines, refrigerators, televisions, typewriters, etc.

2.7.2 Techniques of Costing

In addition to the above methods of costing, the following techniques of costing are used for controlling costs and taking managerial decisions :

1. Marginal Costing

It is a technique of ascertainment of marginal cost by differentiating between fixed and variable cost. It is used to determine the effect of changes in volume on profit.

2. Absorption Costing

Absorption costing is the practice of charging all costs, both fixed and variable to products, processes or operations. It differs from marginal costing where fixed costs are not Considered to form part of the cost of a product, process or operation.

3. Direct Costing

It is the practice of charging direct costs to products, processes or operations. All the indirect costs are to be written off against profits in the period in which they arise.

4. Uniform Costing

It is the practice of costing under which several undertakings of the same industry adopt the same costing principles and/or practice. Uniform costing facilitates comparison of cost of different undertakings and helps in control and determination of cost for the industry as a whole.

5. Standard Costing

It is a technique of costing under which the cost of a product is determined in advance on certain pre-determined standards, a comparison is made of actual cost with the pre-determined standard cost to find out variances, if any, so as to take corrective action as and when needed.

6. Cost Plus Contracting

It is a system of cost accounting used for contracts undertaken on the basis of a contract price which includes direct expenses plus an a agreed sum or percentage to cover overhead costs and profits.

7. Historical Costing

It is system of costing whereby costs are ascertained after they have been incurred. Compared to standard costing, it has a limited utility.

2.7.3 Installation of A Costing System

The installation of a costing system requires careful consideration of a number of factors. The existing organisational structure should be studied and efforts should be made to adopt costing system without disturbing it. The over-lapping of records will have to be avoided to make the system economical and efficient.

Following steps are essential for installing a costing system :

1. Objectives to be Achieved

The objective to be achieved should be very clear so that a thrust is given to that aspect. If the main objective is to expand production, then the costing system should give more attention to production aspect, if the emphasis is to improve marketing of products then that area should be cared well.

2. Study the Product

The study of the product is very essential. The nature of the product determines the type of costing system to be used. A product requiring high costs on materials will need a costing system giving main emphasis on pricing, storing, issuing and controlling of material cost. On the other hand, if the product requires high labour cost then efficient system of time-recording and wage payment will be essential and the same will be true of overhead cost too.

3. Study the Organisation

An effort should be there to introduce the costing system in the existing organisational set up. As for as possible, the organisation should be least disturbed. It becomes, therefore, necessary to see the nature of the business and of the operations, the extent of authority and responsibility, the methods of dealing with wastages of materials, the system of wage payment, the sources from which the cost accountant has to derive information etc.

4. Deciding the Structure of Cost Accounts

A decision about the structure of cost accounts is the next step in the process of installing a costing system. The details of a suitable costing system should be worked out. The type of manufacturing process will determine the structure of cost accounts. The sequence of production line should be followed by the costing system. The system should be so designed that there is a gradual build up of the cost at each significant stage of production.

5. Selecting the Cost Rates

A decision is required for the allocation of various expenses among different products. What expenses are direct and what expenses are indirect. From indirect expenses an allocation is made among factory, office and selling and distribution overheads. This division of expenses will help in determining the cost rates.

6. Introduction of the System

The success of the costing system will depend upon its proper implementation. Its implementation will be possible with the full co-operation of employees in the organisation. There is a general human tendency to oppose new things. This can be tackled by properly explaining the system to the employees and the benefits accruing from its implementation in the future. If required, the system should be gradually introduced instead of implementing it in full. At one stage the system may cover labour costs, at another time it may include materials cost and so on. As far as possible the existing routine should not be disturbed. The whole-hearted support of all employees will be helpful in making the costing system a success.

7. A Follow-up

A follow-up of the system is essential to make it practicable and useful. When a system is put into actual practice then its weaknesses and deficiencies may be realised. While collecting cost information from various sources there may be some difficulties in compilation of information, the data may not be sufficient, there may be delays in supplying information. Once a problem is faced then efforts should be made to rectify it. The system should be readjusted to make it more useful and efficient.

2.7.4 Difficulties in Installing a Costing System

While introducing a costing system, some practical difficulties are faced, these are discussed as such :

1. Lack of Support from Top Management

It may so happen that the Managing Director may introduce costing system without consulting departmental managers or without taking them into confidence prior to its introduction. This results in the opposition of the system. Departmental heads take it as device to check their activities.

This difficulty can be overcome by taking into confidence of top managers before introducing the system. They can be told of the need and utility of the costing system.

2. Resistance from the Existing Staff

The resistance from the existing financial accounting staff is natural because they are unsure of their role and position in the organisation after the introduction of the costing system.

The existing staff can be assured of their present positions and that a new system is meant to strengthen the existing system.

3. Non-co-operation at Other Levels

There may be an opposition to the costing system from other levels of the organisation. The foremen, superviors and other staff may resent the additional burden of supplying information to the costing department.

To secure the active co-operation of these employees, the necessity and utility of the system should be explained to them. A need for their co-operation in making the system successful should be emphasised.

4. Shortage of Trained Staff

There may be a shortage of trained personnel to handle the work of cost analysis, cost control and cost reduction. The work of the costing department can be handled only by the competent persons.

This difficulty can be overcome by giving expertise training to the existing staff and by recruiting trained staff from outside, if needed.

5. Heavy Costs

The costing system will involve heavy costs if it is not designed according to the requirements of specific cases.

The costing department should be used as a service department so that it provides information to every department. It will make it more useful and will reduce its cost burden.

2.8 Relationship between Financial Accounting and Cost Accounting

Despite the close relationship, there are certain points of distinction between financial accounting and cost accounting. The main points of distinction are given as under :

1. Object

The object of financial accounting is to record various transactions with the purpose of maintaining accounts and to know the financial position and to find out profit or loss at the end of the financial year. These records are useful to shareholders, creditors, bankers, debentureholders etc. On the other hand cost accounting provides information for managerial planning, control and decision-making.

2. Nature

Financial accounting is mainly concerned with the historical data and deals with actual facts and figures. It records only those transactions which have already taken place. Cost accounting uses projected or estimated figures also. It deals with the projection of data for the future.

3. Subject Matter

Financial accounting is concerned with assessing the results of the whole business while cost accounting deals separately with different products, processes, units, departments and cost centres. In financial accounting overall performance is judged, while in cost accounting the results are analysed separately for each product, process etc. to evaluate their performance.

4. Compulsion

The preparation of financial accounts is compulsory for most of the undertakings while these are a necessity in others. The financial accounts are maintained to comply with the Companies Act, Income Tax Act and other laws. However, the maintenance of the cost accounting records and the form in which they are to be

kept are not prescribed generally. It is only a service function and is helpful to the management in planning and control. In most of the cases, the management is free to use or not to use cost accounting. But, the Companies Act, 1956 has now made it compulsory to maintain prescribed cost records for certain manufacturing undertakings.

5. Accounting Principles

Financial accounts are governed by the "generally accepted accounting principles". On the contrary cost accounting is not bound to use the generally accepted accounting principles form and method of presenting information under cost accounting differs from concern to concern.

6. Reporting

Financial accounting statements are prepared to find out profitability and financial position of a concern. These statements are useful mainly to the outsiders like bankers, investors, shareholders, creditors, financial analysts etc. Thus, these statements are prepared not only for the benefit of the concern but also for outsiders. Cost accounting reports are basically meant for internal use only. These are prepared for the use of different levels of management to help in policy formulation and control.

7. Periodicity of Reporting

Financial accounting observes the accounting period convention. Financial reports such as profit and loss account and balance sheet are prepared at the end of the accounting period, which is usually a year. On the other hand, cost accounting ignores this convention of periodicity. Cost accounting reports are prepared whenever needed. Such reports may be prepared on a monthly, fortnightly, weekly or even daily basis. Frequency of reports in cost accounting is determined by the needs of the management.

8. Units of Measurement

Only those transactions are recorded in financial accounting which can be measured in monetary terms. Any information which cannot be measured in terms of money finds no place in financial accounting. In comparison, cost accounting uses besides the monetary unit, various measurement units such as labour hours, man hours, product units, machine hours, etc.

9. Control

Financial accounting does not provide sufficient means to exercise control over costs. It lays emphasis on the recording aspect without attaching any importance

to control costs. On the other hand, cost accounting involves various systems of control such as standard costing and budgetary control for materials, labour and overhead costs.

10. Efficiency

Financial accounts do not provide necessary information to measure the relative efficiency of various workers, plants, departments etc., whereas cost accounts provide valuable information in this regard which helps the management in taking various decisions and formulating policies and plans.

11. Fixation of Selling Prices

Financial accounting is not helpful in fixing prices of products in advance, whereas cost accounts provide detailed information about variable and fixed costs, direct and indirect costs etc. which form the basis for estimating costs and fixation of selling prices.

12. Others

In addition to the above mentioned differences financial accounting differs from cost accounting in many other ways such as methods of stock valuation, charging of indirect expenses, depreciation, wastages, etc.

2.8.1 Differences between Financial Accounting and Cost Accounting

Basis	Financial Accounting	Management Accounting
1. Users	Internal and external General-purpose financial statements can be used by external and internal users. However, they are prepared pimarily for external users, such as the investors, lenders and creditors, and the government.	Internal The reports prepared in managerial accounting are strictly for use by internal users, i.e. the management.
2. Compliance with accounting standards	Required Financial accounting requires strict compliance with established accounting standards.	Not required Management accounting is not required to follow accounting standards since the only users are the members of the management.

3. Time orientation	Historical Financial accounting processes historical information and summarizes them in the preparation of financial statements.	Current and future Management accounting deals with current problems of the company. Also, management accounting involves the preparation of budgets and forecasts.
4. Emphasis	Reliability, verifiability, objectivity of financial information	Relevance and timeliness, to provide the maximum aid in management decisions
5. Necessity	Mandatory Financial accounting is required by law. Companies are mandated to furnish financial statements periodically.	Optional Management accounting is not mandatory. However, a company that does not use it will suffer great consequences.
6. Purpose of reports	General-purpose Financial statements provide general information, addressing the common needs of its users.	Special-purpose The financial reports in managerial accounting address a specific issue or concern.
7. Details of reports	Concise Financial statements present data in an summarized and concise way.	More detailed Financial reports carefully detail all information that the management should consider in making specific decisions.
8. Sources of data	Sources within the company, i.e. the accounting records of the company	Any source, both internal and external such as interest rates, political environment, economic and industry concerns, etc.
9. Frequency of reports	Financial statements are usually furnished monthly, quarterly, annually.	Financial reports in management accounting are prepared as the need arises.

2.9 Financial Accounting and Management Accounting

Financial accounting and management accounting are the two branches of the accounting information system of business enterprises. Financial accounting is concerned with the recording of day-to-day transactions of the business. These transactions are classified according to their nature. These transactions enable the concern to find out profit and loss for a particular period and financial position of the concern is also judged on a particular date through profit and loss account and balance sheet respectively.

On the other hand, management accounting uses financial accounts and taps other sources of information too. The accounts are used in such a way that they are helpful to the management in planning and forecasting various policies. Thus, financial accounting has a significant influence on management accounting. Further the principles of financial accounting are equally useful in management accounting also. It should also be noted that management accounting is only an off-shoot of financial accounting. Both financial and management accounting are complementary and are necessary in running the concern efficiently.

Despite the close relationship, there are certain points of distinction between financial accounting and management accounting. The main points of distinction between financial and management accounting are discussed as below :

1. Object

The object of financial accounting is to record various transactions with the purpose of maintaining accounts and to know the financial position and to find out profit loss at the end of the financial year. These records are useful to shareholders, creditors, bankers, debenture holders, etc. On the other hand, management accounting is essential to help management in formulating policies and plans.

2. Nature

Financial accounting is mainly concerned with the historical data. It records only those transactions which have already taken place. Management accounting deals with projection of data for the future. It uses historical data only for taking decisions for the future. In financial accounting actual figures are used whereas in management accounting projected or estimated figures are used.

3. Subject-matter

Financial accounting is concerned with assessing the results of the whole business while management accounting deals separately with different units, departments and cost centres. In financial accounting overall performance is judged, while in management accounting the results of different departments are evaluated separately to find out their performance differently. Financial accounts are concerned with details whereas management accounting is concerned in analysing data from different angles.

4. Compulsion

The preparation of financial accounts is compulsory in certain undertakings while these are necessity in others. Management accounting is not compulsory. It is only a service function and is helpful to the management in administration of the business. The management is free to use or not to use management accounting. Under certain laws a particular procedure is to be followed for preparing financial accounts whereas there are no such procedures in management accounting. It is the suitability of the management which is important while using management accounting.

5. Precision

In management accounting no emphasis is given to actual figures. The approximate figures are considered more useful than the exact figures. In financial accounting only actual figures are recorded and there is no room for using approximate figures. The transactions are recorded only when they have taken place so exact figures are used.

6. Reporting

Financial accounts are prepared to find out profitability and financial position of the concern. These reports are useful for outsiders like bankers, investors, shareholders, Government agencies, etc. These reports are prepared not only for the benefit of the concern but also for outsiders. Management accounting reports are meant for internal use only. These are prepared for the benefit of different levels of management. Financial reports such as profit and loss account and balance sheet are prepared for a specific period and on a particular date. On the other hand, there is no such binding for preparing management accounting reports. The main idea for preparing these reports is to enable the management to have a view about the position of the concern and no consideration is given to the period. Management accounting reports are rather future projections of figures.

7. Description

Only those things are recorded in financial accounting which can be measured in monetary terms. Anything which cannot be recorded in figures is outside the scope of financial accounting. Management Accounting uses both monetary and non-monetary events. The competition in the market, impact of political changes, a situation of trade cycles and such other factors are also considered in management accounting, though these cannot be measured in monetary terms.

8. Quickness

Reporting of management accounting is very quick. Management is fed with reports at regular intervals. Various figures are required to take managerial

decisions at different levels of management. On the other hand, reporting of financial accounting is slow and time consuming. Profit and loss account and balance sheet are prepared at the end of the financial year. Management is able to know the profitability and financial position only after the preparation of final accounts.

9. Accounting Principles

Financial accounts are governed by the generally accepted principles and conventions. No set principles are followed in management accounting. Management accounting is used for taking policy decisions, so, form and method of presenting figures differs from concern to concern. The requirement and expediency of the situation determines the mode of information to be presented.

10. Period

Financial accounts are prepared for a particular period. Profit and Loss Account is generally prepared for one year. All the items relating to that year are taken to P/L Account. Balance Sheet is prepared on a particular date. It reveals the financial position of the concern on that date. Management accountant supplies information from time to time during the whole year. There are no specific periods for which management accounts are prepared.

11. Publication

Financial accounts like profit and loss account and balance sheet are published for the benefit of the public. Under companies law every registered company is supposed to supply a copy of Profit and Loss Account and Balance Sheet to the Registrar of Companies at the end of the financial year. Management accounting statements are prepared for the benefit of the management only and these are not published.

12. Audit

Financial accounts can be got audited. Under Company Law, auditing of financial accounts is compulsory. Management accounts cannot be audited. They are not based on actual figures and projected data are also used in management accounting. So, it is not possible to get management accounts audited.

It is clear from the earlier discussion that financial accounts are based on historical data and only actual facts and figures are recorded. Management accounting too uses historical data but the purpose is to use it for planning and forecasting. Both financial and management accounting are complementary and are necessary in running the concern efficiently.

2.9.1 Difference Between Financial Accounting and Management Accounting

Point of Distinction	Financial Accounting	Management Accounting
1. Object	The object is to record various transactions and to know the financial position and to find out profit or loss at the end of the financial year.	The main objective is to provide information to management for formulating policies and plans.
2. Nature	It is mainly concerned with historical data. It records only those transactions which have already taken place.	It deals with projection of data for the future. It uses historical data only for taking decisions for the future.
3. Subject Matter	It is concerned with assessing the results of the business as a whole.	It deals separately with different units, departments and cost centres.
4. Legal Compulsion	The preparation of financial accounts is compulsory in certain undertakings while these are necessity in others.	It is not compulsory. It is only a service function and is helpful in administration of the business.
5. Precision	In financial accounting only actual figures are recorded with perfect accuracy and precision.	In management accounting, no emphasis is given to actual figures, the approximate figures are considered more useful.
6. Reporting	Financial reports are prepared not only for the benefit of the concern but also for outsiders.	Management accounting reports are meant for internal use only.
7. Description	It records only those transactions which can be measured in monetary terms.	It uses both monetary and non-monetary events or information.
8. Quickness	Reporting of financial accounting is slow and time consuming.	Reporting of management accounting is very quick.
9. Accounting Principles	It is governed by generally accepted principles and conventions.	No set principles are followed in management accounting.
10. Period	Financial accounts are prepared for a particular period.	It supplies information from time to time during the whole year.
11. Publication	Financial statements are published for the benefit of the public.	Management accounting statements are not published.
12. Audit	Financial accounts can be got audited. Under company law, audit is compulsory.	Management accounts cannot be audited.

2.10 Cost Accounting and Management Accounting

Cost Accounting is the classifying, recording and appropriate allocation of expenditure for the determination of the costs of products or services, and for the presentation of suitably arranged data for purposes of control and guidance of management. It includes the ascertainment of the cost of every order, job, contract, process, service or unit as may be appropriate. It deals with the cost of production, selling and distribution.

It is thus the provision of such analysis and classification of expenditure will enable the total cost of any particular unit of production or service to be ascertained with reasonable degree of accuracy and at the same time to disclose exactly how such total cost is constituted *(i.e.* the value of material used, the amount of labour and other expenses incurred) so as to control and reduce its cost.

Meaning of Management Accounting

Management Accounting is the presentation of accounting information in such a way as to assist management in the creation of policy and the day-to-day operation of an undertaking. Thus, it relates to the use of accounting data collected with the help of financial accounting and cost accounting for the purpose of policy formulation, planning, control and decision-making by the management.

Relationship Between Cost Accounting and Management Accounting

Cost Accounting and Management Accounting both have the same objectives of helping the management in planning, control and decision-making. Both are internal to the organisation and use common tools and techniques like standard costing, variable costing, budgetary control etc. Inspite of these similarities there are certain differences between these two.

2.10.1 Distinctions between Cost Accounting and Management Accounting

	Cost Accounting	Management Accounting
1. Deals with	It deals with ascertainment, allocation, apportionment and accounting aspect of costs.	It deals with the effect and impact of cost on the business.
2. Base	It provides a base for management accounting.	It is derived from both cost accounting and financial accounting.

3. Role	It is helpful in collecting costing data for the management.	It is a greater degree of relevance and objectivity as the management - accountant has a clear idea of the types of costs and items requiring analysis and states the specific problems of business.
4. Status	The status of cost accountant comes after the management accountant.	Management accountant is senior in position to cost accountant.
5. Outlook	Cost accountant has a narrow approach. He has to refer to economic and statistical data for analysing cost effects.	Management accountant reports the effect of cost on the business along with cost analysis.
6. Tools & techniques	It has standard costing, variable costing, break even analysis etc. as the basic tools and techniques.	Along with these, the management accountant has funds and cash flow statements, ratio analysis etc. as his accounting tools and techniques.
7. Scope	It does not include financial accounting, tax planning and tax accounting.	It includes financial accounting, cost accounting tax planning and tax accounting.
8. Period of planning	It is concerned with short-term planning.	It is concerned with short range and long range planning and uses techniques like sensitivity analysis, probability structure etc. Its special field is evaluation of capital investment projects.
9. Assistance	It merely assists the management in its functions.	It assists and evaluates the management performance.
10. Approach	It is historical in its approach.	It is futuristic in its approach.
11. Installation	It can be installed without management accounting.	It needs financial and cost accounting as its base for its installation.

SHORT NOTES

1. Management Accounting

Management Accounting is comprised of two words 'Management' and 'Accounting'. It is the study of managerial aspect of accounting. The emphasis of management accounting is to redesign accounting in such a way that it is helpful to the management in formation of policy, control of execution and appreciation of effectiveness. It is that system of accounting which helps management in carrying out its functions more efficiently.

2. Inventory Control

Inventory is used to denote stock of raw materials, goods in the process of manufacture and finished products. Inventory has a special significance in accounting for determining correct income for a given period. Inventory control is significant as it involves large sums. The management should determine different levels of stocks, i.e., minimum level, maximum level, re-ordering level for inventory control.

3. Control Accounting

Control accounting is not a separate accounting system. Different systems have their control devices and these are used in control accounting. Standard costing and budgetary control can be exercised through variance analysis reports. In control accounting we can use internal check, internal audit, statutory audit and organisation and methods for control purposes.

4. Job Costing

Job costing is system of costing in which costs are ascertained in terms of specific job or order which are not comparable with each other. The unit of costing in this method is a job or a special work order.

5. Batch Costing

Batch Costing this method of costing is applied to industries where production is carried on in batches. Under this method, a batch of similar products is regarded as one job and the cost of this complete batch is ascertained. The total cost of the

batch is then divided by the total number of units in the batch in order to determine the cost per unit. This method is particularly suitable for industries engaged in confectionery, toy-making, medicines, readymade garments, spare parts, processed food, components manufacture, hardware articles like bolts, nuts, cycle parts, etc.

6. Process Costing

Process costing is the method of costing that is employed by the type of industries where a product passes through different processes, each distinct and well defined, it is desired to know the cost of production at each process. In order to know the cost at each stage or process of production, a separate account is opened for each process and when the material is transferred from one process to another, the cost incurred upto that process is also transferred to the succeeding process.

UNIT III

RATIO Analysis

i. Meaning of Financial Ratio. Classification, Advantages & Limitations of Ratio Analysis

ii. Liquidity Ratios; Leverage Ratios; Turnover Ratios;

iii. Profitability Ratios based on investment & sales

3.1 RATIO ANALYSIS

Introduction

The ratio analysis is one of the most powerful tools of financial analysis. It is the process of establishing and interpreting various ratios (quantitative relationship between figures and groups of figures). It is with the help of ratios, the financial statements can be analysed more clearly and decisions made from such analysis.

3.1.1 Meaning of Financial Ratio

Financial ratios are one of the most common tools of managerial decision making. A ratio is a comparison of one number to another—mathematically, a simple division problem. Financial ratios involve the comparison of various figures from the financial statements in order to gain information about a company's performance. It is the interpretation, rather than the calculation, that makes financial ratios a useful tool for business managers. Ratios may serve as indicators, clues, or red flags regarding noteworthy relationships between variables used to measure the firm's performance in terms of profitability, asset utilization, liquidity, leverage, or market valuation.

Meaning of Ratio

A ratio is simple arithmetical expression of the relationship of one number to another. It may be defined as the indicated quotient of two mathematical expressions.

According to Accountant's Handbook by Wixon, Kell and Bedford, "a ratio is an expression of the quantitative relationship between two numbers".

Ratio Analysis

Ratio analysis is the process of determining and presenting the relationship of items and group of items in the statements. According to Batty J. Management Accounting "Ratio can assist management in its basic functions of forecasting, planning coordination, control and communication".

It is helpful to know about the liquidity, solvency, capital structure and profitability of an organization. It is helpful tool to aid in applying judgement, otherwise complex situations.

Ratio analysis can represent following three methods

Ratio may be expressed in the following three ways :

1. Pure Ratio or Simple Ratio

It is expressed by the simple division of one number by another. For example , if the current assets of a business are Rs. 200000 and its current liabilities are Rs. 100000, the ratio of 'Current assets to current liabilities' will be 2:1.

2. 'Rate' or 'So Many Times

In this type , it is calculated how many times a figure is, in comparison to another figure. For example , if a firm's credit sales during the year are Rs. 200000 and its debtors at the end of the year are Rs. 40000 , its Debtors Turnover Ratio is 200000/40000 = 5 times. It shows that the credit sales are 5 times in comparison to debtors.

3. Percentage

In this type, the relation between two figures is expressed in hundredth. For example, if a firm's capital is Rs.1000000 and its profit is Rs.200000 the ratio of profit capital, in term of percentage, is 200000/1000000*100 = 20%

3.1.2 Nature of Ratio Analysis

In financial analysis, ratio is used as an index of yardstick for evaluating the financial position and performance of the firm. It is a technique of analysis and interpretation of financial statements. Ratio analysis helps in making decisions as it helps in establishing relationship between various ratios and interpret thereon. Ratio analysis helps analysts to make quantitative judgement about the financial position and performance of the firm. Ratio analysis involves following steps:

1. Relevant data selection from the financial statements related to the objectives of the analysis.
2. Calculation of required ratios from the data and presenting them either in pure ratio form or in percentage.
3. Comparison of derived different ratios with :
   (i) The ratio of the same concern over a period of years to know upward or downward trend or static position to help in estimating the future, or
   (ii) The ratios of another firm in same line, or
   (iii) The ratios of projected financial statements, or
   (iv) The ratios of industry average, or
   (v) The predetermined standards, or
   (vi) The ratios between the departments of the same concern assessing either the financial position or the profitability or both.

3.1.3 Interpretation of Ratios

The interpretation of ratios is an important factor. Though calculation of ratios is also important but it is only a clerical task whereas interpretation needs skill, intelligence and foresightedness. The inherent limitations of ratio analysis should be kept in mind while interpreting them. The impact of factors such as price level changes, change in accounting policies, window dressing etc., should also be kept in mind when attempting to interpret ratios.

A single ratio itself does not convey much of the sense. To make ratios useful, they have to be further interpreted. For example, say, the current ratio of 3 : 1 does not convey any sense unless it is interpreted and conclusion is drawn from it regarding the financial condition of the firm as to whether it is very strong, good, questionable or poor.

The interpretation of the ratios can be made in the following ways :

1. Single Absolute Ratio

Single ratios may be studied in relation to certain rules of thumb which are based upon well proven conventions as for example 2 : 1 is considered to be a good ratio for current assets to current liabilities.

2. Group of Ratios

Ratios may be interpreted by calculating a group of related ratios. A single ratio supported by other related additional ratios becomes more understandable and meaningful. For example, the ratio of current assets to current liabilities may be supported by the ratio of liquid assets to liquid liabilities to draw more dependable conclusions.

3. Historical Comparison

One of the easiest and most popular ways of evaluating the performance of the firm is to compare its present ratios with the past ratios called comparison overtime. When financial ratios are compared over a period of time, it gives an indication of the direction of change and reflects whether the firm's performance and financial position has improved, deteriorated or remained constant over a period of time. But while interpreting ratios from comparison over time, one has to be careful about the changes, if any, in the firm's policies and accounting procedures.

4. Projected Ratios

Ratios can also be calculated for future standards based upon the projected or proforma financial statements. These future ratios may be taken as standard for comparison and the ratios calculated on actual financial statements can be compared with the standard ratios to find out variances, if any. Such variances help in interpreting and taking corrective action for improvement in future.

5. Inter-firm Comparison

Ratios of one firm can also be compared with the ratios of some other selected firms in the same industry at the same point of time. This kind of comparison helps in evaluating relative financial position and performance of the firm. But while making use of such comparison one has to be very careful regarding the different accounting methods, policies and procedures adopted by different firms.

3.1.4 Guidelines or Precautions for use of Ratios

The calculation of ratios may not be difficult task but their use is not easy. The information on which these are based, the constraints of financial statements, objective for using them, the calibre of the analyst, etc. are important factors which influence the use of ratios. Following guidelines or factors may be kept in mind while interpreting various ratios :

1. Accuracy of Financial Statements

The ratios are calculated from the data available in financial statements. The reliability of ratios is linked to the accuracy of information in these statements. Before calculating ratios one should see whether proper concepts and conventions have been used for preparing financial statements or not. These statements should also be properly audited by competent auditors. The precautions will establish the reliability of data given in financial statements.

2. Objective or Purpose of Analysis

The type of ratios to be calculated will depend upon the purpose for which these are required. If the purpose is to study current financial position then ratios relating to current assets and current liabilities will be studied. The purpose of 'user' is also important for the analysis of ratios. A creditor, a banker, an investor, a shareholder, all have different objects for studying ratios. The purpose or object for which ratios are required to be studied should always be kept in mind for studying various ratios. Different objects may require the study of different ratios.

3. Selection of Ratios

Another precaution in ratio analysis is the proper selection of appropriate ratios. The ratios should match the purpose for which these are required. Calculation of large number of ratios without determining their need in the present context may confuse the things instead of solving them. Only those ratios should be selected which can throw proper light on the matter to be discussed.

4. Use of Standards

The ratios will give an indication of financial position only when discussed with reference to certain standards. Unless otherwise these ratios are compared with certain standards one will not be able to reach at conclusions. These standards may be rule of thumb as in case of current ratio (2:1) and acid-test ratio (1 : 1), may be industry standards, may be budgeted or projected ratios, etc. The comparison of calculated ratios with the standards will help the analyst in forming his opinion about financial situation of the concern.

5. Calibre of the Analyst

The ratios are only the tools of analysis and their interpretation will depend upon the calibre and competence of the analyst. He should be familiar with various financial statements and the significance of changes, etc. A wrong interpretation may create havoc for the concern since wrong conclusions may lead to wrong decisions. The utility of ratios is linked to the expertise of the analyst.

6. Ratios Provide Only a Base

The ratios are only guidelines for the analyst. He should not base his decisions entirely on them. He should study any other relevant information, situation in the concern, general economic environment, etc. before reaching final conclusions. The study of ratios in isolation may not always prove useful. A businessman will not afford a single wrong decision because it may have far-reaching consequences. The interpreter should use the ratios as guide and may try to solicit any other relevant information which helps in reaching a correct decision.

3.1.5 Use and Significance / Advantages of Ratio Analysis

The use of ratios is not confined to financial managers only. As discussed earlier, there are different parties interested in the ratio analysis for knowing the financial position of a firm for different purposes. The supplier of goods on credit, banks, financial institutions, investors, shareholders and management all make use of ratio analysis as a tool in evaluating the financial position and performance of a firm for granting credit, providing loans or making investments in the firm.

With the use of ratio analysis one can measure the financial condition of a firm and can point out whether the condition is strong, good, questionable or poor. The conclusions can also be drawn as to whether the performance of the firm is improving or deteriorating. Thus, ratios have wide applications and are of immense use today.

(a) Managerial Uses of Ratio Analysis

1. Helps in decision-making

Financial statements are prepared primarily for decision-making. But the information provided in financial statements is not an end in itself and no meaningful conclusion can be drawn from these statements alone. Ratio analysis helps in making decisions from the information provided in these financial statements.

2. Helps in financial forecasting and planning

Ratio Analysis is of much help in financial forecasting and planning. Planning is looking ahead and the ratios calculated for a number of years work as a guide for the future. Meaningful conclusions can be drawn for future from these ratios. Thus, ratio analysis helps in forecasting and planning.

3. Helps in communicating

The financial strength and weakness of a firm are communicated in a more easy and understandable manner by the use of ratios. The information contained in the financial statements is conveyed in a meaningful manner to the one for whom it is meant. Thus, ratios help in communication and enhance the value of the financial statements.

4. Helps in co-ordination

Ratios even help in co-ordination which is of utmost importance in effective business management. Better communication of efficiency and weakness of an enterprise results in better co-ordination in the enterprise.

5. Helps in Control

Ratio analysis even helps in making effective control of the business. Standard ratios can be based upon proforma financial statements and variances or deviations, if any, can be found by comparing the actual with the standards so as to take a corrective action at the right time. The weaknesses or otherwise, if any, come to the knowledge of the management which helps in effective control of the business.

6. Other Uses

There are so many other uses of the ratio analysis. It is an essential part of the budgetary control and standard costing. Ratios are of immense importance in the analysis and interpretation of financial statements as they bring the strength or weakness of a firm.

(b) Utility to Shareholders / Investors

An investor in the company will like to assess the financial position of the concern where he is going to invest. His first interest will be the security of his investment and then a return in the form of dividend or interest. For the first purpose he will try to asses the value of fixed assets and the loans raised against them.

The investor will feel satisfied only if the concern has sufficient amount of assets. Long-term solvency ratios will help him in assessing financial position of the concern. Profitability ratios, on the other hand, will be useful to determine profitability position. Ratio analysis will be useful to the investor in making up his mind whether present financial position of the concern warrants further investment or not.

(c) Utility to Creditors

The creditors or suppliers extend short-term credit to the concern. They are interested to know whether financial position of the concern warrants their payments at a specified time or not. The concern pays short- term creditors out of its current assets. If the current assets are quite sufficient to meet current liabilities then the creditor will not hesitate in extending credit facilities. Current and acid-test ratios will give an idea about the current financial position of the concern.

(d) Utility to Employees

The employees are also interested in the financial position of the concern especially profitability. Their wage increases and amount of fringe benefits are related to the volume of profits earned by the concern. The employees make use of information available in financial statements. Various profitability ratios relating to gross profit, operating profit, net profit, etc. enable employees to put forward their viewpoint for the increase of wages and other benefits.

(e) Utility to Government

Government is interested to know the overall strength of the industry. Various financial statements published by industrial units are used to calculate ratios for determining short-term, long-term and overall financial position of the concerns. Profitability indexes can also be prepared with the help of ratios.

Government may base its future policies on the basis of industrial information available from various units. The ratios may be used as indicators of overall financial strength of public as well as private sector. In the absence of the reliable economic information, governmental plans and policies may not prove successful.

(f) Tax Audit Requirements

Section 44 AB was inserted in the Income Tax Act by the Finance Act, 1984. Under this section every assessee engaged in any business and having turnover or gross receipts exceeding Rs. 40 lakh is required to get the accounts audited by a chartered accountant and submit the tax audit report before the due date for filing the return of income under Section 139 (1). In case of a professional, a similar report is required if the gross receipts exceed Rs. 10 lakh. Clause 32 of the Income Tax Act requires that the following accounting ratios should be given :

i) Gross Profit/Turnover

ii) Net Profit/Turnover

iii) Stock-in-trade/Turnover

iv) Material Consumed / Finished Goods Produced.

Further, it is advisable to compare the accounting ratios for the year under consideration with the accounting ratios for the earlier two years so that the auditor can make necessary enquiries, if there is any major variation in the accounting ratios.

3.1.6 Limitations of Ratio Analysis

The ratio analysis is one of the most powerful tools of financial management. Though ratios are simple to calculate and easy to understand, they suffer from some serious limitations :

1. Limited Use of a Single Ratio

A single ratio, usually, does not convey much of a sense. To make a better interpretation a number of ratios have to be calculated which is likely to confuse the analyst than help him in making any meaningful conclusion.

2. Lack of Adequate Standards

There are no well accepted standards or rules of thumb for all ratios which can be accepted as norms. It renders interpretation of the ratios difficult.

3. Inherent Limitations of Accounting

Like financial statements, ratios also suffer from the inherent weakness of accounting records such as their historical nature. Ratios of the past are not necessarily true indicators of the future.

4. Change of Accounting Procedure

Change in accounting procedure by a firm often makes ratio analysis misleading, e.g., a change in the valuation of methods of inventories, from FIFO to LIFO increases the cost of sales and reduces considerably the value of closing stocks which makes stock turnover ratio to be lucrative and an unfavourable gross profit ratio.

5. Window Dressing

Financial statements can easily be window dressed to present a better picture of its financial and profitability position to outsiders. Hence, one has to be very careful in making a decision from ratios calculated from such financial statements. But it may be very difficult for an outsider to know about the window dressing made by a firm.

6. Personal Bias

Ratio are only means of financial analysis and not an end in itself. Ratios have to be interpreted and different people may interpret the same ratio in different ways.

7. Uncomparable

Not only industries differ in their nature but also the firms of the similar business widely differ in their size and accounting procedures, etc. It makes comparison of ratios difficult and misleading. Moreover, comparisons are made difficult due to differences in definitions of various financial terms used in the ratio analysis.

8. Absolute Figures Distortive

Ratios devoid of absolute figures may prove distortive as ratio analysis is primarily a quantitative analysis and not a qualitative analysis.

9. Price Level Changes

While making ratio analysis, no consideration is made to the changes in price levels and this makes the interpretation of ratios invalid.

10. Ratios no Substitutes

Ratio analysis is merely a tool of financial statements. Hence, ratios become useless if separated from the statements from which they are computed.

11. Clues not Conclusions

Ratios provide only clues to analysts and not final conclusions. These ratios have to be interpreted by these experts and there are no standard rules for interpretation.

3.2 Classification of Financial Ratios

Ratio may be classified into the four categories as follows :

3.2.1 Liquidity Ratio

It refers to the ability of the firm to meet its current liabilities. The liquidity ratio, therefore, are also called 'Short-term Solvency Ratio'. These ratio are used to assess the short-term financial position of the concern. They indicate the firm's ability to meet its current obligation out of current resources.

In the words of **Saloman J. Flink,** "Liquidity is the ability of the firms to meet its current obligations as they fall due".

Liquidity ratio include two ratio :

(a) Current Ratio

(b) Quick Ratio or Acid Test Ratio

(a) Current Ratio

This ratio explains the relationship between current assets and current liabilities of a business.

- **Current Assets:** 'Current assets' includes those assets which can be converted into cash with in a year's time.

  Current Assets = Cash in Hand + Cash at Bank + B/R + Short Term Investment + Debtors(Debtors – Provision) + Stock(Stock of Finished Goods + Stock of Raw Material + Work in Progress) + Prepaid Expenses.

- **Current Liabilities:** 'Current liabilities' include those liabilities which are repayable in a year's time.

  Current Liabilities = Bank Overdraft + B/P + Creditors + Provision for Taxation + Proposed Dividend + Unclaimed Dividends + Outstanding Expenses + Loans Payable with in a Year.

Significance : According to accounting principles, a current ratio of 2:1 is supposed to be an ideal ratio.

It means that current assets of a business should, at least , be twice of its current liabilities. The higher ratio indicates the better liquidity position, the firm will be able to pay its current liabilities more easily. If the ratio is less than 2:1, it indicate lack of liquidity and shortage of working capital.

The biggest drawback of the current ratio is that it is susceptible to "window dressing". This ratio can be improved by an equal decrease in both current assets and current liabilities.

(b) Quick Ratio

Quick ratio indicates whether the firm is in a position to pay its current liabilities with in a month or immediately.

'Liquid Assets' means those assets, which will yield cash very shortly.

Liquid Assets = Current Assets – Stock – Prepaid Expenses

Significance :- An ideal quick ratio is said to be 1:1. If it is more, it is considered to be better. This ratio is a better test of short-term financial position of the company.

3.2.2 Leverage or Capital Structure Ratio

This ratio disclose the firm's ability to meet the interest costs regularly and Long term indebtedness at maturity.

These ratio include the following ratios :

(a) Debt Equity Ratio:- This ratio can be expressed in two ways :

First Approach : According to this approach, this ratio expresses the relationship between long term debts and shareholder's fund.

Formula :

Debt Equity Ratio = Long term Loans/Shareholder's Funds or Net Worth

- **Long Term Loans:-** These refer to long term liabilities which mature after one year. These include Debentures, Mortgage Loan, Bank Loan, Loan from Financial institutions and Public Deposits etc.
- **Shareholder's Funds :-** These include Equity Share Capital, Preference Share Capital, Share Premium, General Reserve, Capital Reserve, Other Reserve and Credit Balance of Profit & Loss Account.
- **Second Approach :** According to this approach the ratio is calculated as follows :

  Formula:

  Debt Equity Ratio = External Equities/internal Equities

  Debt equity ratio is calculated for using second approach.

Significance :- This Ratio is calculated to assess the ability of the firm to meet its long term liabilities. Generally, debt equity ratio of is considered safe.

If the debt equity ratio is more than that, it shows a rather risky financial position from the long-term point of view, as it indicates that more and more funds invested in the business are provided by long-term lenders.

The lower this ratio, the better it is for long-term lenders because they are more secure in that case. Lower than 2:1 debt equity ratio provides sufficient protection to long-term lenders.

(b) Debt to Total Funds Ratio : This Ratio is a variation of the debt equity ratio and gives the same indication as the debt equity ratio. In the ratio, debt is expressed in relation to total funds, i.e., both equity and debt.

Formula :

Debt to Total Funds Ratio = Long-term Loans/Shareholder's funds + Long-term Loans

Significance :- Generally, debt to total funds ratio of 0.67:1 (or 67%) is considered satisfactory. In other words, the proportion of long term loans should not be more than 67% of total funds.

A higher ratio indicates a burden of payment of large amount of interest charges periodically and the repayment of large amount of loans at maturity. Payment of interest may become difficult if profit is reduced. Hence, good concerns keep the debt to total funds ratio below 67%. The lower ratio is better from the long-term solvency point of view.

(c) Proprietary Ratio:- This ratio indicates the proportion of total funds provide by owners or shareholders.

Formula:

Proprietary Ratio = Shareholder's Funds/Shareholder's Funds + Long term loans

Significance :- This ratio should be 33% or more than that. In other words, the proportion of shareholders funds to total funds should be 33% or more.

A higher proprietary ratio is generally treated as an indicator of sound financial position from long-term point of view, because it means that the firm is less dependent on external sources of finance.

If the ratio is low it indicates that long-term loans are less secured and they face the risk of losing their money.

(d) Fixed Assets to Proprietor's Fund Ratio :- This ratio is also know as fixed assets to net worth ratio.

Formula :

Fixed Asset to Proprietor's Fund Ratio = Fixed Assets/Proprietor's Funds (i.e., Net Worth)

Significance : The ratio indicates the extent to which proprietor's (Shareholder's) funds are sunk into fixed assets. Normally , the purchase of fixed assets should be financed by proprietor's funds. If this ratio is less than 100%, it would mean that proprietor's fund are more than fixed assets and a part of working capital is provided by the proprietors. This will indicate the long-term financial soundness of business.

(e) Capital Gearing Ratio:- This ratio establishes a relationship between equity capital (including all reserves and undistributed profits) and fixed cost bearing capital.

Formula :

Capital Gearing Ratio = Equity Share Capital + Reserves + P&L Balance/ Fixed cost Bearing Capital

Whereas, Fixed Cost Bearing Capital = Preference Share Capital + Debentures + Long Term Loan

Significance : If the amount of fixed cost bearing capital is more than the equity share capital including reserves an undistributed profits), it will be called high capital gearing and if it is less, it will be called low capital gearing.

The high gearing will be beneficial to equity shareholders when the rate of interest/ dividend payable on fixed cost bearing capital is lower than the rate of return on investment in business.

Thus, the main objective of using fixed cost bearing capital is to maximize the profits available to equity shareholders.

(f) Interest Coverage Ratio:- This ratio is also termed as 'Debt Service Ratio'. This ratio is calculated as follows:

Formula :

Interest Coverage Ratio = Net Profit before charging interest and tax / Fixed Interest Charges

Significance :- This ratio indicates how many times the interest charges are covered by the profits available to pay interest charges.

This ratio measures the margin of safety for long-term lenders.

The higher the ratio, more secure the lenders in respect of payment of interest regularly. If profit just equals interest, it is an unsafe position for the lender as well as for the company also , as nothing will be left for shareholders.

An interest coverage ratio of 6 or 7 times is considered appropriate.

3.2.3 Activity Ratio Or Turnover Ratio

These ratio are calculated on the bases of 'cost of sales' or sales, therefore, these ratio are also called as 'Turnover Ratio'. Turnover indicates the speed or number of times the capital employed has been rotated in the process of doing business. Higher turnover ratio indicates the better use of capital or resources and in turn lead to higher profitability.

It includes the following :

(a) Stock Turnover Ratio : This ratio indicates the relationship between the cost of goods during the year and average stock kept during that year.

Formula:

Stock Turnover Ratio = Cost of Goods Sold / Average Stock

Here, Cost of goods sold = Net Sales – Gross Profit

Average Stock = Opening Stock + Closing Stock/2

Significance:- This ratio indicates whether stock has been used or not. It shows the speed with which the stock is rotated into sales or the number of times the stock is turned into sales during the year.

The higher the ratio, the better it is, since it indicates that stock is selling quickly. In a business where stock turnover ratio is high, goods can be sold at a low margin of profit and even than the profitability may be quit high.

(b) Debtors Turnover Ratio : This ratio indicates the relationship between credit sales and average debtors during the year :

Formula:

Debtor Turnover Ratio = Net Credit Sales / Average Debtors + Average B/R

While calculating this ratio, provision for bad and doubtful debts is not deducted from the debtors, so that it may not give a false impression that debtors are collected quickly.

Significance :- This ratio indicates the speed with which the amount is collected from debtors. The higher the ratio, the better it is, since it indicates that amount from debtors is being collected more quickly. The more quickly the debtors pay, the less the risk from bad- debts, and so the lower the expenses of collection and increase in the liquidity of the firm.

By comparing the debtors turnover ratio of the current year with the previous year, it may be assessed whether the sales policy of the management is efficient or not.

(c) Average Collection Period : This ratio indicates the time with in which the amount is collected from debtors and bills receivables.

Formula :

Average Collection Period = Debtors + Bills Receivable / Credit Sales per day

Here, Credit Sales per day = Net Credit Sales of the year / 365

Second Formula :-

Average Collection Period = Average Debtors *365 / Net Credit Sales

Average collection period can also be calculated on the bases of 'Debtors Turnover Ratio'. The formula will be:

Average Collection Period = 12 months or 365 days / Debtors Turnover Ratio

Significance :- This ratio shows the time in which the customers are paying for credit sales. A higher debt collection period is thus, an indicates of the inefficiency and negligency on the part of management. On the other hand, if there is decrease in debt collection period, it indicates prompt payment by debtors which reduces the chance of bad debts.

(d) Creditors Turnover Ratio :- This ratio indicates the relationship between credit purchases and average creditors during the year .

Formula:

Creditors Turnover Ratio = Net credit Purchases / Average Creditors + Average B/P

Note : If the amount of credit purchase is not given in the question, the ratio may be calculated on the bases of total purchase.

Significance :- This ratio indicates the speed with which the amount is being paid to creditors. The higher the ratio, the better it is, since it will indicate that the creditors are being paid more quickly which increases the credit worthiness of the firm.

(e) Working Capital Turnover Ratio :- This ratio reveals how efficiently working capital has been utilized in making sales.

Formula :-

Working Capital Turnover Ratio = Cost of Goods Sold / Working Capital

Here, Cost of Goods Sold = Opening Stock + Purchases + Carriage + Wages + Other Direct Expenses - Closing Stock

Working Capital = Current Assets – Current Liabilities

Significance :- This ratio is of particular importance in non-manufacturing concerns where current assets play a major role in generating sales. It shows the number of times working capital has been rotated in producing sales.

A high working capital turnover ratio shows efficient use of working capital and quick turnover of current assets like stock and debtors.

A low working capital turnover ratio indicates under-utilisation of working capital.

3.2.4 Profitability Ratios or Income Ratios

The main object of every business concern is to earn profits. A business must be able to earn adequate profits in relation to the risk and capital invested in it. The efficiency and the success of a business can be measured with the help of profitability ratio.

Profitability ratios are calculated to provide answers to the following questions:

(i) Is the firm earning adequate profits?

(ii) What is the rate of gross profit and net profit on sales?

(iii) What is the rate of return on capital employed in the firm?

(iv) What is the rate of return on proprietor's (shareholder's) funds?

(v) What is the earning per share?

Profitability ratio can be determined on the basis of either sales or investment into business.

A) Profitability Ratio Based on Sales

(a) Gross Profit Ratio : This ratio shows the relationship between gross profit and sales.

Formula :

Gross Profit Ratio = Gross Profit / Net Sales *100

Here, Net Sales = Sales – Sales Return

Significance : This ratio measures the margin of profit available on sales. The higher the gross profit ratio, the better it is. No ideal standard is fixed for this ratio, but the gross profit ratio should be adequate enough not only to cover the operating expenses but also to provide for deprecation, interest on loans, dividends and creation of reserves.

(b) Net Profit Ratio : This ratio shows the relationship between net profit and sales. It may be calculated by two methods:

Formula:

Net Profit Ratio = Net Profit / Net sales *100

Operating Net Profit = Operating Net Profit / Net Sales *100

Here, Operating Net Profit = Gross Profit – Operating Expenses such as Office and Administrative Expenses, Selling and Distribution Expenses, Discount, Bad Debts, Interest on short-term debts etc.

Significance :- This ratio measures the rate of net profit earned on sales. It helps in determining the overall efficiency of the business operations. An increase in the ratio over the previous year shows improvement in the overall efficiency and profitability of the business.

(c) Operating Ratio : This ratio measures the proportion of an enterprise cost of sales and operating expenses in comparison to its sales.

Formula:

Operating Ratio = Cost of Goods Sold + Operating Expenses / Net Sales *100

Where, Cost of Goods Sold = Opening Stock + Purchases + Carriage + Wages + Other Direct Expenses - Closing Stock

Operating Expenses = Office and Administration Exp. + Selling and Distribution Exp. + Discount + Bad Debts + Interest on Short- term loans.

'Operating Ratio' and 'Operating Net Profit Ratio' are inter-related. Total of both these ratios will be 100.

Significance:- Operating Ratio is a measurement of the efficiency and profitability of the business enterprise. The ratio indicates the extent of sales that is absorbed by the cost of goods sold and operating expenses. Lower the operating ratio is better, because it will leave higher margin of profit on sales.

(d) Expenses Ratio : These ratio indicate the relationship between expenses and sales. Although the operating ratio reveals the ratio of total operating expenses in relation to sales but some of the expenses include in operating ratio may be increasing while some may be decreasing. Hence, specific expenses ratio are computed by dividing each type of expense with the net sales to analyse the causes of variation in each type of expense.

The ratio may be calculated as :

a) Material Consumed Ratio = Material Consumed/Net Sales*100

b) Direct Labour cost Ratio = Direct labour cost / Net sales*100

c) Factory Expenses Ratio = Factory Expenses / Net Sales *100

((a), (b) and (c) mentioned above will be jointly called cost of goods sold ratio.

It may be calculated as:

Cost of Goods Sold Ratio = Cost of Goods Sold / Net Sales*100

d) Office and Administrative Expenses Ratio = Office and Administrative Exp./ Net Sales*100

e) Selling Expenses Ratio = Selling Expenses / Net Sales *100

f) Non- Operating Expenses Ratio = Non-Operating Exp./Net sales*100

Significance:- Various expenses ratio when compared with the same ratios of the previous year give a very important indication whether these expenses in relation to sales are increasing, decreasing or remain stationary. If the expenses ratio is lower, the profitability will be greater and if the expenses ratio is higher, the profitability will be lower.

B) Profitability Ratio Based on Investment in the Business

These ratio reflect the true capacity of the resources employed in the enterprise. Sometimes the profitability ratio based on sales are high whereas profitability ratio based on investment are low. Since the capital is employed to earn profit, these ratios are the real measure of the success of the business and managerial efficiency.

These ratio may be calculated into two categories :

I. Return on Capital Employed

II. Return on Shareholder's funds

I. Return on Capital Employed :- This ratio reflects the overall profitability of the business. It is calculated by comparing the profit earned and the capital employed to earn it. This ratio is usually in percentage and is also known as 'Rate of Return' or 'Yield on Capital'.

Formula :

Return on Capital Employed = Profit before interest, tax and dividends/ Capital Employed *100

Where, Capital Employed = Equity Share Capital + Preference Share Capital + All Reserves + P&L Balance + Long-Term Loans- Fictitious Assets (Such as Preliminary Expenses OR etc.) – Non-Operating Assets like Investment made outside the business.

Capital Employed = Fixed Assets + Working Capital

Advantages of 'Return on Capital Employed'

- Since profit is the overall objective of a business enterprise, this ratio is a barometer of the overall performance of the enterprise. It measures how efficiently the capital employed in the business is being used.
- Even the performance of two dissimilar firms may be compared with the help of this ratio.
- The ratio can be used to judge the borrowing policy of the enterprise.
- This ratio helps in taking decisions regarding capital investment in new projects. The new projects will be commenced only if the rate of return on capital employed in such projects is expected to be more than the rate of borrowing.

- This ratio helps in affecting the necessary changes in the financial policies of the firm.
- Lenders like bankers and financial institution will be determine whether the enterprise is viable for giving credit or extending loans or not.
- With the help of this ratio, shareholders can also find out whether they will receive regular and higher dividend or not.

II. Return on Shareholder's Funds

Return on Capital Employed Shows the overall profitability of the funds supplied by long term lenders and shareholders taken together. Whereas, Return on shareholders funds measures only the profitability of the funds invested by shareholders.

These are several measures to calculate the return on shareholder's funds :

(a) Return on total Shareholder's Funds : For calculating this ratio 'Net Profit after Interest and Tax' is divided by total shareholder's funds.

Formula:

Return on Total Shareholder's Funds = Net Profit after Interest and Tax / Total Shareholder's Funds

Where, Total Shareholder's Funds = Equity Share Capital + Preference Share Capital + All Reserves + P&L A/c Balance –Fictitious Assets

Significance : This ratio reveals how profitably the proprietor's funds have been utilized by the firm. A comparison of this ratio with that of similar firms will throw light on the relative profitability and strength of the firm.

(b) Return on Equity Shareholder's Funds : Equity Shareholders of a company are more interested in knowing the earning capacity of their funds in the business. As such, this ratio measures the profitability of the funds belonging to the equity shareholder's.

Formula :

Return on Equity Shareholder's Funds = Net Profit (after int., tax & preference dividend) / Equity Shareholder's Funds *100

Ratio Analysis. Where, Equity Shareholder's Funds = Equity Share Capital + All Reserves + P&L A/c

Balance – Fictitious Assets

Significance : This ratio measures how efficiently the equity shareholder's funds are being used in the business. It is a true measure of the efficiency of the management since it shows what the earning capacity of the equity shareholders funds. If the ratio is high, it is better, because in such a case equity shareholders may be given a higher dividend.

(**c**) **Earning Per Share (E.P.S.) :** This ratio measure the profit available to the equity shareholders on a per share basis. All profit left after payment of tax and preference dividend are available to equity shareholders.

Formula :

Earning Per Share = Net Profit – Dividend on Preference Shares / No. of Equity Shares

Significance:- This ratio helpful in the determining of the market price of the equity share of the company. The ratio is also helpful in estimating the capacity of the company to declare dividends on equity shares.

(**d**) **Dividend Per Share (D.P.S.**):- Profits remaining after payment of tax and preference dividend are available to equity shareholders.

But of these are not distributed among them as dividend . Out of these profits is retained in the business and the remaining is distributed among equity shareholders as dividend. D.P.S. is the dividend distributed to equity shareholders divided by the number of equity shares.

Formula :

D.P.S. = Dividend paid to Equity Shareholder's / No. of Equity Shares *100

(e) Dividend Payout Ratio or D.P. : It measures the relationship between the earning available to equity shareholders and the dividend distributed among them.

Formula :

D.P. = Dividend paid to Equity Shareholders/ Total

Net Profit belonging to Equity Shareholders*100

OR

D.P. = D.P.S. / E.P.S. *100

(**f**) **Earning and Dividend Yield :-** This ratio is closely related to E.P.S. and D.P.S. While the E.P.S. and D.P.S. are calculated on the basis of the book value of shares, this ratio is calculated on the basis of the market value of share

(g) Price Earning (P.E.) Ratio : Price earning ratio is the ratio between market price per equity share & earnings per share. The ratio is calculated to make an estimate of appreciation in the value of a share of a company & is widely used by investors to decide whether or not to buy shares in a particular company.

Significance :- This ratio shows how much is to be invested in the market in this company's shares to get each rupee of earning on its shares. This ratio is used to measure whether the market price of a share is high or low.

IMPORTANT FORMULAS IN RATIO ANALYSIS

1. Liquidity Ratios

A) Current Ratio = Current Assets / Current Liabilities ..... 2 : 1

B) Quick Ratio or Acid Test Ratio = Quick Assets / Current Liabilities ..... 1 : 1

C) Super Quick Ratio or Cash Ratio = Cash + Marketable securities / Current Liabilities ..... 1 : 2

D) Payable Turnover Ratio = Cost of goods sold / Accounts payable

2. Activity Ratios / Turnover Ratios / Efficiency Ratios

A) Inventory Turnover Ratio = Cost of Goods Sold / Average Inventory

B) Debtors Turnover Ratio = Net Credit sales / Average Debtors

C) Fixed Assets Turnover Ratio = Net Sales / Fixed Assets

D) Total Assets Turnover Ratio = Net Sales / Total Assets

3. Leverage Ratios

A) Debt Equity Ratio = Long-term Debts / Shareholders Fund

B) Debt Assets Ratio = Total Debts / Total Assets

C) Interest Coverage Ratio = EBIT / Interest Charges

4. Profitability Ratios

A) Gross Profit Ratio = Gross Profit / Net sales × 100

B) Net Profit Ratio = Net Profit / Net Sales × 100

C) Return on Capital employed or Return on Investments or Rate of return = PBIT / Capital employed × 100

D) Return on Net Worth = Profit after Tax / Net Worth × 100

4. Other Ratios

A) Operating Ratio = COGS + Operating Expenses / Net Sales × 100

B) Operating Profit Ratio = Operating Profit / Net Sales × 100

C) Proprietary Ratio = Shareholder Funds / Total Assets.

D) Administrative Expenses Ratio = Administrative Expenses / Sale × 100.

E) Selling & Distribution Expenses Ratio = S & D Expenses / Sales × 100.

PROBLEMS

1. From the following information, calculate liquidity ratios for the two companies and give your interpretation of the liquidity position of the companies as revealed by the ratios.

	(Rupees in Lakhs)	
	Company X	**Company Y**
Cash	360	280
Debtors	2,800	6,400
Inventory	4,000	12,000
Bills payable	600	2,000
Creditors	1,600	10,000
Accrued Expenses	200	250
Tax payable	1,200	1,000

Solution :

(i) Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

Current Assets	X	Y	Current Liabilities	X	Y
Cash	360	280	Bills payable	600	2,000
Debtors	2,800	6,400	Creditors	1,600	10,000
Inventory	4,000	12,000	Accured expenses	200	250
			Tax payable	1,200	1,000
	7,160	**18,680**		**3,600**	**13,250**

Current Ratio for X Co = $\frac{7,160}{3,600}$ = 1.98:1

Current Ratio for Y Co = $\frac{18,680}{13,250}$ = 1.41:1

(ii) Quick Ratio = $\frac{\text{Quick Assets}}{\text{Current Liabilities}}$

Quick Assets = Current Assets – [Stock and Prepaid expenses]
Quick ratio for x co = 7,160 – 4,000 = Rs. 3,160
Quick ratio for y co = 18,680 – 12,000 = Rs. 6,680

Quick ratio for x co = $\frac{3,160}{3,600}$ = 0.877

Quick ratio for y co = $\frac{6,680}{13,250}$ = 0.50

(iii) Absolute liquidity ratio = $\frac{\text{Absolute Liquid Assets}}{\text{Current Liabilities}}$

Absolute liquid assets = QA – [Debtors + B/R]
Absolute liquid asses for x co. = 3,160 – 2,800 = 360
Absolute liquid assets for y co. = 6,680 – 6,400 = 280

Absolute Liquidity Ratio

x co = $\frac{360}{3,600}$ = 0.1

y co = $\frac{280}{13,250}$ = 0.02

2. You are given Trading and Profit & Loss Account of Mahesh Company limited for the year ended 31st December 1992.

Trading and Profit & Loss Account

Dr. ***Cr.***

Particulars	***Rs.***	***Particulars***	***Rs.***
To Opening Stock	30,000	By Net Sales	1,10,000
To Purchases	60,000	By Closing Stock	20,000
To Wages	10,000		
To Gross Profit (c/d)	30,000		
	1,30,000		1,30,000
To Administrative Expenses	10,000	By Gross Profit (b/d)	30,000
To Selling & Distribution Expenses	5,000	By Sundry Receipt	5,000
To Net Profit	20,000		
	35,000		35,000

Calculate :

1. Gross Profit Ratio

2. Net Profit Ratio

3. Operating Ratio

4. Operating Profit Ratio

Ans :

1. Gross Profit Ratio $= \frac{\text{Gross profit}}{\text{Net sales}} \times 100$

$$\text{GP Ratio} = \frac{30,000}{1,10,000} \times 100$$

$$\text{GP Ratio} = 27.27\%$$

2. Net Profit Ratio :

$$\text{NP Ratio} = \frac{\text{Net profit}}{\text{Net sales}} \times 100$$

$$\text{NP Ratio} = \frac{20,000}{1,10,000} \times 100$$

$$\therefore \quad \text{NP Ratio} = 18.18\%$$

3. Operating Ratio :

$$\text{Operating Ratio} = \frac{\text{Cost of goods sold} + \text{Operating expenses}}{\text{Net sales}} \times 100$$

Cost of goods sold = Opening stock + Purchases + Direct expenses – Closing stock

COGS = 30,000 + 60,000 + 10,000 – 20,000

= 1,00,000 – 20,000

COGS = 80,000

$$\text{Operating Ratio} = \frac{\text{COGS} + \text{Operating expenses}}{\text{Net sales}} \times 100$$

$$\text{Operating Ratio} = \frac{80{,}000 + 15{,}000}{1{,}10{,}000} \times 100$$

$$= \frac{95{,}000}{1{,}10{,}000} \times 100$$

∴ Operating Ratio = 86.36%

4. Operating Profit Ratio :

100 – Operating Ratio

= 100 – 86.36

Operating Profit Ratio = 13.64%.

3. From the following Trading and Profit & Loss A/c of Rim Zim Limited for the year ended 31st March 1993.

Calculate (i) Gross Profit Ratio (ii) Net Profit Ratio (iii) Operating Ratio (iv) Operating Profit Ratio.

Rim Zim Company

Dr. ***Cr.***

Particulars	*Amount*	*Particulars*		*Amount*
To Opening Stock	5,00,000	By Sales		
To Purchases	11,00,000	Cash	3,00,000	
To Wages	3,00,000	Credit	17,00,000	20,00,000
To Factory Overheads	2,00,000	By Closing Stock		6,00,000
To Gross Profit (c/d)	5,00,000			
	26,00,000			26,00,000

To Administration Expenses	75,000	By Gross Profit (b/d)	5,00,000
To Selling & Distribution Exp.	50,000	By Dividend on Investment	10,000
To Interest on Debentures	20,000	By Profit on Sale of Furniture	20,000
To Depreciation	60,000		
To Loss on Sale of Motorcar	5,000		
To Net Profit	3,20,000		
	5,30,000		5,30,000

Ans :

1. Gross Profit Ratio = $\frac{\text{Gross profit}}{\text{Net sales}} \times 100$

$$\text{Gross Profit Ratio} = \frac{5{,}00{,}000}{20{,}00{,}000} \times 100$$

∴ GP Ratio = 25%

2. Net Profit Ratio :

$$\text{NP Ratio} = \frac{\text{Net profit}}{\text{Net sales}} \times 100$$

$$= \frac{3{,}20{,}000}{20{,}00{,}000} \times 100$$

∴ NP Ratio = 16%

3. Operating Ratio = $\frac{\text{Cost of goods sold} + \text{Operating expenses}}{\text{Net sales}} \times 100$

(i) Cost of goods sold = Opening stock + Purchases + Direct expenses – Closing stock

= 5,00,000 + 11,00,000 + 3,00,000 + 2,00,000 – 6,00,000

21,00,000 – 6,00,000 = 15,00,000

OR

(i) COGS = Net Sales – Gross Profit

= 20,00,000 – 5,00,000 = 15,00,000

(ii) Operating Expenses = Administrative Expenses + Selling and Distribution Expenses

Operating Expenses = 75,000 + 50,000 = 1,25,000

$$\text{Operating Ratio} = \frac{15,00,000 + 1,25,000}{20,00,000} \times 100$$

$$= \frac{16,25,000}{20,00,000} \times 100$$

Operating Ratio = 81.25%

(4) Operating Profit Ratio

= 100% – Operating Ratio

= 100% – 81.25%

∴ Operating Profit Ratio = 18.75%

4. You are given Trading and Profit and Loss Account of Mahesh Company Limited for the year ending 31-12-1992.

Dr. ***Cr.***

Particulars	***Amount***	***Particulars***	***Amount***
To Opening Stock	76,250	By Sales	5,00,000
To Purchases	3,15,250	By Closing Stock	98,500
To Factory Expenses	7,000		
To Gross Profit (c/d)	2,00,000		
	5,98,500		5,98,500
To Administrative Expenses	1,01,000	By Gross Profit (b/d)	2,00,000
To Selling & Distribution Expenses	12,000	By Non-operating income	6,000
To Non-Operating Expenses	9,000		
To Net Profit	84,000		
	2,06,000		2,06,000

Calculate General Profitability Ratio

Ans :

1. $\text{Gross Profit Ratio} = \frac{\text{Gross profit}}{\text{Net sales}} \times 100$

$= \frac{2,00,000}{5,00,000} \times 100$

= 40%

2. $\text{Net Profit Ratio} = \frac{\text{Net profit}}{\text{Net sales}} \times 100$

$= \frac{84,000}{5,00,000} \times 100$

= 16.8%

3. $\text{Operating Ratio} = \frac{\text{Cost of goods sold} + \text{Operating expenses}}{\text{Net sales}} \times 100$

(i) Operating expenses = Administrative Expenses + Selling & Distribution Expenses

= 1,01,000 + 12,000

= 1,13,000

Cost of goods sold = Net sales – Gross Profit

= 5,00,000 – 2,00,000

= 3,00,000

$\text{Operating Ratio} = \frac{3,00,000 + 1,13,000}{5,00,000} \times 100$

$= \frac{4,13,000}{5,00,000} \times 100$

= 82.6%

4. Operating Profit Ratio

100% – Operating Ratio

100% – 82.6%

= 17.4%

5. Calculation of Expenses Ratio :

(i) $\text{Cost of Goods Sold Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Net Sales}} \times 100$

$= \frac{3,00,000}{5,00,000} \times 100$

= 60%

(ii) Selling and Distribution Expenses Ratio

$$= \frac{\text{Selling and Distribution Expenses}}{\text{Net Sales}} \times 100$$

$$= \frac{12,000}{5,00,000} \times 100$$

$$= 2.4\%$$

(iii) Administrative Expenses Ratio

$$= \frac{\text{Administrative Expenses}}{\text{Net Sales}} \times 100$$

$$= \frac{1,01,000}{5,00,000} \times 100$$

$$= 20.2\%.$$

5. You are given the Balance Sheet of XYZ Co. Ltd. as on 31-3-1996.

Liabilities	*Amount*	*Assets*	*Amount*
Equity share capital	2,00,000	Fixed Assets	3,00,000
9% Preference Share Capital	1,50,000	Current Assets	2,00,000
7% Debentures	1,00,000	Preliminary Expenses	20,000
Bank over draft	50,000		
Reserves	80,000		
Profit and Loss A/c	1,20,000		
Other Current Liabilities	20,000		
	5,20,000		5,20,000

Additional Information :

1. Net profit after depreciation Rs. 1,60,000

2. Tax Rate is 50%

Calculate

1. Return on Capital Employed

2. Return on Investments

3. Return on Total Assets

4. Return on Equity Funds

5. Return on Fixed Assets

Ans :

	Rs.
Net profit after depreciation	1,60,000
Less : Interest (1,00,000 × $\frac{7}{100}$)	7,000
Net profit after depreciation & Interest	1,53,000
Less : Tax @ 50% (1,53,000 × $\frac{50}{100}$)	76,500
Net profit after interest & Taxes	76,500
Less : Dividend (1,50,000 × $\frac{9}{100}$)	13,500
Net profit available to Equity share holders	63,000

(I) Return on Capital Employed (ROC) :

$$\text{ROC} = \frac{\text{Net profit after depreciation before interest, Tax and Dividend}}{\text{Capital Employed}} \times 100$$

Capital Employed = Equity Share Capital + Preference Share Capital + Debentures + Reserves – Ficticious Assets

= 2,00,000 + 1,50,000 + 1,00,000 + 80,000 + 1,20,000 – 20,000

= 6,50,000 – 20,000

= 6,30,000

$$\text{ROC} = \frac{1,60,000}{6,30,000} \times 100$$

$\therefore$ ROC = 25.40%

(II) Return on Investments (ROI) :

$$\text{ROI} = \frac{\text{Net profit after interest and Taxes}}{\text{Share holders fund}} \times 100$$

Share Holders Fund : Equity share capital + Reserves + Pref. Share + P & L A/c – Ficticious Assets

= 1,50,000 + 2,00,000 + 80,000 + 1,20,000 – 20,000

= 5,50,000 – 20,000

= 5,30,000

$$\text{ROI} = \frac{76,500}{5,30,000} \times 100$$

$\therefore$ ROI = 14.43%

(III) Return on Equity Funds (ROE) :

$$ROE = \frac{\text{Net profit available to equity share holders}}{\text{Equity share holders fund}} \times 100$$

Equity share holders funds : Equity share capital + Reserves + P & L Account (Cr) – Ficticious Assets

= 2,00,000 + 80,000 + 1,20,000 – 20,000

= 4,00,000 – 20,000

= 3,80,000

$$ROE = \frac{63{,}000}{3{,}80{,}000} \times 100$$

$\therefore$ ROE = 16.58%

(IV) Return on Total Assets (ROA) :

$$ROA = \frac{\text{Net profit after interest \& Taxes}}{\text{Total Assets}} \times 100$$

Total Assets = Fixed Assets + Current Assets

= 3,00,000 + 2,00,000

= 5,00,000

$$ROA = \frac{76{,}500}{5{,}00{,}000} \times 100$$

$\therefore$ ROA = 15.3%

(V) Return on Fixed Assets (ROF) :

$$ROF = \frac{\text{Net profit after interest \& Taxes}}{\text{Fixed Assets}} \times 100$$

$$ROF = \frac{76{,}500}{3{,}00{,}000} \times 100$$

$\therefore$ ROF = 25.5%

6. You are given the Balance Sheet of Somu Company Ltd. as on 31st December 1992.

Liabilities	*Amount*	*Assets*	*Amount*
10,000 Equity shares at Rs.10/-each	1,00,000	Fixed Assets	2,50,000
9% Pref. shares at Rs. 100/- each	1,00,000	Current Assets	1,30,000
7% Debentures	1,00,000	Ficticious Assets	20,000
Reserves	30,000		
P & L A/c (Cr) Balance	20,000		
Sundry Creditors	20,000		
Other Liabilities	30,000		
	4,00,000		4,00,000

Additional Information :

1. ***Net profit after depreciation Rs. 40,000***
2. ***Tax Rate 50%***
3. ***Board of directors declared a dividend of 6% to Equity share holders***
4. ***Market price of the share Rs. 10 per share***

Calculate

1. ***Return on capital Employed.***
2. ***Returns on Investments***
3. ***Return on Equity***
4. ***Return on Assets***
5. ***Return on Fixed Assets***
6. ***Earning Per Share***
7. ***Earning Yield Ratio***
8. ***Price-earning Ratio***
9. ***Dividend Per Share***
10. ***Dividend Yield Ratio***
11. ***Pay out Ratio***

Ans :

	Rs.
Net profit after depreciation	40,000
Less : Interest (1,00,000 × 7%)	7,000
Net profit after depreciation and interest	33,000
Less : Taxes @ 50% (33,000 × 50%)	16,500
Net profit after depreciation, Interest and Tax	16,500
Less : Preference dividend (1,00,000 × $\frac{9}{100}$)	9,000
Net profit available to equity share holders	7,500

(I) Return on Capital Employed (ROC) :

$$ROC = \frac{\text{Net profit after depreciation before interest, Tax and Dividend}}{\text{Capital Employed}} \times 100$$

Capital Employed = Equity Share Capital + Preference Share Capital + Reserves + P & L (Cr) + Debentures – Ficticious Assets

= 1,00,000 + 1,00,000 + 30,000 + 1,00,000 + 20,000 – 20,000

= 3,50,000 – 20,000

= 3,30,000

$$ROC = \frac{40,000}{3,30,000} \times 100$$

$\therefore$ ROC = 12.12%

(II) Return on Investments (ROI) / Net Worth :

$$ROI = \frac{\text{Net profit after interest and Taxes}}{\text{Share holders fund}} \times 100$$

Share Holders Fund : Equity share capital + Pref. Share Capital + Reserves + P & L A/c – Ficticious Assets

= 1,00,000 + 1,00,000 + 30,000 + 20,000 – 20,000

= 2,50,000 – 20,000

= 2,30,000

$$ROI = \frac{16,500}{2,30,000} \times 100$$

$\therefore$ ROI = 7.2%

Return on Equity Funds (ROE) :

$$ROE = \frac{\text{Net profit available to equity share holders}}{\text{Equity share holders fund}} \times 100$$

Equits share holders funds : Equity share capital + Reserves + P & L Account (Cr) – Ficticious Assets

= 1,00,000 + 30,000 + 20,000 – 20,000

1,50,000 – 20,000 = 1,30,000

$$ROE = \frac{7,500}{1,30,000} \times 100$$

$\therefore$ ROE = 5.76%

Return on Total Assets (ROA) :

$$ROA = \frac{\text{Net profit after interest \& Taxes}}{\text{Total Assets}} \times 100$$

Total Assets = Fixed Assets + Current Assets

2,50,000 + 1,30,000 = 3,80,000

$$ROA = \frac{16,500}{3,80,000} \times 100$$

$\therefore$ ROA = 4.34%

Return on Fixed Assets (ROF) :

$$ROF = \frac{\text{Net Profit after interest and Taxes}}{\text{Total Fixed Assets}} \times 100$$

$$ROF = \frac{16,500}{2,50,000}$$

$\therefore$ ROF = 6.6%

Earnings Per Share (EPS) :

$$EPS = \frac{\text{Earnings available to equity share holders}}{\text{No. of Equity share holders}}$$

$$EPS = \frac{7,500}{10,000}$$

$\therefore$ EPS = 0.75%

Earning Yield Ratio (EYR) :

$$EYR = \frac{\text{Earnings per share}}{\text{Market price per share}} \times 100$$

$$EYR = \frac{0.75}{10} \times 100$$

$\therefore$ EYR = 7.5%

Price Earning Ratio (P/E Ratio) :

$$\text{P/E Ratio} = \frac{\text{Market price per share}}{\text{Earnings per share}}$$

$$\text{P/E Ratio} = \frac{10}{0.75} \times 100$$

$\therefore$ P/E Ratio = 13.33 times

Dividend Per Share (DPS) :

$$\text{DPS} = \frac{\text{Dividend available to equity share holders}}{\text{No.of equity share holders}}$$

Dividend available to equity share holders

$$\text{Equity Share Capital} \times \frac{\text{Dividend Rate}}{100}$$

$$1{,}00{,}000 \times \frac{6}{100} \rightarrow \text{Rs. } 6{,}000$$

$$\text{DPS} = \frac{6{,}000}{10{,}000}$$

$\therefore$ DPS = 0.6.

Dividend Yield Ratio (DYR) :

$$\text{DYR} = \frac{\text{Dividend per share}}{\text{Market price per share}} \times 100$$

$$\text{DYR} = \frac{0.6}{10} \times 100$$

$\therefore$ DYR = 6%

Payout Ratio :

$$\text{Payout Ratio} = \frac{\text{Dividend per share}}{\text{Earnings per share}} \times 100$$

$$= \frac{0.6}{0.75} \times 100$$

Payout Ratio = 80%.

7. From the information given below calculate

(1) EPS (2) EYR (3) P/E Ratio (4) DPS (5) DYR (6) Payout Ratio

1000 Equity shares at Rs. 100/- each	***Rs. 1,00,000***
Reserves	***50,000***
Profit available to equity share holders	***10,000***
Market price per share	***Rs. 25/-***
Board of directors declared a dividend to equity holders	***5%***

Ans :

Earnings Per Share (EPS) :

$$\text{EPS} = \frac{\text{Earnings available to equity share holders}}{\text{No.of Equity share holders}} \times 100$$

$$\text{EPS} = \frac{10{,}000}{10{,}000} \times 100$$

$\therefore$ EPS = Rs. 10

Earnings Yield Ratio :

$$\text{EYR} = \frac{\text{Earnings per share}}{\text{Market price per share}} \times 100$$

$$\text{EYR} = \frac{10}{25} \times 100$$

$\therefore$ EYR = 40%

Price Earning Ratio (P/E Ratio) :

$$\text{P/E Ratio} = \frac{\text{Market price per share}}{\text{Earnings per share}}$$

$$\text{P/E Ratio} = \frac{25}{10}$$

P/E Ratio = 2.5 times

Dividend Per Share (DPS) :

$$\text{DPS} = \frac{\text{Dividend available to equity share holders}}{\text{No.of Equity share holders}}$$

Dividend availabel to equity share holders

$$DPS = \text{Equity share capital} \times \frac{\text{Ratio}}{100}$$

$$1{,}00{,}000 \times \frac{5}{100}$$

$$DPS = \frac{5{,}000}{1{,}000}$$

$\therefore$ DPS = 5.

Dividend Yield Ratio (DYR) :

$$DYR = \frac{\text{Dividend per share}}{\text{Market price per share}} \times 100$$

$$DYR = \frac{5}{25} \times 100$$

$\therefore$ DYR = 20%

Payout Ratio :

$$\text{Payout Ratio} = \frac{\text{Dividend per share}}{\text{Earnings per share}} \times 100$$

$$= \frac{5}{10} \times 100$$

Payout Ratio = 50%.

8. Net Sales Rs. 10,00,000

Gross Profit 30% on sales

Stock turnover Ratio = 7 times

Calculate closing stock value if it is 30,000 excess of opening stock.

Ans :

$$\text{Gross profit ratio} = \frac{\text{Gross profit}}{\text{Net sales}} \times 100$$

$$0.30 = \frac{\text{Gross profit}}{10{,}00{,}000}$$

Gross profit = 3,00,000

Cost of Goods Sold = Net Sales – Gross Profit

= 10,00,000 – 3,00,000

$\therefore$ COGS = 7,00,000

$$\text{Stock turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Averge stock}}$$

$$7 = \frac{7{,}00{,}000}{\text{Average stock}}$$

$$\therefore \text{ Average stock} = \frac{7{,}00{,}000}{7}$$

Average stock = Rs. 1,00,000.

$$\text{Average stock} = \frac{\text{Opening stock} + \text{Closing stock}}{2}$$

$$1{,}00{,}000 \ \frac{x + (x + 30{,}000)}{2}$$

2,00,000 = x + (x + 30,000)

2,00,000 = 2x + 30,000

2x = 2,00,000 – 30,000

2x = 1,70,000

$$x = \frac{1{,}70{,}000}{2}$$

$\therefore$ Opening Stock = 85,000

Closing Stock = 85,000 + 30,000

Closing Stock = 1,15,000

9. The following are the summarised profit and loss account of Hind Products Ltd. for the year ending 31st December 1989 and the Balance Sheet as on the date

Profit and Loss Account

Dr. ***Cr.***

Particulars	*Amount*	*Particulars*	*Amount*
To Opening stock	99,500	By Net Sales (Cr)	8,50,000
To Purchases (Cr)	5,45,250	By Closing Stock	1,49,000
To Direct Expenses	14,250		
To Gross Profit	3,40,000		
	9,99,000		9,99,000

To Operating Expenses	1,95,000	By Gross Profit	3,40,000
To Non-operating exp.	4,000	By Non-operating income	9,000
To Net profit	1,50,000		
	3,49,000		3,49,000

Balance Sheet

Liabilities	*Amount*	*Assets*	*Amount*
Issued capital		Land & Building	1,50,000
2000 shares of Rs. 100 each	2,00,000	Plant & Machinery	80,000
Reserves	90,000	Stock in Trade	1,49,000
Other Current Liabilities	90,000	Sundry Debtors	41,000
Profit and Loss Account	60,000	Cash and Bank Balance	30,000
Bills Payable	40,000	Bills Receivable	30,000
	4,80,000		4,80,000

You are required to calculate :

1. Gross Profit Ratio ***2. Net Profit Ratio***

3. Opertaing Ratio ***4. Operating Profit Ratio***

5. Return on Capital Employed ***6. Stock Turnover Ratio***

7. Debtors Turnover Ratio ***8. Creditors Turnover Ratio***

9. Fixed Assets Turnover Ratio ***10. Total Assets Turnover Ratio***

11. Net Profit / Capital Employed Ratio.

Additional Information :

1. Average Stock = 1,04,250

2. Average Debtors = 85,000

3. Average Creditors = 80,000

Ans :

(1) Calculating Gross Profit Ratio :

$$\text{Gross Profit Ratio} = \frac{\text{Gross profit}}{\text{Net sales}} \times 100$$

$$= \frac{3,40,000}{8,50,000} \times 100$$

$$= 40\%$$

(2) Calculating Net Profit Ratio :

$$\text{Net Profit Ratio} = \frac{\text{Net profit}}{\text{Net sales}} \times 100$$

$$= \frac{1,50,000}{8,50,000} \times 100$$

$$= 17.65\%$$

(3) Calculating Operating Ratio :

$$\text{Operating Ratio} = \frac{\text{Cost of goods sold} + \text{Operating expenses}}{\text{Net Sales}} \times 100$$

Cost of goods sold = Net Sales – Gross Profit

= 8,50,000 – 3,40,000

= 5,10,000

Operating Expenses = 1,95,000

$$\text{Operating Ratio} = \frac{5,10,000 + 1,95,000}{8,50,000} \times 100$$

$$= \frac{7,05,000}{8,50,000} \times 100$$

$$= 82.94\%$$

(4) Calculating Operating Profit Ratio :

Operating Profit Ratio = 100% – Operating Ratio

= 100% – 82.94%

= 17.06%

(5) Calculating ROC (Return on Capital Employed) :

$$\text{ROC} = \frac{\text{Net profit after depreciation before Interest Tax \& Dividends}}{\text{Capital Employed}}$$

Capital Employed = Equity Share Capital + Preference Share Capital + Reserves + Profit & Loss Cr Balance + Debentures – Ficticious Assets

= 2,00,000 + 90,000 + 60,000 – Nil

= 3,50,000 – Nil

= 3,50,000.

$$ROC = \frac{1,50,000}{3,50,000} \times 100$$

$$= 42.86\%$$

(6) Calculating Stock Turnover Ratio :

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average stock}}$$

$$= \frac{5,10,000}{1,24,250}$$

$$= 4.10 \text{ times}$$

(7) Calculating Debtors Turnover Ratio :

$$\text{Debtors Turnover Ratio} = \frac{\text{Net credit sales}}{\text{Average Trade Debtors}}$$

$$= \frac{8,50,000}{85,000} = 10 \text{ times.}$$

(8) Calculating Creditors Turnover Ratio :

$$\text{Creditors Turnover Ratio} = \frac{\text{Net credit purchases}}{\text{Average trade creditors}}$$

$$= \frac{5,45,250}{80,000} = 6.82 \text{ times.}$$

(9) Calculating Fixed Assets Turnover Ratio :

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Net sales}}{\text{Fixed assets}}$$

$$= \frac{8,50,000}{2,30,000} = 3.7 \text{ times.}$$

(10) Calculating Total Assets Turnover Ratio :

$$\text{Total Assets Turnover Ratio} = \frac{\text{Net sales}}{\text{Total assets}}$$

$$= \frac{8,50,000}{4,80,000} = 1.77 \text{ times.}$$

(11) Calculating Net Profit / Capital Employed Ratio :

$$\frac{\text{Net profit}}{\text{Capital employed}} = \frac{1,50,000}{3,50,000} = 0.429 \text{ times.}$$

10. Current Ratio = 2.5 ; 1
Working Capital = 50,000 calculate
Current Assets and Current Liabilities.

Ans :

Given Current Ratio $= \frac{CA}{CL}$ ..... (1)

Working Capital = CA – CL

50,000 = CA – CL

50,000 + CL = CA ..... (2)

$\therefore$ Substituted to in No. 1

$$CR = \frac{CA}{CL}$$

$$2.5 = \frac{50,000 + CL}{CL}$$

$$2.5\ CL = 50,000 + CL$$

$$2.5\ CL - CL = 50,000$$

$$1.5\ CL = 50,000$$

$$\therefore \quad CL = \frac{50,000}{1.5}$$

$\therefore$ Current Liabilities = 33,333

$\therefore$ CA = 50,000 + CL

= 50,000 + 33,333

$\therefore$ CA = 83,333.

11. From the following Balance Sheet Calcualte

(a) Current Ratio (b) Quick Ratio (c) Absolute Quick Ratio

(d) Debt Equity Ratio (e) Proprietory Ratio (f) Solvency Ratio

(g) Fixed Assets to Net worth Ratio (h) Fixed Assets Ratio

(i) Capital Gearing Ratio (j) Ratio of Inventory to working capital

(k) Ratio of current assets to fixed assets.

Liabilities	*Amount*	*Assets*	*Amount*
Equity Share Capital	10,00,000	Goodwill	5,00,000
6% Preference Share Capital	5,00,000	Plant & Machinery	6,00,000
General Reserve	1,00,000	Land & Building	7,00,000
Profit & Loss A/c	4,00,000	Furniture	1,00,000
12% Debentures	5,00,000	Stock in trade (Inventory)	6,00,000
Creditors	80,000	Bills Receivables	30,000
Bank over draft	20,000	Debtors	1,50,000
Bills Payable	1,24,000	Bank Balance	2,00,000
Provision for Taxation	1,76,000	Markatable Securities	20,000
	29,00,000		29,00,000

Ans :

Current Ratio :

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Current Assets = Stock in trade + Bills Receivable + Debtors + Bank Balance + Markatable securities

= 6,00,000 + 30,000 + 1,50,000 + 2,00,000 + 20,000

= 10,00,000

Current Liabilities :

= 80,000 + 20,000 + 1,24,000 + 1,76,000 = 4,00,000

$$\therefore \quad \text{Current Ratio} = \frac{10,00,000}{4,00,000}$$

= 2.5 ; 1

Quick Ratio :

$$\frac{\text{Quick Ratio}}{\text{Quick Liabilities}}$$

Quick Assets = Current Assets – Stock (Inventory)

10,00,000 – 6,00,000

Quick Assets = 4,00,000

Quick Liabilities = Current liabilities – Bank over draft

= 4,00,000 – 20,000

= 3,80,000

$$\therefore \quad \text{Quick Ratio} = \frac{6,00,000}{3,80,000}$$

$\therefore$ Quick Ratio = 1.58 ; 1

Absolute Quick Ratio :

$$\frac{\text{Absolute Quick Assets}}{\text{Current Liabilities}}$$

Absolute Quick Assets = Bank Balance + Marktable Securities

= 2,00,000 + 20,000

= 2,20,000

$$\therefore \quad \text{Absolute Quick Ratio} = \frac{2,20,000}{4,00,000}$$

= 0.55 ; 1

Debt Equity Ratio :

$$\frac{\text{Long term debts}}{\text{Share holders fund}}$$

Long term debts = 5,00,000

Share holders fund = Equity share capital + Preference share capital + Reserves + P & L A/c – Ficticious Assets

= 10,00,000 + 5,00,000 + 1,00,000 + 4,00,000

= 20,00,000

$$\therefore \quad \text{Debt / Equity Ratio} = \frac{5,00,000}{20,00,000}$$

= 0.25 ; 1

Proprietory Ratio :

$$\frac{\text{Share holders fund}}{\text{Total assets}}$$

$$= \frac{20,00,000}{29,00,000}$$

= 0.70 ; 1

Solvency Ratio :

$$\frac{\text{Debt due to out siders}}{\text{Total assets}}$$

Long term debts + Current liabilities

= 5,00,000 + 4,00,000

= 9,00,000

$\therefore$ Solvency Ratio = $\frac{9,00,000}{29,00,000}$

$\therefore$ Solvency Ratio = 0.31 ; 1

Fixed Assets to Networth :

$$\frac{\text{Fixed assets}}{\text{Share holders funds}}$$

Fixed Assets = Goodwill + Plant & Machinery + Land & Building + Furniture

= 5,00,000 + 6,00,000 + 7,00,000 + 1,00,000

= 19,00,000

$\therefore$ Fixed Assets to Networth = $\frac{19,00,000}{20,00,000}$

= 0.95 ; 1

Fixed Assets Ratio :

$$\frac{\text{Fixed Assets}}{\text{Capital Employed}}$$

Capital Employed = Equity share capital + Preference share capital + Reserves + P & L (Cr) + Debentures – Ficticious

= 10,00,000 + 5,00,000 + 1,00,000 + 4,00,000 + 5,00,000

= 25,00,000

$\therefore$ Fixed Assets Ratio = $\frac{19,00,000}{25,00,000}$

$\therefore$ Fixed Assets Ratio = 0.76 ; 1

Capital Gearing Ratio :

$$\frac{\text{Fixed Interest Securities}}{\text{Equity Share holders fund}}$$

Fixed Interest Securities = Preference share capiral + Debentures

= 5,00,000 + 5,00,000

= 10,00,000

Equity share holders fund = Equity share capital + Reserves + P & L A/c (Cr) Balance

= 10,00,000 + 1,00,000 + 4,00,000

= 15,00,000

Capital Gearing Ratio = $\frac{10,00,000}{15,00,000}$

= 0.67 ; 1

Ratio of Inventory to Working Capital :

$$\frac{\text{Inventory}}{\text{Working Capital}}$$

Working Capital = Current Assets – Current Liabilities

= 10,00,000 – 4,00,000

= 6,00,000

$\frac{6,00,000}{6,00,000}$ = 1

$\therefore$ 1 : 1

Ratio of Current Assets to Fixed Assets :

$$\frac{\text{Current Assets}}{\text{Fixed Assets}}$$

= $\frac{10,00,000}{19,00,000}$

= 0.53 ; 1

12. The following is the Balance Sheet of A Ltd. as on 31-12-1990.

Liabilities	*Amount*	*Assets*	*Amount*
Share capital		Land & Building	1,25,000
(20,00 shares of Rs. 10/-		Plant & Furnitures	75,000
each Rs. 5/- paid up)	1,00,000	Stock	50,000
Reserves & Surplus	65,000	Debtors	10,000
5% Debentures	1,00,000	Bills Receivables	5,000
Creditors	18,000	Cash at Bank	20,000
Bills Payable	7,000	Preliminary Expenses	5,000
	2,90,000		2,90,000

Sales for the year Rs. 6,00,000

Re arrange the above balance sheet in a form suitables for analysis and calculate the following ratios and offer your comments.

(1) Debt / Equity Ratios (2) Proprietory Rtaio (3) Current Ratio

(4) Acid Test Ratio (Quick Ratio) (5) Stock turnover ratio

(6) Average collection period.

Ans :

Debt / Equity Ratio :

$$\frac{\text{Long term debt}}{\text{Share holders fund}}$$

Long term debt = Debentures + Other long term liabilities

= 1,00,000 + 0

= 1,00,000

Share holders fund = Equity share capital + Reserves & Surplus

+ P & L A/c + Preference share capital – Ficticious assets

= 1,00,000 + 65,000 – 5,000

= 1,65,000 – 5,000 = 1,60,000

$\therefore$ Debt / Equity Ratio = $\frac{1,00,000}{1,60,000}$ = 0.625 ; 1

Proprietory Ratio :

$$\frac{\text{Share holders fund}}{\text{Total assets}}$$

$= \frac{1,60,000}{2,85,000}$

= 0.56 ; 1

Total Assets = Total Assets – Ficticious Assets

= 2,90,000 – 5,000

= 2,85,000

Current Ratio :

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Current Assets = Stock + Debtors + Bills Receivable + Cash

= 50,000 + 10,000 + 5,000 + 20,000

= 85,000

Current Liabilities = Creditors + Bills Payable

= 18,000 + 7,000

= 25,000

$\therefore$ Current Ratio = $\frac{85,000}{25,000}$

Current Ratio = 3.4 ; 1

Quick Ratio :

$$\frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

Quick Assets = Current Assets – Stock

= 85,000 – 50,000

= 35,000

$$\therefore \quad \text{Quick Ratio} = \frac{35,000}{25,000}$$

$$= 1.4 ; 1$$

Stock Turnover Ratio

$$\frac{\text{Net sales}}{\text{Closing stock}}$$

$$= \frac{6,00,000}{50,000}$$

Stock turnover ratio = 12 times.

Average Collection Period

$$\frac{\text{Average closing debtors}}{\text{Net sales}}$$

$$\text{Inday} = \frac{15,000}{6,00,000} \times 365$$

$$= 9.125 \text{ days.}$$

Note :

Average Debtors = Sundry Debtors + Bills Receivable

13. The following information is obtained from the books of Ever Green Co. Ltd. for the years ended 31st december 1991 and 1992.

Balance Sheet

Liabilities	1991	1992	Assets	1991	1992
Creditors	20,000	16,000	Cash at Bank	15,380	26,020
Bills payable	12,750	6,500	Trade Debtors	11,260	11,710
Debentures	1,00,000	1,00,000	Stock	56,160	49,460
Reserves	67,250	84,500	Fixed Assets	2,17,200	2,19,810
Capital	1,00,000	1,00,000			
	3,00,000	3,00,000		3,00,000	3,00,000

	1991	1992
Sales	*1,80,000*	*1,95,000*
Net Profit	*16,000*	*17,250*
Gross Profit	*40,000*	*60,000*

You are required to arrange to above balance sheet figures in form suitable for analysis and show separately the following ratios.

(1) Gross profit ratio (2) Operating ratio (3) Proprietory ratio

(4) Current Ratio (5) Debtors turnover ratio (6) Stock turnover ratio.

Ans :

Calculation of Gross Profit Ratios

$$\frac{\text{Gross profit}}{\text{Net sales}} \times 100$$

$$1991 = \frac{40,000}{1,80,000} \times 100$$

$$= 22.22\%$$

$$1992 = \frac{60,000}{1,95,000} \times 100$$

$$= 30.77\%$$

Calculation of Operating Ratio :

$$\frac{\text{Cost of goods sold} + \text{Operating expenses}}{\text{Net sales}} \times 100$$

Cost of Goods Sold = Sales – Gross Profit

1991 = 1,80,000 – 40,000 = 1,40,000

1992 = 1,95,000 – 60,000 = 1,35,000

Operating Expenses = Gross Profit – Net Profit

1991 = 40,000 – 16,000 = 24,000

1992 = 60,000 – 17,250 = 42,750

Operating Ratio :

$$1991 = \frac{1,40,000 + 24,000}{1,80,000}$$

$$= \frac{1,64,000}{1,80,000}$$

$$= 91.11\%$$

$$1992 = \frac{1,35,000 + 42,750}{1,95,000}$$

$$= \frac{1,77,750}{1,95,000}$$

$$= 91.15\%$$

Proprietory Ratio

$$\frac{\text{Share holders fund}}{\text{Total assets}}$$

(1991) Share holders fund = Capital + Reserves

1,00,000 + 67,250 = 1,67,250

(1992) 1,00,000 + 84,500 = 1,84,500

$$\therefore \quad \text{Proprietory Ratio } 1991 = \frac{1,67,250}{3,00,000}$$

$$= 0.56 ; 1$$

$$= \frac{1,84,500}{3,07,000}$$

$$= 0.60 ; 1$$

Calculation of Current Ratio

$$\frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Current Assets = Cash at Bank + Trade Debtors + Stock

1991 = 15,380 + 11,260 + 56,160 = 82,800

1992 = 26,020 + 11,710 + 49,460 = 87,190

Current Liabilities = Creditors + Bills Payable

1991 = 20,000 + 12,750 = 32,750

1992 = 16,000 + 6,500 = 22,500

$\therefore$ Current Ratio = 1991

$$= \frac{82,800}{32,750}$$

$$= 2.53 ; 1$$

Current Ratio = 1992

$$= \frac{87,190}{22,500}$$

$$= 3.88 ; 1$$

Calculation of Debtors Turnover Ratio

$$\text{Debtors Turnover Ratio} = \frac{\text{Net Sales}}{\text{Closing Trade Debtors}}$$

$$1991 = \frac{1,80,000}{11,260}$$

$$= 15.99 \text{ times.}$$

$$1992 = \frac{1,95,000}{11,710}$$

$$= 16.65 \text{ times}$$

Calculation of Stock Turnover Ratio

$$\frac{\text{Cost of Goods Sold}}{\text{Averge Stock}}$$

$$\text{Average Stock} = \frac{56,160 + 49,460}{2}$$

$$= \frac{1,05,620}{2} = 52,810$$

$$1991 = \frac{1,40,000}{56,160} = 2.49 ; 1$$

$$1992 = \frac{1,35,000}{52,810} = 2.56 ; 1$$

14. Following is the Balance Sheet of C Limited as on 31st December, 2000

Liabilities	*Amount*	*Assets*	*Amount*
Equity Sh. Capital	20,000	Goodwill	12,000
Capital Reserve	4,000	Fixed Assets	28,000
8% Loan on mortgage	16,000	Stocks	6,000
Trade Creditors	8,000	Debtors	6,000
Bank overdraft	2,000	Investments	2,000
Taxation : Current	2,000	Bank	6,000
Taxation : Future	2,000		
Profit and Loss A/c			
Profit 2000 after taxation and interest on fixed deposits			
Less : Tr. to Reserve (4,000)			
Less : Dividend (4,000)	6,000		
	60,000		60,000

Ans :

Liquidity Ratio :

(i) Current Ratio

(ii) Liquid Ratio

(i) $\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$

CA = Stock + Debtors + Bank

= 6,000 + 6,000 + 6,000

= 18,000

CL = Trade Creditors + Bank Overdraft Taxation (Current)

= 8,000 + 2,000 + 2,000

= 12,000

$\therefore$ Current Ratio $= \frac{18,000}{12,000} = 1.5$

(ii) $\text{Liquid Ratio} = \frac{\text{Liquid Assets}}{\text{Current Liabilities}}$

Liquid Assets = Current Assets – Stocks

= 18,000 – 6,000

= 12,000

$\therefore$ Liquid Ratio $= \frac{12,000}{12,000} = 1$

2. Net working Capital = Current Assets – Current Liabilities

= 18,000 – 12,000

= 6,000

3. $\text{Debt Equity Ratio} = \frac{\text{Long term debts}}{\text{Shareholders funds}}$

Share holders funds = Equity share capital + Capital reserve

= 20,000 + (4,000 + 6,000)

= 30,000

$\therefore$ Debt equity ratio $= \frac{16,000}{30,000} = 0.53$

4. $\text{Proprietary Ratio} = \frac{\text{Total Assets}}{\text{Proprietary funds or Share holder's funds}}$

$= \frac{60,000}{30,000}$

= 2.

15. From the following particulars, prepare the balance sheet of ABC limited, which has only one class of capital :

Sales for the year : Rs. 20,00,000

Gross profit ratio : 25 percent

Current assets ratio : 1.50

Quick assets (cash and debtors) ratio : 1.25

Stock turnover ratio : 15

Debts collection period : ***1 $\frac{1}{2}$ months***

Turnover to fixed assets : ***1.5***

Ratio of reserves to share capital : ***0.33 (i.e., $\frac{1}{3}$)***

Fixed assets to net worth : ***0.83 (i.e., $\frac{5}{6}$).***

Ans :

Balance Sheet

Liabilities	*Rs.*	*Assets*	*Rs.*
Share Capital	9,00,000	Fixed Assets	10,00,000
Reserves	3,00,000	Current Assets	
Current Liabilities	4,00,000	Debtors	2,50,000
		Stock	1,00,000
		Cash	2,50,000
	16,00,000		16,00,000

Working Notes :

1. Gross profit ratio = 25% Gross profit ratio = $\frac{\text{Gross profit}}{\text{Sales}} \times 100$

Sales = Rs. 20,00,000

$25 = \frac{\text{Gross profit}}{20,00,000} \times 100$

$25 \times 20,00,000$ = Gross profit 100

5,00,00,000 = 100 Gross profit

Gross Profit = $\frac{5,00,00,000}{100}$

Gross Profit = 5,00,000

Cost of goods sold = Sales – Gross Profit

= 20,00,000 – 5,00,000

= Rs. 15,00,000

2. Stocks Turnover Ratio = 15

Cost of goods sold / Closing stock = 15

15,00,000 / Closing stock = 15

By cross multiplying, we get

$15 \times$ Closing stock = 15,00,000

$\therefore$ Closing stock = $\frac{15,00,000}{15}$

= Rs. 1,00,000

3. Current Asset Ratio – Quick Asset Ratio = Stock

1.50 – 1.25 = 0.25

If 0.25 = 1,00,000

1.50 = ?

= Rs. 6,00,000 = Current Assets

1.5 = $\frac{6,00,000}{\text{Current Liabilities}}$

$\therefore$ Current Liabilities = $\frac{6,00,000}{1.5}$ = Rs. 4,00,000

4. Turnover to Fixed Assets = 1.5

i.e., Cost of goods sold / Fixed assets = 15.

15,00,000 / Fixed Assets = 1.5

$\therefore$ Fixed Assets = $\frac{15,00,000}{1.5}$ = Rs. 10,00,000

5. Fixed Assets to Net worth = 0.83 (i.e., $\frac{5}{6}$)

Fixed Assets / Net worth = $\frac{5}{6}$

10,00,000 / Net worth = $\frac{5}{6}$

$\therefore$ Net worth = $\frac{10,00,000}{5/6}$

= $\frac{10,00,000}{5} \times 6$

= Rs. 12,00,000

6. Reserves to Share Capital = 0.33 (i.e., $\frac{1}{3}$)

Reserves / Share Capital = $\frac{1}{3}$

Reserves = $\frac{1}{3}$ share capital

Reserves = Net worth – Share capital

$\Rightarrow$ $\frac{1}{3}$ Share capital = Net worth – Share capital

$\frac{1}{3}$ Share capital + Share capital = Net worth

$\frac{1}{3}$ Share capital + Share capital = 12,00,000

Share capital ($\frac{1}{3}$ + 1) = 12,00,000

Share capital ($\frac{4}{3}$) = 12,00,000

$\therefore$ Share capital = $\frac{12,00,000}{4/3}$

= $\frac{12,00,000}{4} \times 3$

= Rs. 9,00,000

$\therefore$ Reserves = 12,00,000 – 9,00,000

= Rs. 3,00,000

7. Debtors Turnover Ratio

Debts collection period = 1 $\frac{1}{2}$ month

Debtors turnvoer ratio = $\frac{12}{1.5}$ = 8

Debtors turnover ratio = Sales / Average Debtors

8 = 2,00,000 / Average Debtors

$\therefore$ Average Debtors = $\frac{20,00,000}{8}$

= Rs. 2,50,000

Current Assets = Stocks + Debtors + Cash

6,00,000 = 1,00,000 + 2,50,000 + Cash

6,00,000 = 3,50,000 + Cash

$\therefore$ Cash = 6,00,000 – 3,50,000

= Rs. 2,50,000

16. From the following information, you are required to prepare a balance sheet.

Current ratio 1.75

Liquid ratio 1.25

Stock turnover ratio (COGS / Closing stock) 9

Gross profit ratio 25%

Debt collection period 1 $\frac{1}{2}$ months

Reserves and surplus to capital 0.2

Turnover to fixed assets 1.2

Capital gearing ratio 0.6

Fixed assets to net worth 1.25

Sales for the year Rs. 12,00,000.

Ans :

Balance Sheet

Liabilities	*Rs.*	*Assets*	*Rs.*
Capital	5,00,000	Fixed Assets	7,50,000
Reserve & Surplus	1,00,000	Current Assets :	
Long term funds	3,00,000	Stocks	1,00,000
Current Liabilities	2,00,000	Debtors	1,50,000
		Cash and other Balance	1,00,000
	11,00,000		11,00,000

Working Notes :

1. Gross profitr ratio = 25%

Sales = Rs. 12,00,000

$\therefore$ Gross profit = 12,00,000 $\times$ 25%

= Rs. 3,00,000

Cost of goods sold = Sales – Gross profit

= 12,00,000 – 3,00,000

= Rs. 9,00,000

2. Stock turnover ratio = 9

Cost of goods sold / Closing stock = 9

9,00,000 / Closing stock = 9

Closing stock $\times$ 9 = 9,00,000

$\therefore$ Closing stock = 9,00,000 / 9

= 1,00,000

3. Current ratio – Liquid ratio = Stock

1.75 – 1.25 = 0.5

0.5 = 1,00,000

1.75 = ?

Current Assets = Rs. 3,50,000

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$1.75 = \frac{3,50,000}{\text{Current Liabilities}}$$

$$\therefore \text{ Current Liabilities} = \frac{3,50,000}{1.75} = \text{Rs. } 2,00,000$$

4. Turnover to fixed assets = 1.2

i.e., cost of goods sold / fixed assets = 1.2

9,00,000 / Fixed Assets = 1.2

Fixed Assets $\times$ 1.2 = 9,00,000

$\therefore$ Fixed Assets = 9,00,000 / 1.2

= Rs. 7,50,000

5. Fixed Assets to Networth = 1.25

Fixed Assets / Networth = 1.25

7,50,000 / Networth = 1.25

$\therefore$ Networth = 7,50,000 / 1.25

= Rs. 6,00,000

6. Reserve and Surplus to Capital = 0.2

Reserve and Surplus / Capital = 0.2

Reserve and Surplus = Capital $\times$ 0.2

Reserve and Surplus = Networth – Capital

$\Rightarrow$ Capital $\times$ 0.2 = Networth – Capital

0.2 $\times$ Capital + Capital = Networh

0.2 $\times$ Capital + Capital = 6,00,000

Capital (0.2 + 1) = 6,00,000

Capital $\times$ 1.2 = 6,00,000

$\therefore$ Capital = 6,00,000 / 1.2

= Rs. 5,00,000

$\therefore$ Reserves and Surplus = Networth – Capital

= 6,00,000 – 5,00,000

= Rs. 1,00,000

7. Capital gearing ratio = 0.6

Long term funds / capital = 0.6

Long term funds / 5,00,000 = 0.6

$\therefore$ Long term funds = 5,00,000 $\times$ 0.6

= Rs. 3,00,000

8. Debtors turnover ratio

Debtors collection period = $1\frac{1}{2}$ months

$$\text{Debtors turnover ratio} = \frac{12}{1.5}$$

= 8

Debtors turnover ratio = Sales / Average Debtors

8 = 12,00,000 / Average Debtors

Average Debtors × 8 = 12,00,000

∴ Average Debtors = 12,00,000 / 8

= Rs. 1,50,000

Current Assets = Stocks + Debtors + Cash and Other Balance

3,50,000 = 1,00,000 + 1,50,000 + Cash and Other Balance

3,50,000 = 2,50,000 + Cash and Other Balance

∴ Cash and Other Balance = 3,50,000 – 2,50,000

= Rs. 1,00,000.

17. Find the average stock, opening stock, closing stock, purchases working capital turnover ratio and average collection period. Stock turnover ratio is 6 times, gross profit ratio is 20% on sales, sales are Rs. 3 lacs, closing stock is Rs. 10,000 more than opening stock, sundry debtors is Rs. 60,000 net working capital is Rs. 50,000.

Ans :

Given

Stock turnover ratio = 6 times

Gross profit ratio – 20% on sales

Sales – Rs. 3,00,000

Closing stock – Rs. 10,000 + opening stock

Sundry debtors – Rs. 60,000

Net working capital – Rs. 50,000

Required to find :

Average stock ?

Opening stock ?

Closing stock ?

Purchases ?

Working capital turnover ratio ?

Average collection period ?

1. Stock Turnover Ratio = $\frac{\text{Cost of goods sold}}{\text{Average stock}}$ = 6

$= \frac{3,00,000}{\text{Average stock}}$ = 6

Average stock = $\frac{3,00,000}{6}$ = 50,000

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

$= \frac{\text{Opening stock} + \text{Opening stock} + 10,000}{2}$ = 50,000

$= \frac{2 \text{ opening stock} + 10,000}{2}$ = 50,000

= 2 opening stock + 10,000 = 1,00,000

= 2 opening stock = $\frac{90,000}{2}$

= opening stock = $\frac{90,000}{2}$

2. Opening stock = Rs. 45,000
3. Closing stock = Opening stock + Rs. 10,000

= Rs. 45,000 + Rs. 10,000

= Rs. 55,000

4. Purchases = Sales + Closing stock – Opening stock

= 3,00,000 + 55,000 – 45,000

= 3,10,000

5. Working capital turnover ratio = $\frac{\text{Net sales}}{\text{Working capital}}$

$= \frac{3,00,000}{50,000}$ = 6

6. Average collection period = $\frac{12 \text{ months}}{\text{Debtors turnover ratio}}$

$\Rightarrow$ Debtors turnvoer ratio = $\frac{\text{Credit sales}}{\text{Trade debtors}}$

$\Rightarrow$ Credit sales = Sales – Debtors

$\therefore$ Debtors turnover ratio = $\frac{3,00,000 - 60,000}{60,000}$

$= \frac{2,40,000}{60,000} = 4$

$\therefore$ Average collection period = $\frac{12 \text{ months}}{4}$

= 3 months

18. Following is the summarized financial statements of XYZ Ltd. as on 31st March 2003 :

Liabilities	*Amount*	*Assets*	*Amount*
Paid-up Capital	15,00,000	Fixed Assets	16,50,000
Reserves & Surplus	6,00,000	Stock in Trade	9,10,000
Debentures (Long-term)	5,00,000	Bad Debts	12,40,000
Bank Overdraft	2,00,000	Investments (Short term)	1,60,000
Sundry Creditors	12,00,000	Cash	40,000
	40,00,000		40,00,000

Annual Sales Rs. 74,40,000

Gross profit Rs. 7,44,000

Bank overdraft is payable on demand

You are required to calculate the following ratios for the year and comment on the financial position as revealed by these ratios :

(a) Debt Equity Ratio

(b) Current Ratio

(c) G.P. Ratio

(d) Debtors Turnover Ratio

(e) Stock Turnover Ratio

Ans :

Calculation of Ratios :

(i) Debt Equity Ratio :

DER = $\frac{\text{Long term Debts}}{\text{Share holders funds}}$

= $\frac{\text{Debentures}}{\text{Capital}} = \frac{5,00,000}{15,00,000}$

= 0.333

Since the ratio is 0.33 : 1, which describe as there is use of more equity than debt in the business :

(ii) Current Ratio

CR = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

= $\frac{\text{Stock in Trade} + \text{Debts} + \text{Investments} + \text{Cash}}{\text{Bank overdraft} + \text{Sundry creditors}}$

= $\frac{9,10,000 + 12,40,000 + 1,60,000 + 40,000}{2,00,000 + 12,00,000}$

= $\frac{23,50,000}{14,00,000} = 1.678$

As, the ratio is 1.678 : 1, there is greater margin of safety for creditors.

(iii) G.P. Rtaio :

G.P. Ratio = $\frac{\text{Gross Profit}}{\text{Sales}} \times 100$

= $\frac{7,44,000}{74,40,000} \times 100 = 10\%$

As the gross profit ratios for the last year is not given, it is difficult to say the financial position compared to previous year. But, present year's G.P. is 10% which is average percentage in most business.

(iv) Debtors Turnover Ratio :

DTOR = $\frac{\text{Net credit sales}}{\text{Trade debtors}}$

As credit sales are not given, assume that total sales are on credit.

$$= \frac{74,40,000}{12,40,000}$$

$$= 6$$

As the DTR is 6, which is low, this shows that the collection period is long and hence there will be delayed payments by debtors.

(v) Stock Turnover Ratio :

$$\text{STOR} = \frac{\text{Cost of goods sold}}{\text{Avg. Inventory}} = \frac{\text{Sales}}{\text{Closing Stock}}$$

$$= \frac{74,40,000}{9,10,000}$$

$$= 8.175$$

As the ratio is 8.175, which is normal therefore there is good sales procedure followed.

19. From the following information, calculate sales, sundry debtors, closing stock and sundry creditors. Debtors turnover ratio is 4 ; Stock turnover ratio is 1.5 ; Creditors turnover ratio is 6 ; gross profit ratio is 25% ; The gross profit for the year ended March 2003 is Rs. 4 lacs. Closing stock s Rs. 10,000 more than opening stock. Bills receivables are Rs. 25,000 and bills payable are Rs. 10,000.

Ans :

(i) $\text{Debtors turnover ratio} = \frac{\text{Net credit sales}}{\text{Average trade debtors}}$

Debtors turnover ratio = 4

(ii) $\text{Sales turnover ratio} = \frac{\text{Cost of goods sold}}{\text{Average inventory}} = 1.5$

(iii) $\text{Creditors turnover} = \frac{\text{Net credit purchases}}{\text{Average trade creditors}} = 6$

(iv) Gross profit = 25% on sales

Gross Profit = 4,00,000

$$\Rightarrow \text{Sales} = \frac{4,00,000}{0.25} = 16,00,000$$

(v) Closing stock is 10,000 more than opening stock

Calculation of Sundry Debtors :

$$\text{Debtors turnover} = \frac{\text{Credit sales}}{\text{Average trade debtors}} = 4$$

$$\Rightarrow \frac{16,00,000}{4}$$

$$\Rightarrow \text{Trade debtors} = 4,00,000$$

Calculation of Closing Stock :

$$\text{Stock turnover ratio} = \frac{\text{Cost of goods sold}}{\text{Average stock}} = 1.5$$

Cost of goods sold = Sales – G.P

= 16,00,000 – 4,00,000

= 8,00,000

$$\frac{12,00,000}{\text{Closing stock}} = 1.5$$

$$\text{Closing stock} = \frac{12,00,000}{1.5} = 8,00,000$$

$$\therefore \text{Opening stock} = 7,90,000$$

Calculations Creditors Value :

$$\text{Creditors turnover ratio} = \frac{\text{Credit purchases}}{\text{Average creditors}}$$

Purchases = Sales + Closing stock + Opening Stock – Gross Profit

= 16,00,000 + 8,00,000 – 7,90,000 – 4,00,000

= 12,10,000

$$\frac{12,10,000}{\text{Average Creditors}} = \text{Average creditors} = \frac{12,10,000}{6} = 2,01,666$$

20. With the help of the following information, draw the balance sheet of a company :

Current ratio	***2.5***
Liquidity ratio	***1.5***

Net working capital	***Rs. 3,00,000***
Stock turnover ratio	***6 times***
(cost of sales / closing stock)	
Gross profit ratio	***20%***
Fixed assets turnover ratio	***2 times***
(on cost of sales)	
Debtors collection period	***2 months***
Fixed assets to share holder's net worth	***0.80***
Reserve and surplus to capital	***0.50***

Ans :

Current ratio = 2.5

Working capital = 3,00,000

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

Working capital = Current assets – Current liabilities

2.5 – 1 = 1.5

If 1.5 = 3,00,000

2.5 = ?

$$= \frac{3,00,000 \times 2.5}{1.5} = 5,00,000$$

Current assets = 5,00,000

Current liabilities = 2,00,000

Liquid ratio = 1.5

Current ratio – Liquid ratio = Stock

2.5 – 1.5 = 1

If 2.5 = 5,000

1 = ?

$$= \frac{1 \times 5,00,000}{2.5} = 20,000$$

Stock turnover ratio = 6

$$\frac{\text{Cost of goods sold}}{\text{Average stock}} \text{ or } \frac{\text{Sales}}{\text{Closing stock}} = 6$$

$$\frac{\text{Cost of goods sold}}{2,00,000} = 6$$

Cost of goods sold = 2,00,000 × 6 = 12,00,000

Sales = Cost of goods sold + Gross profit

Sales = 12,00,000 + 25% on 12,00,000

= 15,00,000

$$\text{Debtors collection period} = \frac{12}{\text{Debtors turnover}}$$

$$\text{Debtors turnover ratio} = \frac{12}{2} = 6 = \frac{\text{Sales}}{\text{Closing debtors}} = 6$$

$$\text{Closing debtors} = \frac{1,50,000}{6} = 2,50,000$$

Fixed asset turnover ratio = 2

$$\frac{\text{Cost of goods sold}}{\text{Fixed assets}} = 2$$

$$\frac{12,00,000}{\text{Fixed assets}} = 2$$

Fixed assets = 6,00,000

Fixed assets to share holders network = 0.8

$$\frac{\text{Fixed assets}}{\text{Share holder's networth}} = 0.8$$

$$\frac{6,00,000}{0.8} = \text{Share holder's networth}$$

Share holders networth = 7,50,000

$$\frac{\text{Reserves \& Surplus}}{\text{Capital}} = 0.50$$

Reserves and Surplus = 0.50 × capital

Reserves and Surplus = Share holder's networth – Capital

$\Rightarrow$ 0.5 × Capital = Share holder networth – Capital

1.5 Capital = 7,50,000

$$\text{Capital} = \frac{7,50,000}{1.5} = 5,00,000$$

$\therefore$ Reserves and Surplus = 2,50,000

Balance Sheet

Share capital	5,00,000	Fixed assets		6,00,000
Reserves and surplus	2,50,000	Current Assets		
		Inventory	2,00,000	
Long term liabilities (balancing figure)	1,50,000	Debtors	2,50,000	
Current liabilities	2,00,000	Cash	50,000	5,00,000
	11,00,000			11,00,000

SHORT NOTES

1. Financial Ratio

Financial ratios are one of the most common tools of managerial decision making. A ratio is a comparison of one number to another—mathematically, a simple division problem. Financial ratios involve the comparison of various figures from the financial statements in order to gain information about a company's performance. It is the interpretation, rather than the calculation, that makes financial ratios a useful tool for business manager. Ratios may serve as indicators, clues, or red flags regarding noteworthy relationships between variables used to measure the firm's performance in terms of profitability, asset utilization, liquidity, leverage, or market valuation.

2. Liquidity Ratio

It refers to the ability of the firm to meet its current liabilities. The liquidity ratio, therefore, are also called 'Short-term Solvency Ratio'. These ratio are used to assess the short-term financial position of the concern. They indicate the firm's ability to meet its current obligation out of current resources.

3. Interest Coverage Ratio

This ratio is also termed as 'Debt Service Ratio'. This ratio is calculated as follows:

Formula :

Interest Coverage Ratio = Net Profit before charging interest and tax / Fixed Interest Charges

4. Stock Turnover Ratio

This ratio indicates the relationship between the cost of goods during the year and average stock kept during that year.

Formula:

Stock Turnover Ratio = Cost of Goods Sold / Average Stock

Here, Cost of goods sold = Net Sales – Gross Profit

Average Stock = Opening Stock + Closing Stock/2

5. Working Capital Turnover Ratio

This ratio reveals how efficiently working capital has been utilized in making sales.

Formula :-

Working Capital Turnover Ratio = Cost of Goods Sold / Working Capital

Here, Cost of Goods Sold = Opening Stock + Purchases + Carriage + Wages + Other Direct Expenses - Closing Stock

Working Capital = Current Assets – Current Liabilities

6. Gross Profit Ratio

This ratio shows the relationship between gross profit and sales.

Formula :

Gross Profit Ratio = Gross Profit / Net Sales *100

Here, Net Sales = Sales – Sales Return

7. Net Profit Ratio

This ratio shows the relationship between net profit and sales. It may be calculated by two methods:

Formula:

Net Profit Ratio = Net Profit / Net sales *100

Operating Net Profit = Operating Net Profit / Net Sales *100

Here, Operating Net Profit = Gross Profit – Operating Expenses such as Office and Administrative Expenses, Selling and Distribution Expenses, Discount, Bad Debts, Interest on short-term debts etc.

UNIT IV

MARGINAL COSTING

i. Definition of Marginal Costing & Absorption Costing. Differences between Marginal Costing & Absorption Costing, Income determination under marginal & absorption costing.

ii. Marginal cost equation. CVP Analysis, P/V Ratio, Break-even point & Margin of safety

iii. B-E charts: Graphic method of B.E Analysis, Merits and disadvantages of B.E charts

iv. Advantages & Limitations of Marginal costing

4.1 MARGINAL COSTING

Marginal costing is very helpful in managerial decision making. Management's production and cost and sales decisions may be easily affected from marginal costing. That is the reason, it is the part of cost control method of cost accounting. Before explaining the application of marginal costing in managerial decision making, we are providing little introduction to those who are new for understanding this important concept.

4.1.1 Definition of Marginal Costing

According to the Terminology of Cost Accountancy of the Institute of Cost and Management Accountants, London, Marginal Cost represents "the amount at any given volume of output by which aggregate costs are changed if the volume of output is increased by one unit". In practice, this is measured by the total variable costs attributable to one unit. In this context, a unit may be a single article, a batch of articles, an order, a stage of production capacity, a man-hour, a process or a department. It relates to the change in output in the particular circumstances under consideration.

In the words of Blocker and Weltmore, "Marginal Cost is the increase or decrease in total cost which results from producing or selling additional or fewer units of a product or from a change in the method of production or distribution such as the use of improved machinery, addition or exclusion of a product or territory, or selection of an additional sales channel."

Analysing the definitions given above, we find that with the increase in one unit of output, the total cost is increased and this increase in total cost from the existing to the new level is known as Marginal Cost.

For example, the cost of production of 1,000 units of radios is Rs. 2,00,000 and that of 1001 units is Rs. 2,00,150 the marginal cost is Rs. 150, i.e., 2,00,150 – Rs. 2,00,000.

Marginal cost may also be defined as "the aggregate of variable costs" or "prime cost plus variable overheads". Thus, if for the production of 1,000 units of a product the manufacturer has to incur Rs. 75,000 for materials, Rs. 50,000 for direct wages, Rs. 25,000 for variable overheads and Rs. 50,000 fixed overheads, the marginal cost can be ascertained as follows :

	Total Rs.	Per unit (1,000 units) Rs.
Direct materials	75,000	75
Direct Wages	50,000	50
Prime Cost	1,25,000	125
Variable Overheads	25,000	25
Marginal Cost	1,50,000	150

4.1.2 Need for Marginal Costing

Marginal costing is required for following reasons :

- Variable cost per unit remains constant; any increase or decrease in production changes the total cost of output.
- Total fixed cost remains unchanged up to a certain level of production and does not vary with increase or decrease in production. It means the fixed cost remains constant in terms of total cost.
- Fixed expenses exclude from the total cost in marginal costing technique and provide us the same cost per unit up to a certain level of production.

4.1.3 Characteristics / Features of Marginal Costing

The main features of marginal costing are as follows:

1. Cost Classification

The marginal costing technique makes a sharp distinction between variable costs and fixed costs. It is the variable cost on the basis of which production and sales policies are designed by a firm following the marginal costing technique.

2. Stock/Inventory Valuation

Under marginal costing, inventory/stock for profit measurement is valued at marginal cost. It is in sharp contrast to the total unit cost under absorption costing method.

3. Marginal Contribution

Marginal costing technique makes use of marginal contribution for making various decisions. Marginal contribution is the difference between sales and marginal cost. It forms the basis for judging the profitability of different products or departments.

4.1.4 Assumptions of Marginal Costing

The technique of marginal costing is based upon the following assumptions :

1. All elements of cost—production, administration and selling and distribution—can be segregated into fixed and variable components.
2. Variable cost remains constant per unit of output irrespective of the level of output and thus fluctuates directly in proportion to changes in the volume of output.
3. The selling price per unit remains unchanged or constant at all levels of activity.
4. Fixed costs remain unchanged or constant for the entire volume of production.
5. The volume of production or output is the only factor which influences the costs.

4.2 Absorption Costing

Absorption costing also known as 'full costing' is the total cost technique. It is the conventional and most widely used technique of ascertaining cost. According to ICMA, London, defines absorption costing as "the practice of charging all costs both variable and fixed to operations, processes or products."

Under this technique, product cost is made up of all direct costs (i.e. direct material, direct labour, direct expenses and variable factory overheads) plus fixed factory overheads absorbed at a predetermined rate on the basis of normal capacity. The administration, selling and distribution overheads are treated as period costs, and hence, are written off against the income for the period in which they are incurred.

4.2.1 Features / Characteristics of Absorption Costing

The basic features of absorption costing are as follows :

1. All variable manufacturing costs and fixed factory overheads are treated as product costs and hence charged to products, processes or operations.
2. All administration, selling and distribution overheads are treated as period costs, and hence are written off against the profits of the period in which they are incurred.
3. As fixed factory overheads are included in unit cost, the value of closing inventory includes fixed factory/production overheads.
4. Under absorption costing, cost per unit remains same only if there is no change in the level of output. However, in case the level of output changes, the cost per unit also changes because of the presence of fixed costs.

4.2.2 Advantages of Absorption Costing

The following are the important advantages of absorption costing :

1. Absorption costing is a simple and most commonly used technique of ascertaining cost.

2. The technique of absorption costing ensures that all costs including fixed and variable related to production are charged to products, processes or operations.
3. It ensures correct fixation of selling prices in the long run as fixed costs are also considered for calculating per unit cost.
4. The ascertainment of income under absorption costing shows gross profit and net profit separately which helps in taking various decisions.
5. It discloses inefficient and efficient utilization of resources allocated to a particular cost centre by indicating under absorption and overabsorption of fixed production overheads.
6. It conforms to the principles of accrual and matching of costs with revenues of the relevant period.

4.2.3 Limitations of Absorption Costing

Absorption costing suffers from certain limitations, the most important are as follows :

1. As the cost per unit changes with the change in the level of output under absorption costing, comparison and control of costs becomes difficult.
2. In absorption costing, some of the current period's fixed costs are carried forward to the next period because of the valuation of closing stock based on cost per unit inclusive of fixed factory overheads.
3. It is not helpful in taking certain managerial decisions such as selection of a profitable product/sales mix; make or buy decisions, accept or reject decisions, additional orders or orders of export; problem of key or limiting factor, determination of the optimum level of activity, close or shut down decisions, etc.
4. The fixed manufacturing overheads may be absorbed on wrong or arbitrary basis causing under or over recovery of overheads.
5. It may not be possible to prepare flexible budgets under absorption costing.

4.3 Differences between Marginal Costing and Absorption Costing

Following are the various points of difference between absorption costing and marginal costing.

Absorption Costing	Marginal Costing
1. All costs fixed and variable are included for ascertaining the cost.	1. Only variable costs are included. Fixed costs are recovered from contribution.
2. Different unit costs are obtained at different levels of output because of fixed expenses remaining same.	2. Marginal cost per unit will remain same at different levels of output because variable expenses vary in the same proportion in which output varies.
3. Difference between sales and total cost is profit.	3. Difference between sales and marginal cost is contribution and difference between contribution and fixed cost is profit or loss.
4. A portion of fixed cost is carried forward to the next period because closing stock of work-in-progress and finished goods is valued at cost of production which is inclusive of fixed cost. In this way cost of a particular period cost should be charged to the period concerned and should not be carried over to the next period.	4. Stock of work-in-progress and finished goods are valued at marginal cost which does not include fixed cost. Fixed cost of a particular period is charged to that very period and is not carried over to the next period by including it in closing stock. Being so, costs of a particular period are not vitiated.
5. The apportionment of fixed expenses on an arbitrary basis gives rise to over or under absorption of overheads which ultimately makes the product cost inaccurate and unreliable.	5. Only variable costs are charged to products, marginal cost technique does not lead to over under absorption of fixed overheads.
6. Absorption costing is not very helpful in taking managerial decisions such as whether to accept the export order or not, whether to buy or manufacture, the minimum price to be charged during the depression etc.	6. The technique of marginal costing is very helpful in taking managerial decisions because it takes into consideration the additional cost involved only assuming fixed expenses remaining constant.
7. Costs are classified according to functional basis such as production cost, office and administrative cost and selling and distribution cost.	7. Costs are classified according to the behaviour of cost i.e., fixed costs and variable costs.
8. Absorption costing fails to establish relationship of cost, volume and profit as costs are seldom classified into fixed and variable.	8. Cost, Volume and Profit (i.e. CVP) relationship is an integral part of marginal cost studies as costs are classified into fixed and variable cost.

4.4 Income Determination under Marginal Costing

Under marginal costing only variable costs are charged to operations, processes or products. All fixed costs are written off against profits in the period in which they arise. The income under marginal costing is determined as below:

Income Statement Under Marginal Costing

	Particulars	`	`
A.	Sales		XXX
B.	Variable Cost of Sales :		
	Direct Material Cost	XXX	
	Direct Labour Cost	XXX	
	Direct Expenses	XXX	
	Variable Production/Manufacturing Overheads	XXX	
	Variable Cost of Goods Product	XXX	
Add :	Opening Stock	XXX	
		XXX	
Less :	Closing Stock	XXX	
		XXX	
Add :	Variable Administration Overheads	XXX	
		XXX	
Add :	Variable Selling and Distribution Overheads	XXX	XXX
	Variable Cost of Sales		XXX
C.	Contribution (A – B)		
D.	Fixed Overheads:		
	Fixed Factory / Production Overheads	XXX	
	Fixed Administration Overheads	XXX	
	Fixed Selling and Distribution Overheads	XXX	XXX
E.	Profit or Income Under Marginal Costing		XXX

PROBLEMS

Example 1

Following information relates to ABC Ltd.

Normal capacity	50,000 units
Units produced	60,000 units
Opening stock	2,000 units
Closing stock	7,000 units
Selling price per unit	Rs. 20
Variable cost per unit:	
Direct material	Rs. 5
Direct labour	Rs. 4
Variable factory overheads per unit	Rs. 3
Variable administration, selling and distribution overheads per unit sold	Rs. 2
Fixed Overheads:	
Manufacturing	Rs. 40,000
Administration	Rs. 30,000
Selling and distribution	Rs. 60,000

You are required to prepare income statement under marginal costing.

Solution :

Income Statement Under Absorption Costing

Particulars		Rs.	Rs.
A.	Sales (60,000 + 2,000 – 7,000 = 55,000 units @ Rs. 20 each)		11,00,000
B.	Variable Cost of Sales :		
	Direct material cost (60,000 × 5)	3,00,000	
	Direct labour cost (60,000 × 4)	2,40,000	
	Variable factory overheads (60,000 × 3)	1,80,000	
	Variable Cost of Goods Produced	7,20,000	
Add :	Opening Stock (2,000 × 12)	24,000	
		7,44,000	
Less :	Closing stock (7,000 × 12)	84,000	
	Variable Cost of Goods Sold (55,000 × 12)	6,60,000	
Add :	Variable administration, selling and distribution overheads (55,000 × 2)	1,10,000	7,70,000
	Variable cost of sales (55,000 × 14)		3,30,000
C.	Contribution (A – B)		

D.	Fixed Overheads:		
	Manufacturing	40,000	
	Administration	30,000	
	Selling and Distribution	60,000	1,30,000
	Total Fixed Overheads		
E.	Income or Profit Under Marginal costing		2,00,000

Example 2

Prepare Income statement under Marginal Costing from the information given below

		Rs.
Sales		24,00,000
Less : Cost of goods manufactured (Variable)		15.00.000
Gross Margin (Contribution)		9,00,000
Less : Operating Expenses		
Selling Expenses	3,00,000	
Administrative Expenses	1.50.000	4.50.000
Net Profit		4,50,000

The selling Expenses are 90% variable and the administrative expenses are 20% variable.

Solution :

Income Statement

		Rs.
Sales		24,00,000
Less: Variable Cost	15,00,000	
Cost Of Goods Manufactured		
Variable Selling Expenses (90% of 3,00,000)	2,70,000	
Variable Admin. Expenses(20% of 1,50,000)	30,000	
		18,00,000
Contribution		6,00,000
Less: Fixed Costs		
Fixed Selling Expenses(10% of 3,00,000)	30,000	
Fixed Admin. Expenses(80% of 1,50,000)	1,20,000	
		1,50,000
Net Profit		4,50,000

4.5 Income Determination under Absorption Costing

The income under absorption costing is determined as below :

Income Statement Under Absorption Costing

Particulars		`	`
A.	Sales		XXX
B.	Less : Cost of Goods Sold:		
	Direct Material	XXX	
	Direct Labour	XXX	
	Direct Expenses	XXX	
	Variable Production/Factory Overheads	XXX	
	Fixed Production Overheads (Actual Production x Predetermined Rate)	XXX	
		XXX	
Add :	Value of Opening Stock	XXX	
		XXX	
Less :	Value of Closing Stock	XXX	
		XXX	
Add:	Under-absorbed Fixed Factory Overheads	XXX	
		XXX	
Less :	Over-absorbed Fixed Factory Overheads	XXX	XXX
C.	Gross Profit (A- B)		XXX
D.	Administration, Selling and Distribution Overheads :		
	Variable	XXX	
	Fixed	XXX	XXX
E.	Net Income or Profit (C-D)		XXX

Problems

Problem No. 1

The following data relates to XYZ Co. Ltd. Prepare Income Statement according to Absorption Costing Technique.

Normal Capacity	40,000 units per month
Variable Cost per Unit	Rs. 6
Actual Production	44,000 units
Sales	40,000 units @ Rs. 15 per unit
Fixed Manufacturing Overheads	Rs 100,000 per month or Rs. 2.50 per unit
Other Fixed Expenses	Rs 240,000 per month

INCOME STATEMENT

	Rs	Rs.
Sales (40,000 × Rs. 15)		6,00,000
Less: Cost of Goods Manufactured		
Variable Cost @ Rs. 6 per unit 44,000 units	2,64,000	
Fixed Manufacturing Overheads @ Rs.2.5 for 44,000 units	1,10,000	
	3,74,000	
(–) Closing Inventory (4,000 / 44,000 × 3,74,000)	34,000	
	3,40,000	
(–) Over obserption of fixed mfg. overheads (1,10,000 – 1,00,000)	10,000	3,30,000
Contribution		2,70,000
Other fixed expenses		2,40,000
Gross profit		30,000

Problem No. 2

The following data relates to production by ABC Ltd. during the year 2002-2003

Production	50,000 units
Sales	30,000 units @ Rs. 70 per unit
Closing Stock	20,000 units
Fixed Production Cost	Rs. 12,00,000
Variable Production Cost	Rs. 30 per unit
Office & Selling Overheads (Fixed)	Rs. 200,000

Prepare Profit and Loss Account under Absorption Costing.

INCOME STATEMENT

		Rs.
Sales (Rs.20 * 66,000)		13,20,000
Less: Cost of Goods Manufactured		
Variable costs	3,57,000	
Fixed Manufacturing Overheads	70,200	
	4,27,200	
Add: Opening Stock	72,000	
	4,99,200	
Less: Closing Stock		
(4000/60,000*427200)	28,480	
		4,70,720
Gross Profit		8,49,280
Less: Selling Cost		
Fixed	50,000	
Variable	3,40,000	
		3,90,000
Net Income		4,59,280

Problem No. 3

From the following information, prepare income statement under absorption costing.

Normal capacity	1,00,000 units
Units produced	1,10,000 units
Opening stock	5,000 units
Units Sold	1,05,000 units
Selling price per unit	Rs. 30
Direct material cost per unit	Rs. 6
Direct labour cost per unit	Rs. 5
Variable factory overheads per unit	Rs. 4
Fixed manufacturing overheads	Rs. 2,00,000
Variable administration, selling and distribution overheads	Rs. 2 per unit sold
Fixed administration, selling and distribution overheads	Rs. 1,00,000

Solution :

Income Statement Under Absorption Costing

	Particulars	Rs.	Rs.
A.	Sales (1,05,000 × 30)		31,50,000
B.	Cost of Goods Sold :		
	Direct material cost (1,10,000 × 6)	6,60,000	
	Direct labour cost (1,10,000 × 5)	5,50,000	
	Variable factory overheads (1,10,000 × 4)	4,40,000	
	Fixed manufacturing overheads (1,10,000 × 2)	2,20,000	
	[Fixed manufacturing overheads absorption rate=2,00,000 ÷ 1,00,000=2)	18,70,000	
Add :	Opening Stock		
	(5,000 x 17)	85,000	
		19,55,000	
Less :	Closing stock (10,000 x 17)	1,70,000	
		17,85,000	
Less :	Over-absorbed fixed manufacturing overheads		
	(2,20,000 – 2,00,000)	20,000	17,65,000
C.	Gross Profit (A – B)		13,85,000
D.	Administration, selling and distribution overheads :		
	Variable (1,05,000 × 2)	2,10,000	
	Fixed	1,00,000	3,10,000
E.	Net Income or Profit (C – D)		10,75,000

4.6 Comparison of Income Determination Under Absorption and Marginal Costing

Under absorption costing, fixed costs are treated as product costs while marginal costing excludes fixed costs from product costs. The example given here illustrates the method of income determination under absorption and marginal costing :

PROBLEMS

Problem No. 1

When there is no opening or closing stock

Income Statement or Statement of Cost and Profit
(Absorption Costing)

	Product X Rs.	Product Y Rs.	Product Z Rs.	Total Rs.
Sales (A)	15,000	30,000	10,000	55,000
Less : Cost of Sales/ Production :				
Direct Material	3,500	10,000	2,500	16,000
Direct Labour	5,000	8,000	1,500	14,500
Variable Overheads	1,500	2,000	1,000	4.500
Fixed Overheads	1,500	2,500	1,000	5,000
Total Cost (B)	11,500	22,500	6,000	40,000
Net Profit (A-B)	3,500	7,500	4,000	15,000

Solution :

Income Statement or Statement of Cost and Profit
(Marginal Costing)

	Product X Rs.	Product Y Rs.	Product Z Rs.	Total Rs.
Sales (A)	15,000	30,000	10,000	55,000
Less : Cost of Sales/Production :				
Direct Material	3,500	10,000	2,500	16.000
Direct Labour	5,000	8,000	1,500	14,500
Variable Overheads	1,500	2,000	1,000	4.500
Total (B)	10,000	20,000	5.000	35,000
Contribution (A-B)	5,000	10,000	5,000	20,000
Less: Fixed Overheads				5.000
Net Profit				15,000

In the two income statements shown earlier, the net profits arrived at, under absorption costing and marginal costing are the same, this is so because there is no opening or closing stock of finished goods or work-in- process. Valuation of stock in absorption costing is done at total cost (variable plus fixed cost) whereas in marginal costing, it is done at marginal cost i.e., variable cost only. Thus, the amount of profit and loss may be different under the two systems if there are opening or closing stocks.

This point of difference can be well understood with the help of following example.

Problem No. 2

When there are opening or closing stocks

Cost of production (5,000 units)

Variable cost (Rs. 4 per unit) = Rs. 20,000

Fixed cost (Re. 0.20 per unit) = Rs. 1,000

Sales (4,000 units @ Rs. 6 per unit) = 24,000

Closing stock 1000 units

Absorption Costing	**Rs.**	**Marginal Costing**	**Rs.**
Sales	24,000	Sales	24,000
Closing Stock		Closing Stock (1,000 × 4)	
$\left(1,000 \times \frac{21,000}{5,000}\right)$	4,200		4,000
	28,200		28,000
Less : Cost of production	21,000	Less : Variable cost	20,000
Profit	7,200	Contribution	8,000
		Less : Fixed cost	1,000
		Profit	7,000

Problem No. 3

A company produces only one product which had the following costs :

Variable manufacturing costs Rs. 4 per unit

Fixed manufacturing costs Rs. 1,00,000 per annum

The normal capacity is set at 1,00,000 units. There are no work-in-process inventories. Fixed overhead rate is Re. 1 per unit.

In 2013, the company produced 1,00,000 units and sold 90,000 units at a price of `8 per unit. In 2014, the company produced 1,10,000 units and sold 1,15,000 units at the same price.

You are required to prepare income statements for 2013 and 2014 based on absorption costing and variable costing.

Solution :

Income Statement Under Absorption Costing

Particulars	2013	2014	2013 (Rs.)	2014 (Rs.)
(i) Sales at Rs. 8 per unit	90,000×8	1,15,000×8	7,20,000	9,20,000
Variable manufacturing cost at Rs. 4 per unit	1,00,000×4	1,10,000×4	4,00,000	4,40,000
Add: Opening Inventory at Rs. 5 per unit	—	10,000×5	—	50,000
Add: Fixed cost at Re 1 per unit	1,00,000×1	1,10,000×1	1,00,000	1,10,000
			5,00,000	6,00,000
Less: Closing In-ventory at Rs. 5 per unit	10,000×5	5000×5	50.000	25,000
Standard cost of sales			4,50,000	5,75,000
Less : Over Absorption of fixed overheads			—	10,000
(ii) Cost of Sales			4,50,000	5,65,000
Net Income [(i) – (ii)]			2,70,000	3,55,000

Income Statement Under Variable Costing

Particulars	2013	2014	2013 (Rs.)	2014 (Rs.)
(i) Sales at Rs. 8 per unit	90,000×8	1,15,000×8	7,20,000	9,20,000
Variable manufacturing cost at Rs. 4 per unit	1,00,000×4	1,10,000×4	4,00,000	4,40,000
Add: Opening Inventory at Rs. 4 per unit	—	10,000×4	—	40,000
			4,00,000	4,80,000
Less: Closing Inventory at Rs. 4 per unit	10,000×4	5,000×4	40,000	20,000
(ii) Variable cost of Sales			3,60,000	4,60,000
Contribution (i) – (ii)			3,60,000	4,60,000
Less: Fixed cost			1,00,000	1,00,000
Net Income			2,60,000	3,60,000

Problem No. 4

The following are the cost data relating to a factory for two years.

	2013	2014
Installed capacity (in units)	10,000	10,000
Opening Inventory (in units)	Nil	1,000
Closing Inventory (in units)	1000	Nil
Output (in units)	10,000	9,000
Sales (in units)	9,000	10,000
Selling Price per unit (in Rs.)	14	14
Fixed Cost for the year (in Rs.)	85,000	85,000
Variable Cost per unit (in Rs.)	2.90	2.90

You are required to prepare a comparative profitability statement under absorption costing and marginal costing for the two years assuming that materials are issued on First-in-First-out (FIFO) basis.

Solution :

Comparative Profitability Statement

Particulars	Absorption Costing		Marginal Costing	
	2013 (Rs.)	2014 (Rs.)	2013 (Rs.)	2014 (Rs.)
(i) Sales at Rs. 14 per unit	1,26,000	1,40,000	1,26,000	1,40,000
Variable cost at Rs. 2.90 per unit	29,000	26,100	29,000	26,100
Add : Opening Inventory	—	12,340	—	2,900
	29,000	38,440	29,000	29,000
Less : Closing Inventory	11,400	—	2900	—
	17.600	38,440	26,100	29,000
Add : Fixed Cost	85,000	85,000	—	—
(ii) Cost of Sales	1,02,600	1,23,440	26,100	29,000
Margin [(i) – (ii)]	23,400	16,560	99,900	1,11,000
Less : Fixed cost	—	—	85,000	85,000
Net Profit	23,400	16,560	14,900	26,000

Working Notes :

		2013	2014
(i)	Calculation of Sales	9,000 × 14	10,000 × 14
		= Rs. 1,26,000	= 1,40,000
(ii)	Calculation of Variable	10,000 × 2.90	9,000 × 2.90
	Cost	= Rs. 29,000	= Rs. 26,100

(iii) Calculation of opening Inventory

There is no opening inventory in 2013

Opening Inventory in 2014 is 1000 units,

Under absorption costing it is valued at total cost per unit, and under marginal costing it is valued at variable cost.

∴ Under Absorption costing value of opening inventory in 2013

$$= \frac{(85,000 + 26,100)}{9000} \times 1000 = \text{Rs. } 12,340$$

and under variable costing, it is = 1000 × 2.90 = Rs. 2900

(iv) Calculation of Closing Inventory (2014)

Absorption Costing	Marginal Costing
$\frac{(85,000 + 29,100)}{10,000} \times 1000$ = Rs. 11,400	1000 × 2.90 = Rs. 2900

Problem No. 5

ABC Motors assembles and sells motor vehicles. It uses an actual costing system, in which unit costs are calculated on a monthly basis. Data relating to March and April, 2011 are :

	March	April
Unit data:		
Beginning Inventory	0	150
Production	500	400
Sales	350	520

Variable cost data:		
Manufacturing cost per unit produced	Rs. 10,000	Rs. 10,000
Distribution cost per unit sold	3,000	3,000
Fixed cost data :		
Manufacturing costs	Rs. 20,00,000	Rs. 20,00,000
Marketing costs	6,00,000	6,00,000

The Selling Price per motor vehicle is Rs. 24,000.

Required :

(i) Present Income Statements for ABC Motors in March and April 2011 under :

(a) variable costing and

(b) absorption costing.

(ii) Explain the differences between :

(a) and

(b) for March and April.

Solution :

(a) INCOME STATEMENT OF ABC MOTORS UNDER VARIABLE COSTING

Particulars			March Rs.	April Rs.
Sales (i)	24,000×350	24,000×520	84,00,000	1,24.80,000
Variable Cost:				
Manufacturing Cost @ Rs. 10,000			35,00,000	52,00,000
Distribution Cost @ Rs. 3,000			10,50,000	15,60,000
Total Variable Cost (ii)			45,50,000	67,60,000
Contribution [(i) – (ii)]			38,50,000	57,20,000
Less : Fixed Cost:				
Manufacturing Costs	20,00,000	20,00,000		
Marketing Costs	6,00,000	6,00,000	26,00,000	26,00,000
Net Income			12,50,000	31,20,000

(b) INCOME STATEMENT OF ABC MOTORS UNDER ABSORPTION COSTING

		March (Rs.)		April (Rs.)
Sales at Rs. 24.000 per unit		84,00,000		1,24,80,000
Less : Cost of Goods sold :				
Variable Manufacturing Cost	50,00.000		40,00,000	
Fixed Manufacturing Cost	20.00,000		20,00,000	
	70,00,000		60,00,000	
Add : Opening Inventory	—		21,00,000	
	70,00,000		81,00,000	
Less : Closing Inventory	21,00,000	49,00,000	4,50,000	76,50,000
Gross Income		35,00,000		48,30,000
Less : Marketing and Distribution Cost				
Fixed Marketing Cost	6,00,000		6,00,000	
Variable Distribution Cost	10,50,000	16,50,000	15,60,000	21,60,000
Net Income		18,50,000		26,70,000

Working Notes :

		March	April
(i)	Calculation	24,000×350	24,000×520
	of Sales	= Rs. 84,00,000	= Rs. 1,24,80,000
(ii)	Calculation of Variable		
	Manufacturing	10,000×500	10,000×400
	Cost	= Rs. 50,00,000	= Rs. 40,00,000

(iii) Calculation of Opening Inventory

There is no opening inventory in March, opening inventory in April is 150 units, i.e. 500 units produced in March minus 350 units sold during March. Under absorption costing inventory is valued at total cost inclusive of fixed cost. The opening inventory in April has been taken at the value of closing inventory in March calculated as below.

(iv) Calculation of Closing Inventory

For March : $\frac{70,00,000}{500} \times 150 = \text{Rs. } 21,00,000$

For April, closing inventory = 150 + 400 – 520 = 30 units

The value of closing inventory (April) = $\frac{60,00,000}{400} \times 30 = \text{Rs. } 4,50,000$

		March	April
(v)	Calculation of Variable	3,000 × 350	3,000 × 520
	Distribution Cost	= Rs. 10,50,000	= Rs. 15,60,000

The difference in net income under absorption costing and variable costing is as below :

March : Rs. 18,50,000 – 12,50,000 = Rs. 6,00,000

April : Rs. 26,70,000 – 31,20,000 = Rs. 4,50,000

The above shown differences in income are mainly due to the difference in the method of valuation of closing inventory. Under absorption costing, inventory is valued at total cost including fixed cost whereas under variable costing fixed cost is excluded from the same.

4.7 CVP Analysis

Cost-volume-profit (CVP) analysis is a key step in many decisions. CVP analysis involves specifying a model of the relations among the prices of products, the volume or level of activity, unit variable costs, total fixed costs, and the sales mix. This model is used to predict the impact on profits of changes in those parameters.

1. Contribution Margin

Contribution margin is the amount remaining from sales revenue after variable expenses have been deducted. It contributes towards covering fixed costs and then towards profit.

2. Unit Contribution Margin

The unit contribution margin can be used to predict changes in total contribution margin as a result of changes in the unit sales of a product. To do this, the unit contribution margin is simply multiplied by the change in unit sales. Assuming no change in fixed costs, the change in total contribution margin falls directly to the bottom line as a change in profits.

3. Contribution Margin Ratio

The contribution margin (CM) ratio is the ratio of the contribution margin to total sales. It shows how the contribution margin is affected by a given dollar change in total sales. The contribution margin ratio is often easier to work with than the unit contribution margin, particularly when a company has many products. This is because the contribution margin ratio is denominated in sales dollars, which is a convenient way to express activity in multi-product firms.

4.7.1 Objectives of CVP Analysis

The main objectives of cost-volume-profit analysis are given below :

(i) The CVP analysis may be used in determining the break-even-point.

(ii) Fixation of selling prices.

(iii) Selecting the suitable product/sales mix.

(iv) Profit planning and maintaining a desired level of profit.

(v) Determining the optimum level of activity.

(vi) Evaluating the performance.

(vii) Taking many other decisions involving alternative choices such as make or buy decision, accept or reject decisions etc.

4.7.2 Uses of CVP Analysis

CVP analysis is the most important tool of profit planning due to close relationship between cost, volume and profit. It examines the sensitivity of profit to changes in volume, break-even and desired increase in output and sales to achieve budgeted profits. It has wide application in profit planning, cost control, performance evaluation and various other managerial decision areas like price fixation decision - selection of product mix, make or buy decision or a shutdown decisions etc. Some important uses of CVP analysis are as follows :

1. Make or buy decision

CVP analysis, generates information relevant for a make or buy decision by examining the variable cost, fixed cost and purchase price of a product.

2. Shutdown decisions

Determination of shutdown level of prices or output require examination of positive or negative contribution, avoidable fixed cost and shutdown costs and this is enabled by CVP analysis.

3. Introduction of a new product or product line

This involves segregation of costs into fixed and variable and also determination of short term, sustainability and long term profitability. CVP analysis is a valuable tool for this computation.

4. Profit forecasting

Once fixed cost, variable cost and selling price is known, a producer can forecast profit at different levels of output and sales. The expected level of output for a desired level of profit is ascertained by CVP analysis.

Besides the above CVP analysis finds its application in selecting the choice of technology, setting product priorities, optimizing use of scarce of resources etc.

4.7.3 Assumptions Underlying CVP Analysis

CVP analysis is based on the following assumptions :

1. All costs are either fixed or variable
2. Semi-variable costs are not considered to exist
3. Fixed costs remain fixed over a period of time
4. Variable cost per unit remain constant
5. All costs and revenues are linear
6. Technology of production and productive efficiency remain unchanged.
7. The firm produces one product or a constant product wide

4.7.4 Limitations of CVP Analysis

CVP analysis is subject to following limitations :

1. It considers output as the only factor affecting costs but in reality costs are affected by inflation, efficiency and economic and political factors.
2. All costs cannot be segregated into fixed and variable cost which is a pre-requisite for CVP analysis.

3. Total fixed costs do not remain constant beyond certain ranges of activity levels but increase in a step like fashion.
4. CVP analysis assumes a particular sales mix to be constant but in reality sale mix changes with the change in demand.
5. It assumes that costs and sales can be predicted with certainity. However these variables are uncertain.

4.8 Techniques / Elements / Methods of CVP Analysis

The following techniques, called the elements of CVP analysis, are employed in the study of cost-volume-profit analysis :

1. Contribution Margin Concept
2. Marginal Cost Equation
3. Profit-Volume (P/V or C/S) Ratio
4. Break-Even Analysis
5. Margin of Safety
6. Profit-Volume Graph

4.8.1 Contribution of Margin Concept

Contribution is the difference between sales and variable cost or marginal cost of sales. It may also be defined as the excess of selling price over variable cost per unit. Contribution is also known as Contribution Margin or Gross Margin. Contribution being the excess of sales over variable cost is the amount that is contributed towards fixed expenses and profit.

If the selling price of a product is Rs. 20/- per unit and its variable cost is Rs. 15/- per unit, contribution per unit is Rs. 5/- (i.e., Rs. 20 – 15). Further, let us say that the fixed expenses are 50,000 and the total number of units sold is 8,000. This means that the total contribution is 8000 × 5 or Rs. 40,000 which is not sufficient even to meet the fixed expenses and the result is a loss of Rs. 10,000 (50,000 – 40,000). In case, the output is 10,000 units, then total contribution of 50,000 equals the fixed cost, and no amount is left for profit. The profit can be earned only when the amount of contribution exceeds the fixed costs. Hence, any output beyond 10,000 units, will give some profit e.g., at a level of output of 15,000 units, the total contribution is 15,000 x 5 = 75,000 while the fixed costs remain 50,000, thus making a profit of 25,000. Contribution can be represented as :

Contribution = Sales - Variable (Marginal) Cost

or Contribution (per unit) = Selling Price-Variable (or marginal) cost per unit

or Contribution = Fixed Costs + Profit (—Loss)

Advantages of Contribution

The concept of contribution is a valuable aid to management in making managerial decisions. A few benefits resulting from the concept of contribution margin are given below :

1. It helps the management in the fixation of selling prices.
2. It assists in determining the break-even point.
3. It helps management in the selection of a suitable product mix for profit maximisation.
4. It helps in choosing from among alternative methods of production ; the method which gives highest contribution per limiting factor is adopted.
5. It helps the management in deciding whether to purchase or manufacture a product or a component.
6. It helps in taking a decision as regards to adding a new product in the market.

4.8.2 Marginal Cost Equation

For the sake of convenience, a marginal cost equation can be derived as follows:

Sales – Variable cost = Contribution

or, Sales = Variable cost + Contribution

or, Sales = Variable cost + Fixed cost $\pm$ Profit / Loss

or, Sales – Variable cost = Fixed cost $\pm$ Profit / Loss

or, $S - V = F \pm P$

where 'S' stands for Sales

'V' stands for Variable cost

'F' stands for Fixed cost

'P' stands for Profit / Loss

The marginal cost equation is very useful in the sense that if any three factors out of the four are known, the fourth can easily be found out.

PROBLEMS

Problem No. 1

Determine the amount of variable cost from the following particulars :

	Rs.
Sales	1,50,000
Fixed Cost	30,000
Profit	40,000

Solution :

The marginal cost equation is :

Sales – Variable cost = Fixed Cost ± Profit / Loss

or 1,50,000 – V.C. = 30,000 + 40,000

or Variable cost = 1,50,000 – 70,000 = Rs. 80,000.

Problem No. 2

From the following information find out the amount of profit earned during the year using the marginal costing technique :

Fixed Cost	Rs. 2,50,000
Variable Cost	Rs. 10 per unit
Selling price	Rs. 15 per unit
Output level	75,000 units

Solution :

S – V = F + P

Sales = Rs. 75,000 × 15 = Rs. 11,25,000

Variable Cost = 75,000 × 10 = Rs. 7,50,000

Fixed Cost = Rs. 2,50,000

Profit (P) = ?

11,25,000 – 7,50,000 = 2,50,000 + P

3,75,000 = 2,50,000 + P

P = 3,75,000 – 2,50,000

Profit = Rs. 1,25,000

4.8.3 P/V Ratio

The profit / volume ratio, which is also called the 'contribution ratio' or 'marginal ratio', expresses the relation of contribution to sales and can be expressed as under :

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}}$$

Since contribution = Sales – Variable cost = Fixed cost + Profit, P/V ratio can also be expressed as :

$$\text{P/V Ratio} = \frac{\text{Sales} - \text{Variable cost}}{\text{Sales}} \text{ i.e., } \frac{S - V}{S}$$

$$\text{or, P/V Ratio} = \frac{\text{Fixed Cost + Profit}}{\text{Sales}} \text{ i.e., } \frac{F + P}{S}$$

$$\text{or, P/V Ratio} = \frac{\text{Change in profit or Contribution}}{\text{Change in Sales}}$$

This ratio can also be shown in the form of percentage by multiplying by 100. Thus, if selling price of a product is Rs. 20 and variable cost is Rs. 15 per unit, then

$$\text{P/V Ratio} = \frac{20 - 15}{20} \times 100 = \frac{5}{20} \times 100 = 25\%$$

The P/V ratio, which establishes the relationship between contribution and sales is of vital importance for studying the profitability of operations of a business. It reveals the effect on profit of changes in the volume. In the above example, for every Rs. 100 sales, Contribution of Rs. 25 is made towards meeting the fixed expenses and then the profit comparison for P/V ratios can be made to find out which product, department or process is more profitable. Higher the P/V ratio, more will be the profit and lower the P/V ratio, lesser will be the profit. Thus, every management aims at increasing the P/V ratio.

The ratio can be increased by increasing the contribution. This can be done by:

(i) Increasing the selling price per unit

(ii) Reducing the varible or marginal cost.

(iii) Changing the sales mixture and selling more profitable products for which the P/V ratio is higher.

The concept of P/V ratio is also useful to calculate the break-even point, the profit at a given volume of sales, the sales volume required to earn a given (or desired) profit and the volume of sales required to maintain the present profits if the selling price is reduced by a specified percentage.

The formula for the sales volumes required to earn a given profit is :

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}}$$

$$\text{or, P/V Ratio} = \frac{\text{Fixed Cost + Profit}}{\text{P / V Ratio}}$$

$$\text{or, Sales} = \frac{\text{Fixed Cost + Profit}}{\text{P / V Ratio}} = \frac{F + P}{\text{P / V Ratio}}$$

PROBLEMS

Problem No. 1

Sales	Rs. 1,00,000
Profit	Rs. 10,000
Variable Cost	70%

Find out (i) P/V Ratio, (ii) Fixed Cost, (iii) Sales volume to earn a profit of Rs. 40,000

Solution :

Sales = Rs. 1,00,000

Variable Cost = 70% = $\frac{70}{100}$ × 1,00,000 = Rs. 70,000

(i) P/V Ratio = $\frac{\text{Sales} - \text{Variable Cost}}{\text{Sales}} \times 100 = \frac{1,00,000 - 70,000}{1,00,000} \times 100$

= 30%

(ii) Contribution = Fixed Cost + Profit or, 30,000 = Fixed Cost + 10,000

= Rs. 20,000 or, Fixed Cost = 30,000 – 10,000

(iii) Sales = $\frac{\text{Fixed Cost + Profit}}{\text{P / V Ratio}} = \frac{20,000 + 40,000}{30\%} = \frac{60,000 \times 100}{30}$

= Rs. 2,00,000

Proof :

Sales	2,00,000
Variable Cost (70%)	1,40,000
Contribution	60,000
Fixed Cost	20,000
Profit	40,000

Problem No. 2

Sale of a product amounts to 200 units per month Rs. 10 per unit. Fixed overhead cost is Rs. 400 per month and variable cost is Rs. 6 per unit. There is a proposal to reduce prices by 10 percent. Calculate present and future P/V ratio. How many units must be sold to earn the present total profits ?

Solution :

Present P/V Ratio

Sales = 200 × 10 = Rs. 2,000

Variable Cost = 200 × 6 = Rs. 12,00

Contribution = Sales – Variable Cost

= 2,000 – 1,200 = Rs. 800

P/V Ratio = $\frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{800}{2000} \times 100 = 40\%$

P/V Ratio after reducing price by 10%

	Rs.
Present Price per unit	10
Less : Reducing 10%	1
Future Price per unit	9
Variable Cost per unit	6
Contribution per unit	3

P/V ratio = $\frac{C}{S} \times 100 = \frac{3}{9} \times 100 = 33\frac{1}{3}\%$

Future Sales for Earning Present Profits

Present Profit = Contribution – Fixed Cost

= 800 – 400 = Rs. 400

So, we have to find out the volume of Sales to earn a profit of Rs. 400

$$\text{Sales} = \frac{\text{Fixed Cost + Profit}}{\text{P / V Ratio}}$$

$$= \frac{400 + 400}{33\frac{1}{3}\%} = \frac{800}{\frac{1}{3}}$$

$$= \frac{800 \times 3}{1} = \text{Rs. } 2{,}400$$

$$\text{Sales in units} = \frac{2{,}400}{9} = 267 \text{ units.}$$

Problem No. 3

The sales turnover and profit during two years were as follows :

Year	Sales Rs.	Profit Rs.
2013	1,40,000	15,000
2014	1,60,000	20,000

You are required to calculate :

(i) P/V Ratio

(ii) Sales required to earn a profit of Rs. 40,000

(iii) Profit when sales are Rs. 1,20,000.

Solution :

(i) $\text{P/V Ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100$

$$= \frac{5{,}000}{20{,}000} \times 100 = 25\%$$

(ii) Sales required to earn a profit of Rs. 40,000

$$\text{P/V Ratio} = \frac{\text{Fixed Cost + Profit}}{\text{Sales}}$$

or $\frac{25}{100} = \frac{F + 15{,}000}{1{,}40{,}000}$

or $\frac{1{,}40{,}000 \times 25}{100} = F + 15{,}000$

$35{,}000 - 15{,}000 = F$

or Fixed Cost = Rs. 20,000

or $\text{Desired Sales} = \frac{F + P}{\text{P / V Ratio}}$

$$= \frac{20{,}000 + 40{,}000}{\frac{25}{100}}$$

$$= \frac{60{,}000 \times 100}{25} = \text{Rs. } 2{,}40{,}000$$

(iii) Profit when sales are Rs. 1,20,000

$$S = \frac{F + P}{\text{P / V Ratio}}$$

S × P/V Ratio = F + P

or $1{,}20{,}000 \times \frac{25}{100} = 20{,}000 + P$

or 30,000 = 20,000 + P

or Profit = 30,000 – 20,000 = Rs. 10,000

Problem No. 4

Asterix Ltd., has provided the following information.

Sales = 40,000 units @ Rs. 5 per unit

Variable Cost = Rs. 4 per unit

Fixed cost = Rs. 8000 pa.

Calculate P/V Ratio

Solution :

$$\text{P/V Ratio} = \frac{\text{Sales} - \text{VC}}{\text{Sales}} \times 100 = \frac{2,00,000 - 1,60,000}{2,00,000} \times 100$$

$$= \frac{40,000}{20,0000} \times 100$$

$$\text{Or} \quad \frac{\text{Selling Price Unit} - \text{VC / Unit}}{\text{Selling Price per unit}} \times 100$$

$$\frac{5-4}{5} \times 100 \quad \frac{1}{5} \times 100 = 20\%$$

Problem No. 5

A Producer breaks even at a sale of Rs. 40,00,000. The existing P/V Raio is 60%. Calculate revised BEP after 20% increase in fixed cost, 30% increase in variable cost per unit and only 10% increase in selling price.

Solution :

Old Fixed Cost = BEP × P/V Ratio

= 40,00,000 × 60%

= Rs. 24,00,000

New Fixed Cost = $24,00,000 \times \frac{(120)}{100}$: 20% increase

= Rs. 28,80,000

New Selling price = $100 \times \frac{110}{100}$ = 110 : .10% increase

New Variable cost = $40 \times \frac{130}{100}$ = Rs. 52 : .30% increase

$$\text{New P/V Ratio} = \frac{\text{New Sales} - \text{New Variable Cost}}{\text{New Sales}}$$

$$= \frac{110-52}{110} = \frac{58}{110}$$

= 52.72%

$$\text{New BEP} = \frac{\text{New Fixe Cost}}{\text{New P/V Ratio}}$$

$$= \frac{28,80,000}{.5272} = 54,62,069.$$

Significance of P/V Ratio

P/V Ratio indicates rate of profitability associated with growth in sales value. A high P/V ratio suggests that with the increase in Sales, Profits will increase at higher rate, assuming that there is no increase in fixed cost. In such cases, a firm would reap more profits by spending on Advertisements and other sale promotion campaigns to boost sales.

In periods of depression, a high P/V ratio suggests that a producer can reduce his price without incurring much losses.

Given the fixed cost a higher P/V Ratio results in lower BEP and hence lower risk. Low P/V ratio leads to high BEP and high risk.

Factors to be considered to improve P/V Ratio

A high P/V Ratio is an indicator of sound financial performance of a company's product. P/V ratio can be improved, if contribution is increased and in order to increase the contribution the following factors have to be considered.

- Increase in sale prices through sales promotion, product improvement etc.
- Reduction in variable cost per unit.
- Concentration on Sales of products with relatively better PV ratio.

P/V Ratio and Desired Profits

Using P/V ratio the sales value to earn the desired profit can be calculated by the formula.

$$\text{Desired Sales} = \frac{\text{Fixed Cost + Profit}}{\text{P/V Ratio}}$$

$$\text{Or Desired Sales} = \frac{\text{Desired Contribution}}{\text{P/V Ratio}}$$

Or Fixed Cost - Actual Sale x P/V Ratio - Profit

Profit = Actual Sale x P/V Ratio - Fixed Cost.

Problem No. 6

The P/V Ratio of a company's product is 50%.

Fixed cost per month is Rs.4,00,000. At what monthly sale he will earn a profit of Rs.80,000 per month.

$$DS = F + P = \frac{4,00,000 + 80,000}{\frac{50}{100}}$$

$$\frac{4,80,000 \times 100}{50} = 9,60,000$$

Problem No. 7

A firm is selling 20,000 Units of a product which yields a contribution Rs. 30 per unit and has a P/V ratio of 40%. The present profit of the firm is Rs. 1,00,000. calculate BEP, Fixed Cost, Selling Price, Per Unit variable cost and sales to earn a profit of Rs.2,00,000.

Solution :

Let Selling price be S

Given P/V Ratio 40% = .4

Therefore Unit Variable Cost = Selling Price x P/V Ratio

= S × .4

Given contribution = 30 Rs per unit

Therefore S - AS = 30

S - 4S = 30

10

$$\frac{10S - 4S}{10} = 30 = 10S - 4S = 300$$

$$6S = 300$$

$$S = \frac{300}{6} = 50 \text{ Rs.}$$

Present Total Contribution = 30 × 20,000 = 6,00,000

Fixed cost = Total contribution - Profit = 6,00,000 – 1,00,000 = 5,00,000 Rs.

$$BEP = \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$$

$$= \frac{5,00,000}{4}$$

$$= \frac{5,00,000}{4} \times 100$$

= 12,50,000 Rs.

Sales to earn a profit of 2.00.000 $\frac{F + P}{\text{P/V Ratio}}$

$$DS = \frac{5,00,000 + 2,00,000}{.4}$$

$$\frac{7,00,000}{4} \times 10 = 17,50,000.$$

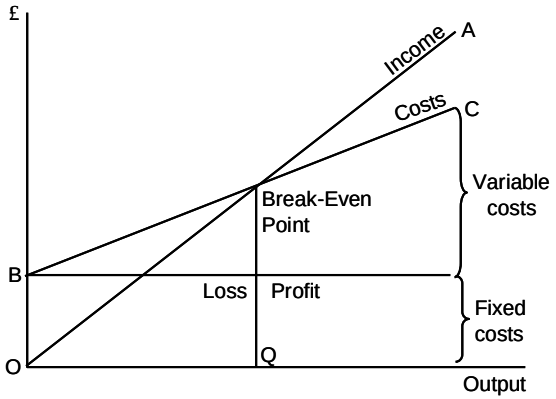
4.8.4 Break-Even Analysis

Break-even analysis is a technique widely used by production management and management accountants. It is based on categorising production costs between those which are "variable" (costs that change when the production output changes) and those that are "fixed" (costs not directly related to the volume of production).

Total variable and fixed costs are compared with sales revenue in order to determine the level of sales volume, sales value or production at which the business makes neither a profit nor a loss (the "break-even point").

The Break-Even Chart

In its simplest form, the break-even chart is a graphical representation of costs at various levels of activity shown on the same chart as the variation of income (or sales, revenue) with the same variation in activity. The point at which neither profit nor loss is made is known as the "break-even point" and is represented on the chart below by the intersection of the two lines:



In the diagram above, the line OA represents the variation of income at varying levels of production activity ("output"). OB represents the total fixed costs in the business. As output increases, variable costs are incurred, meaning that total costs (fixed + variable) also increase. At low levels of output, Costs are greater than Income. At the point of intersection, P, costs are exactly equal to income, and hence neither profit nor loss is made.

Fixed Costs

Fixed costs are those business costs that are not directly related to the level of production or output. In other words, even if the business has a zero output or high output, the level of fixed costs will remain broadly the same. In the long term fixed costs can alter - perhaps as a result of investment in production capacity (e.g. adding a new factory unit) or through the growth in overheads required to support a larger, more complex business.

Examples of Fixed Costs

- Rent and rates
- Depreciation
- Research and development
- Marketing costs (non- revenue related)
- Administration costs

Variable Costs

Variable costs are those costs which vary directly with the level of output. They represent payment output-related inputs such as raw materials, direct labour, fuel and revenue-related costs such as commission.

A distinction is often made between "Direct" variable costs and "Indirect" variable costs.

Direct variable costs are those which can be directly attributable to the production of a particular product or service and allocated to a particular cost centre. Raw materials and the wages those working on the production line are good examples.

Indirect variable costs cannot be directly attributable to production but they do vary with output. These include depreciation (where it is calculated related to output - e.g. machine hours), maintenance and certain labour costs.

Semi-Variable Costs

Whilst the distinction between fixed and variable costs is a convenient way of categorising business costs, in reality there are some costs which are fixed in nature but which increase when output reaches certain levels. These are largely related to the overall "scale" and/or complexity of the business. For example, when a business has relatively low levels of output or sales, it may not require costs associated with functions such as human resource management or a fully-resourced finance department. However, as the scale of the business grows (e.g. output, number people employed, number and complexity of transactions) then more resources are required. If production rises suddenly then some short-term increase in warehousing and/or transport may be required. In these circumstances, we say that part of the cost is variable and part fixed.

Assumptions of Break-even Analysis

The break-even analysis is based upon the following assumptions :

i) All elements of cost, i.e., production, administration and selling and distribution can be segregated into fixed and variable components.

ii) Variable cost remains constant per unit of output irrespective of the level of output and thus fluctuates directly in proportion to changes in the volume of output.

iii) Fixed cost remains constant at all volumes of output.

iv) Selling price per unit remains unchanged or constant at all levels of output.

v) Volume of production is the only factor that influences cost.

vi) There will be no change in the general price-level.

vii) There is only one product or in case of multi-products, the sales mix remains unchanged.

viii) There is synchronisation between production and sales.

4.9 Break-even Point

The break-even point may be defined as that point of sales volume at which total revenue is equal to total cost. It is a point of no profit, no loss. A business is said to break-even when its total sales are equal to its total costs. The break-even point refers to that level of output which evenly breaks the costs and revenues and hence the name.

At this point, contribution, i.e., sales minus marginal cost, equals the fixed costs and hence this point is often called as 'Critical Point' or 'Equilibrium Point' or 'Balancing Point' or no profit, no loss. If production/sales is increased beyond this level, there shall be profit to the organisation and if it is decrease from this level, there shall be loss to the organisation.

Break-even point can be stated in the form of an equation :

Sales revenue at break-even point = Fixed Cost + Variable Costs

Computation of The Break-even Point

The break-even point can be computed by the following methods :

(i) The Algebraic Formula Method

(ii) Graphic or Chart Method.

4.10 Algebraic Formula Method For Computing The Break-even Point

The break-even point can be computed in terms of:

(a) Units of sales volume.

(b) Budget total or in terms of money value.

(c) As a percentage of estimated capacity.

a) Break-Even Point in Units

As the break-even point is the point of no profit no loss, it is that level of output at which the total contribution equals the total fixed costs, It can be calculated with the help of following formula :

$$\text{Break-even Point} = \frac{\text{Fixed Cost}}{\text{Selling Price per unit} - \text{Variable Cost per unit}}$$

$$= \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$$

b) Break-even Point in terms of budget-total or money value

At break-even point :

Total Sales = Total Fixed Cost + Total Variable Cost

or $S = F + V$

(where S = Sales, F = Fixed Cost and V = Variable cost)

or $S - V = F$

or $\frac{S-V}{S-V} = \frac{F}{S-V}$ (Dividing both sides by S – V)

or $1 = \frac{F}{S-V}$

or $S \times 1 = \frac{F \times S}{S-V}$ (Multiplying both sides by S)

$$\text{Hence, break-even sales} = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable Cost}} \times \text{Sales}$$

$$= \frac{\text{Fixed Cost}}{\text{Contribution}} \times \text{Sales}$$

With the use of P/V Ratio, B.E.P.

$$= \frac{\text{Fixed Cost}}{\text{P / V Ratio}} \left(\text{As, } \frac{\text{Contribution}}{\text{Sales}} = \text{P / V Ratio} \right)$$

c) Break-even Point as a percentage of estimated capacity

Break-even point can also be computed as a percentage of the estimated sales or capacity by dividing the break-even sales by the capacity sales. For example, if a firm has an estimated capacity of 1,00,000 units of products and its break-even point is reached at 50,000 units, then the break-even point is at 50% of capacity (1,00,000/50,000). If information as to total contribution at full capacity is available, the break-even point as a percentage of estimated capacity can be found as under :

$$\text{B.E.P (as \% age of capacity)} = \frac{\text{Fixed Cost}}{\text{Total Contribution}}$$

PROBLEMS

Problem No. 1

From the following information, calculate the break-even point in units and in sales value:

Output	= 3,000 units
Selling price per unit	= Rs. 30
Variable cost per unit	= Rs. 20
Total fixed cost	= Rs. 20,000

Solution :

$$\text{Break-even point (in units)} = \frac{\text{Fixed Cost}}{\text{Selling Price per unit} - \text{Variable Cost}}$$

$$= \frac{20,000}{30-20} = \frac{20,000}{10} = 2,000 \text{ units.}$$

$$\text{Break-even point (in Sales Value)} = \frac{\text{Fixed Cost} \times \text{Sales}}{\text{Sales} - \text{Variable Cost}}$$

Fixed Cost = Rs. 20,000 (given)

Sales = 3,000 × 30 = Rs. 90,000

Variable Cost = 3,000 × 20 = Rs. 60,000

$$\text{Hence, B.E.P. (In Sales Value)} = \frac{20,000 \times 90,000}{90,000 - 60,000}$$

$$= \frac{20,000 \times 90,000}{30,000} = \text{Rs. } 60,000.$$

Otherwise, as the B.E.P. is 2,000 units, break-even sales would be :

2,000 × 30 = Rs. 60,000

Problem No. 2

From the following particulars, calculate :

(i) Break-even point in terms of sales value and in units.

(ii) Number of units that must be sold to earn a profit of Rs. 90,000.

	Rs.
Fixed Factory Overheads Cost	60,000
Fixed Selling Overheads Cost	12,000
Variable Manufacturing Cost per unit	12
Variable Selling Cost per unit	3
Selling Price per unit	24

Solution :

(i) $$\text{Break-even point} = \frac{\text{Fixed Cost}}{\text{Selling Price per unit} - \text{Variable Cost per unit}}$$

Variable Cost per unit = Rs. 12 + 3 = Rs. 15

Total Fixed Cost = Rs. 60,000 + 12,000 = Rs. 72,000

$$\text{B.E.P.} = \frac{72,000}{24-15} = 8,000 \text{ units}$$

B.E.P. (in sales value) = 8,000 × 24 = Rs. 1,92,000

(ii) Number of units that must be sold to earn profit of Rs. 90,000

$$= \frac{\text{Fixed Cost + Profit}}{\text{Selling Price per unit} - \text{Variable Cost per unit}}$$

$$= \frac{72,000 + 90,000}{24-15} = \frac{1,62,000}{9} = 18,000 \text{ units}$$

Problem No. 3

From the following data, you are required to calculate :

(a) P/V ratio

(b) Break-even sales with the help of P/V ratio.

(c) Sales required to earn a profit of Rs. 4,50,000

Fixed Expenses	= Rs. 90,000
Variable Cost per unit:	
Direct Material	= Rs. 5
Direct Labour	= Rs. 2
Direct Overheads	= 100% of Direct Labour
Selling Price per unit	= Rs. 12.

Solution :

		Rs.
Selling price per unit		12
Less : Variable cost per unit :		
Direct Material	5	
Direct Labour	2	
Direct Overheads	2	
		9
Contribution per unit		3

(a) $\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$

$= \frac{3}{12} \times 100 = 25\%$

(b) $\text{Break-even Sales} = \frac{\text{Fixed Expenses}}{\text{P / V Ratio}}$

$= \frac{90,000}{\frac{25}{100}} = \frac{90,000 \times 100}{25} = \text{Rs. } 3,60,000$

(c) Sales required to earn a profit of Rs. 4,50,000

$= \frac{\text{Fixed Expenses + Desired Profit}}{\text{P / V Ratio}}$

$= \frac{90,000 + 4,50,000}{25\%} = \frac{5,40,000}{\frac{25}{100}}$

$= \frac{5,40,000 \times 100}{25} = \text{Rs. } 21,60,000$

Problem No. 4

From the following data, you are required to calculate break even point and net sales value at this point.

	Rs.
Direct material cost per unit	10
Direct labour cost per unit	5
Fixed overhead	50,000
Variable overheads @ 60% on direct labour	
Selling price per unit	25
Trade discount	4%

If sales are 10% and 25% above the break even volume, determine the net profits.

Solution :

			Rs.
Selling price per unit			25
Less : Trade discount (25 × 4/100)			1
Net selling price per unit			24
Less : Variable cost per unit		Rs.	
Direct Material		10	
Direct Labour		5	
Variable overheads (5 × 60/100)		3	18
Contribution per unit			6

$$\text{Break-even point (in units)} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}} = \frac{50,000}{6} = 8,333 \text{ units}$$

$$\text{Break-even Point (in sales value)} = \frac{\text{Fixed Cost}}{\text{P / V Ratio}}$$

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{6}{24} \times 100 = 25\%$$

$$\text{Hence, B.E.P. (in sales value)} = \frac{50,000}{25\%} = 50,000 \times \frac{100}{25} = \text{Rs. } 2,00,000$$

Profit when sales are 10% above the break even volume

Sales = 2,00,000 + 10% of 2,00,000 = Rs. 2,20,000

Contribution = Sates × P/V Ratio = 2,20,000 × 25/100 = Rs. 55, 000

Contribution = Fixed Cost + Profit

Rs. 55,000 = 50,000 + Profit

Profit = Rs. 5,000

Profit when sales are 25% above the break even volume

Sales = 2,00,000 + 25% of 2,00,000 = Rs. 2,50,000

Contribution = 2,50,000 × 25/100 = Rs. 62,500

Contribution = Fixed Cost + Profit

62,500 = 50,000 + Profit

Profit = Rs. 12,500

4.10.1 Cash Break-even Point

In the present competitive world of business, it may be difficult for new industrial units to achieve the break-even point in the initial years. Thus, the concept of cash break-even point has emerged. The cash break-even point may be defined as that point of sales volume at which total revenue is equal to total cash cost. At this point,

cash contribution (which is calculated after making adjustment for variable portion of depreciation, etc.) equals the cash fixed cost, *i.e.,* fixed cost excluding depreciation and deferred expenses. This point enables the management to determine the level of activity below which the liquidity position of the firm would be adversely affected. Thus, cash break-even point may be calculated as below :

$$\text{Cash Break-Even Point (in units)} = \frac{\text{Cash Fixed Cost}}{\text{Cash Contribution per unit}}$$

Problem

From the following information, calculate the cash Break-Even Point.

	Rs.
Selling Price per unit	40
Variable cost per unit	30
Depreciation included in above per unit	5
Fixed cost	1,00,000
Depreciation included in fixed cost	25,000

Solution :

Cash Fixed Cost = Rs. 1,00,000 – 25,000 = Rs. 75,000

Cash contribution per unit = Rs. 40 – (30 – 5) = Rs. 15

$$\text{Cash Break-Even Point} = \frac{\text{Cash Fixed Cost}}{\text{Cash contribution per unit}}$$

$$= \frac{75,000}{15} = 5,000 \text{ units}$$

Cash Break-Even Point in sales value = Rs. 5,000 × 40 = Rs. 2,00,000

4.10.2 Composite Break-even Point (Multi Product Situation)

So far we have dealt with break-even point of firms producing single product. We can also calculate the composite break-even point for a Firm producing several products, as below :

$$\text{Composite Break-Even Point (in Sales value)} = \frac{\text{Total Fixed Cost}}{\text{Composite P/V Ratio}}$$

$$\text{and, Composite P/V Ratio} = \frac{\text{Total Contribution}}{\text{Total Sales}} \times 100$$

Problem

From the following information of a company producing three products, yor are required to compute (a) Composite P/V Ratio, and (b) Composite Break-Even Point :

Product	Sales Revenue	Variable Cost
X	Rs. 20,000	Rs. 10,000
Y	40,000	14,000
Z	60,000	36,000
Fixed costs : Rs. 50,000		

Solution :

Product	Sales Revenue (Rs)	Variable Cost (Rs)	Contribution (S – V) (Rs)	P/V Ratio $\left(\frac{C}{S} \times 100\right)$
X	20,000	10,000	10,000	50%
Y	40,000	14,000	26,000	65%
Z	60,000	36,000	24,000	40%
Total	1,20,000	60,000	60,000	50%

(a) $$\text{Composite P/V Ratio} = \frac{\text{Total Contribution}}{\text{Total Sales}} \times 100$$

$$= \frac{60,000}{1,20,000} \times 100 = 50\%$$

(b) $$\text{Composite Break-Even Point (in sale value)} = \frac{\text{Total Fixed Costs}}{\text{Composite P/V Ratio}}$$

$$= \frac{50,000}{50\%} = \text{Rs. } 1,00,000$$

4.10.3 Operating Leverage and Risk

Operating leverage results from the presence of fixed costs that help in magnifying net operating income fluctuations flowing from small variations in revenue. The fixed cost is treated as fulcrum of a leverage. The changes in sales are related to changes in revenue. The fixed costs do not change with the change in sales. Any increase in sales, fixed costs remaining the same, will magnify the operating revenue.

The operating leverage occurs when a firm has fixed costs which must be recovered irrespective of sales volume. The fixed costs remaining same, the percentage change in operating revenue will be more than the percentage change in sales. The occurrence is known as operating leverage. The degree of operating leverage depends upon the amount of fixed elements in the cost structure. Operating leverage can be determined by means of a break even or cost volume profit analysis. The degree of leverage will be calculated as:

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{Operating Profit}}$$

Contribution = Sales – Variable cost

Operating Profit = Sales – Variable Cost – Fixed Cost

or O.P. = Contribution – Fixed Cost

The break even point can be calculated by dividing the fixed cost by percentage of contribution to sales or P/V Ratio.

$$\text{Break Even Point} = \frac{\text{Fixed Cost}}{\text{P / V Ratio}}$$

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}}$$

When production and sales move above the break even point, the firm enters highly profitable range of activities. At break even point the fixed costs are fully recovered, any increase in sales beyond this level will increase profits equal to contribution. A firm operating with a high degree of leverage and above break even point earns good amount of profits.

If a firm does not have fixed costs then there will be no operating leverage. The percentage change in sales will be equal to the percentage change in profit. When fixed costs are there, the percentage change in profits will be more than the percentage in sales volume.

Thus, degree of operating leverage can be computed as below :

$$\text{Degree of Operating Leverage} = \frac{\text{Percentage Change in Profits}}{\text{Percentage Change in Sales}}$$

Risk Factor

It is true that a high leveraged situation will magnify the operating profits but it brings in the risk element too. The percentage change in profits will be more in a situation with higher fixed costs as comparted to that where fixed costs are lower. The higher degree of leverage brings in more decrease in operating profits. This situation can be illustrated with the help of the following illustration.

Problem

Following information is taken from the records of a hypothetical company:

Installed capacity	1,000 units
Operating capacity	800 units
Selling price per unit	Rs. 10
Variable cost per unit	Rs. 7

Calculate operating leverage under the following situations and comment :

Fixed cost:	Rs.
Situation A	800
Situation B	1,200
Situation C	1,500

Solution :

	Situation A Rs.	Situation B Rs.	Situation C Rs.
Sales 8,000	8,000	8,000	8,000
Less : Variable cost	5,600	5,600	5,600
Contribution (C)	2,400	2,400	2,400
Less: Fixed Cost (F)	800	1,200	1,500
Operating Profit (OP)	1,600	1,200	900
Operating leverage	2,400	2,400	2,400
$\left(\frac{C}{OP}\right)$	1,600	1,200	900
	1.5	2.0	2.67
Break Even Point (BEP)			
$\left(\frac{F}{C} \times S\right)$	2,667	4,000	5,000
Margin of Safety Ratio			
$\left(\frac{OP}{C}\right)$	66.7%	50%	37.5%
Percentage of sales at break even point	33.3%	50%	62.5%

Comments

A 10 per cent increase in sales would be accompanied by an increase in operating profits of 15% in situation A, 20% in situation B and 26.7% in situation C. Situation C is of high operating leverage since the operating profit will increase by one 2½ times (26.7% for every 10% increase in Sales). This is high risk situation too because a small decrease in sales will result in more decrease in profits.

The margin of safety ratio is 66.7% in situation A which means that a sales decrease of this percentage will bring the firm to break even point (no profit no loss point). This ratio in situation C is only 37.5% which means that the company can reach the break even situation much more early as compared to situation A. Taking the percentage of sales at break even point, it will reach at 33.3% of sales in situation A, 50% in situation B and 62.5% in situation C. In situation A the company will start earning profit at an early stage of sales while in situation C it will reach only beyond 62.5% in situation C. In situation A the company will start earning profit at an early stage of sales while in situation C, it will reach only beyond 62.5% of sales.

A high operating leverage (situation C) has low margin of safety and has thin cushion for absorbing shocks whereas a situation of low operating leverage (situation A) has higher margin of safety ratio. This situation is less risky because any decrease in sales will not bring down the profits at a higher rate. It can be concluded that a high leveraged situation brings in more profits with the increase in sales but at the same time it brings in more risk too.

4.11 Margin of Safety

The excess of actual or budgeted sales over the break-even sales is known as the margin of safety. It is the difference between actual sales minus the sales at break-even point. It represents the amount by which sales revenue can fall before a loss is incurred. As at break-even point there is no profit no loss, sales beyond the break-even point represent margin of safety because any sales above the break-even point will give some profit. Thus,

Margin of Safety = Total Sales – Sales at Break Even Point.

Say, actual present sales are Rs. 5,00,000 and the break-even sales are Rs. 4,00,000, then margin of safety is equal to Rs. 1,00,000, i.e., 5,00,000 – 4,00,000.

Margin of Safety can also be expressed in percentage. For example, if a company can break-even at 60 per cent of the expected sales ; then it has a margin of safety of (100 – 60) 40 per cent. In the previous example, margin of safety in percentage can be calculated as $\frac{1,00,000}{5,00,000} \times 100 = 20\%$.

Margin of safety calculated in percentage is also known as Margin of Safety Ratio and can be expressed as :

$$\text{M.S. Ratio} = \frac{\text{M.S.}}{\text{Sales}} \times 100$$

$$= \frac{\text{Actual Sales} - \text{Sales at B.E.P.}}{\text{Sales}} \times 100$$

Margin of safety can also be calculated with the help of the following formula

$$\text{Margin of Safety (M/S)} = \frac{\text{Profit}}{\text{P/V Ratio}}$$

This is so because margin of safety is the volume of sales beyond break-even point and all sales above the break-even point give some profit which can be calculated as :

$$\text{Profit} = \text{Margin of Safety} \times \text{P/V ratio}$$

or $$\text{M.S.} = \frac{\text{Profit}}{\text{P/V Ratio}} \times 100$$

The size of the margin of safety is an important indicator of the strength of a business. The large margin of safety indicates that the business is sound and even if there is a substantial fall in sales, there will still be some profit. On the other hand, small margin of safety indicates that position of the business is comparatively weak and even a small decline in the sales would adversely affect the profit of the business and may result into losses. The margin of safety can be improved by taking the following steps :

1. By increasing the level of production
2. By increasing the selling price
3. By reducing the fixed cost
4. By reducing the variable cost
5. By substituting unprofitable products with profitable products
6. By increasing contribution by changing the sales mix or by dropping unprofitable products.

4.12 Graphic Method of Break-Even Analysis / Break-Even Chart

The break-even point can also be computed graphically. A break-even chart is a graphical representation of marginal costing. The break-even chart 'Portrays a pictorial view of the relationships between costs, volume and profits.' It shows the break-even point and also indicates the estimated profit or loss at various levels of output. The break-even point as indicated in the chart is the point at which the total cost line and the total sales line intersect.

There are three methods of drawing a break-even chart. These methods of drawing break-even chart have been explained with the help to the following illustration.

Problem

Plot the following data on a graph (break-even chart) and determine (a) break-even point (b) profit if the output is 25,000 units.

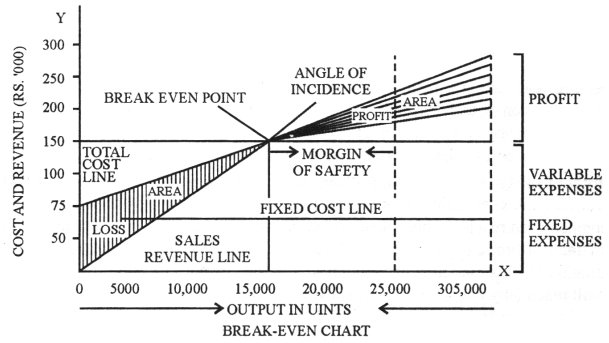
Output (units)	Variable Cost (per unit) Rs.	Total Variable Cost Rs.	Fixed Expenses Rs.	Total Cost Rs.	Selling Price (per unit) Rs.	Total Sales Rs.
0	5	0	75,000	75,000	10	0
5,000	5	25,000	75,000	1,00,000	10	50,000
10,000	5	50,000	75,000	1,25,000	10	1,00,000
15,000	5	75,000	75,000	1,50,000	10	1,50,000
20,000	5	1,00,000	75,000	1,75,000	10	2,00,000
25,000	5	1,25,000	75,000	2,00,000	10	2,50,000
30,000	5	1,50,000	75,000	2,25,000	10	3,00,000

Solution :

First Method

Under this method following steps are taken to draw the break-even chart:

1. Volume of production/output or sales is plotted on horizontal axis, i.e., X-axis. The volume of sales or production may be expressed in terms of rupees, units or as a percentage of capacity.
2. Costs and sales revenue are represented on vertical axis, i.e., Y-axis.
3. Fixed cost line is drawn parallel to X-axis. The line indicates that fixed expenses remain constant at all levels of activity.



BREAK-EVEN CHART

4. The variable costs for different levels of activity are plotted over-the fixed cost line. The variable cost line is joined to fixed cost line at zero level of activity. As the variable cost line is drawn above the fixed cost line, it represents the total cost at various levels of output/sales.

5. Sales values at various levels of output are plotted and a line is drawn joining these plotted points. This line is called the sales (revenue) line.

6. The point of intersection of total cost line and sales (revenue) line is called the break-even point.

7. The number of units to be produced at break-even point can be determined by drawing a perpendicular to the X-axis from the point of intersection of cost and sales line.

8. The sales revenue at break-even point can be determined by drawing a perpendicular to the X- axis from the point of inter-section of cost and sales line.

9. The area below the break-even point represents the loss area as the total sales and less than the total cost and the area above the break-even point indicates the area of profit as the sales revenue exceeds the total cost.

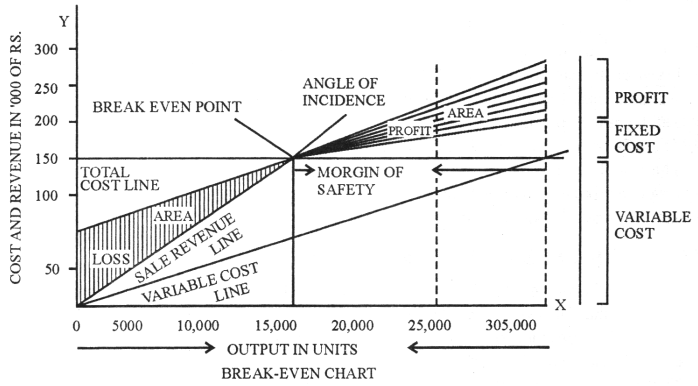
Second Method

The break-even chart can also be drawn by another method which is a variation of the first method. Under this method, the variable cost line is drawn first and then fixed cost line is drawn over and parallel to the variable cost line. The fixed cost line, so drawn, represents the total cost (Variable + Fixed) at various levels of output because it is drawn above the variable cost line. This method is useful to the management for decision making because it reveals additional information :

(a) The variable costs are shown directly for various levels of output/sales.

(b) Marginal contribution at various levels of sales is indicated clearly by the difference between sales line and variable cost line.

(c) It indicates the recovery of fixed costs at various levels of production.



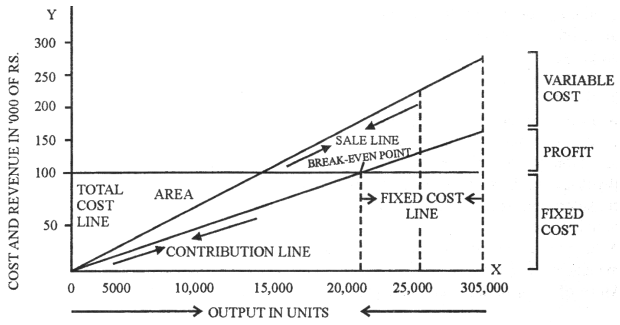
BREAK-EVEN CHART

A small variation of this method is that of showing the various elements of fixed and variable costs, for example, major cost elements such as direct material cost, labour cost, variable factory overhead cost, variable selling overhead and fixed costs.

Third Method - Contribution Break-even Chart

This is a modified form of a simple break-even chart as shown in the first-two methods above. Under this method total cost line is not drawn, rather another line called contribution line is drawn from the origin and this line goes up with the increase in the level of output. The fixed cost line is drawn parallel to the x-axis as in the first method. The sales line is also drawn as usual. In this method, the question of intersection of sales line with the total cost line does not arise because there is no cost line.

The break-even point is that point where the contribution line crosses the fixed cost line. At this point, total contribution is equal to the total fixed cost and hence there is no profit or loss. As the contribution increases more than the fixed cost, profit shall arise to the organisation and as contribution decreases from the fixed cost, there shall be loss to the organisation. The contribution break-even chart shows clearly contribution at different levels of activity and indicates that all levels below the break-even point are unable to cover the fixed costs.



In the above example, at level of output/sales of 25,000 units, there is a profit of? 50,000 as indicated by the break-even charts under the three methods.

4.12.1 Assumptions Underlying Break-Even Charts

There are a number of assumptions which are made while drawing a break-even chart, such as:

(i) All costs can be separated into fixed and variable costs.

(ii) Fixed costs remain constant at all levels of activity.

(iii) Variable cost fluctuates directly in proportion to changes in the volume of output.

(iv) Selling prices per unit remain constant at all levels of activity.

(v) There is no opening or closing stock.

(vi) There will be no change in operating efficiency.

(vii) Product mix remains unchanged or there is only one product.

(viii) The volume of output or production is the only factor which influences the cost.

4.12.2 Limitations Of Break-even Charts

Despite many advantages, a break-even chart suffers from the following limitations:

1. A break-even chart is based upon a number of assumptions, discussed above, which may not hold good under all circumstances. For example, fixed costs do not remain constant after a certain level of activity ; variable costs do not always vary in direct proportion to changes in the volume of output because of the laws of diminishing and increasing returns ; selling prices do not remain the same for ever and for all levels of output due to competition and changes in the general price level ; etc.
2. A break-even chart provides only a limited information. We have to draw a number of charts to study the effects of changes in the fixed costs, variable costs and selling prices on the profitability. In such cases, it becomes rather more complicated and difficult to understand.
3. Break-even charts present only cost-volume profit relationships but ignore other important considerations such as the amount of capital investment, marketing problems and government policies, etc.
4. A break-even chart does not suggest any action or remedies to the management as a tool of management decisions.
5. More often, a break-even chart presents only a static view of the problem under consideration.

4.13 Merits and Demerits of Break-even (B.E) Charts

Break-even analysis is a very important and useful tool of financial management and control. The simplicity of these charts is one of their great values.

As they are easy to understand, they constitute a helpful mechanism for showing the top management the problems inherent in cost-volume- profit relationships. They are extremely useful in planning devices.

A) Benefits of Break-Even Chart

The following are the benefits out of break-even analysis:

1. Make or Buy Decision

The C-V-P analysis assists in making a choice between two courses of action to make versus to buy. If the variable cost is less than the price that has to be paid to an outside supplier, it may be better to manufacture than to buy.

2. Production Planning

The C-V-P analysis helps in planning the production of items giving maximum contribution towards profit and fixed costs.

3. Cost Control

As a cost control device, the C-V-P analysis can be used to detect insidious upward creep of costs that might otherwise go unnoticed.

4. Financial Structure

Break-even analysis provides an understanding of the behaviour of profits in relation to output. This understanding is significant in planning the financial structure of a company.

5. Conditions of Uncertainty

When some reasonable basis for subjective extrapolation is available, the break-even analysis provides the financial management with information helpful in its decision-making activities.

B) Disadvantages of Break-Even Charts

1. Break-even charts are constructed assuming that all goods produced by the firms are actually sold- the graph does not show the possibility that stocks may build up if not all goods are sold.
2. Fixed costs only remain constant if the scale of production does not change.
3. Break-even charts concentrate on the break-even level of production,but there are many other aspects of the operations of a business which need to be analysed by managers.
4. The simple charts used in this section have assumed that costs and revenues can br drawn with straight lines. This will not often be case; for example, increasing output to the capacity of a factory may involve paying overtime wage rates to production workers. This will make the variable cost line slope more steeply upwards as output expands. Also, in order to increase sales a business may need to offer discounts for large and this will cause the slope of the revenue line to be less steep.

PROBLEMS

Problem No. 1

X. Co. Ltd. has an overall P/V ratio of 40%. The marginal cost of product 'A' is estimated to be Rs. 30/-. Determine the selling prie for product 'A'.

Solution :

$$\text{P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} = 40\% \text{ (given)}$$

Hence, if selling price is Rs. 100, then contribution is Rs. 40 and variable cost is Rs. 60 (100 – 40). Thus, selling price of a product having variable cost of Rs. 60 is Rs.100. The selling price of a product having a variable cost of Rs. 30/- should be = $\frac{100 \times 30}{60} = 50$

It can also be calculated as :

$$\text{P/V ratio} = \frac{\text{Contribution}}{\text{Sales}}$$

$$\text{or,} \quad 40\% = \frac{\text{Contribution}}{\text{Sales}}$$

$$\text{or,} \quad 40\% = \frac{\text{Sales} - \text{Variable Cost}}{\text{Sales}}$$

$$\text{or,} \quad 40\% = 1 - \frac{\text{Variable Cost}}{\text{Sales}}$$

$$\text{or,} \quad \frac{\text{Variable Cost}}{\text{Sales}} = 100 - 40 = 60\%$$

$$\text{or,} \quad \text{Sales Price} = \frac{\text{Variable Cost}}{60\%}$$

$$= \frac{30}{60\%} = \frac{30}{60} \times 100$$

Hence, Sale Price = Rs. 50.

Problem No. 2

Quantity Products Ltd. manufacturers and markets a single product. The following data are variable :

	Per Unit Rs.
Materials	16
Covnersion cost (variable)	12
Dealer's margin (10% of sale)	4
Selling Price	40
Fixed Cost	Rs. 5 lakhs
Present sales	90,000 units
Capacity utilisation	60%

There is stiff competition. Extra efforts are necesary to sell. Suggestions have been made for increasing sales :

a) By reducing sales price by 5%.

b) By increasing dealers' margin by 25% of the existing rate.

Which of the two suggestions you would recommend if the company desires to maintain the present profit ? Give reasons.

Solution :

			Rs.
Selling Price per unit			40
Less :	Marginal cost, per unit	Rs.	
	Materials	16	
	Conversion Cost	12	
	Dealer's margin (10% of sales)	4	32
Contribution per unit			8
Total contribution on present sales of 80,000 units		90,000 × 8	
		Rs. 7,20,000	
Less : Fixed cost		Rs. 5,00,000	
Present profit		Rs. 2,20,000	

a) Reducing Sales Price by 5%

The new sale price willbe : $40 - \frac{5}{100} \times 40 = 38$

			Rs.
Selling Price, per unit			38
Less :	Marginal cost	Rs.	
	materials	16	
	conversion cost	12	
	Dealers' marginal (10% of sales)	3.80	31.80
	Contribution per unit		6.20

Total No. of Units required to earn the same profit of Rs. 2,20,000

$$= \frac{\text{Fixed Cost + Desired Profit}}{\text{Contribution per unit}}$$

$$= \frac{5,00,000 + 2,20,000}{6.20} = 1.16.129 \text{ units}$$

b) Increasing Dealers margin by 25%

			Rs.
Selling price, per unit			40
Less :	marginal cost	Rs.	
	materials	16	
	conversion cost	12	
	dealers' margin $\left[4 + \left(\frac{25}{100} \times 4\right) = 5\right]$	5	33
Contribution per unit			7

Total no. of units required to earn the same profits of Rs. 2,20,000

$$= \frac{\text{Fixed Cost + Desired Profit}}{\text{Contribution per unit}}$$

$$= \frac{5,00,000 + 2,20,000}{7} = \frac{7,20,000}{7} = 1,02,857 \text{ units.}$$

Suggestion (b) of increasing dealers' margin by 25% is recommended because contribution per unit is higher in this case, i.e., Rs. 7 per unit as compared to Rs. 6.20 per unit in case of suggestion (a) In addition, if suggestion (b) is adopted lower sales efforts will be needed to earn the present profits of Rs. 2,20,000 as compared to when suggestion (a) is adopted.

Problem No. 3

There are two similar factories under the same management. The management desires to merge these two plants. The following particulars are available :

	Factory I	Factory II
Capacity operation	100%	60%
Sales	Rs. 300 Lakhs	Rs. 120 Lakhs.
Variable costs	Rs. 220 Lakhs	Rs. 90 Lakhs
Fixed costs	Rs. 40 Lakhs	Rs. 20 Lakhs

You are required to calculate :

a) What would be the capacity of the merged plant to be operated for the purpose of break-even

b) What would be the profitability on working at 75% of the merged capacity.

Solution :

a) Calculation of the capacity of the merged plant at break-even.

	Factory I (at 100% capacity) Rs. in lakhs	Factory II (at 100% capacity) Rs. in lakhs	Combined (at 100% capacity) Rs. in lakhs
Sales	300	300	500
Less: Variable Cost	220	150	370
Contribution	80	150	130
Fixed Costs	40	20	60

$$\text{Combined P/v Ratio} = \frac{\text{Combined Contribution}}{\text{combined sales}} \times 100$$

$$= \frac{130}{500} \times 100 = 26\%$$

$$\text{Sales at Break-Even Point} = \frac{\text{Combined Fixed Cost}}{\text{Combined P/V Ratio}}$$

$$= \frac{60}{26\%} = \frac{60}{26} \times 100 = 230.8 \text{ lakhs}$$

$$\text{Break-Even Point} = \frac{\text{Break-Even Sales Volume}}{\text{Total capacity sales volume}} \times 100$$

$$= \frac{230.8}{500} \times 100 = 46.16\%$$

Thus, the capacity of the merged plant to be operated for the purpose of break-even would be 46.16%

b) Profitability Statement at 75% of the Merged Capacity

	Rs. in Lakhs
Sales	375.00
Less : Variable cost (100-26%) = 74%	277.50
Contribution	97.50
Less : Fixed costs	60.00
Profit	37.50

Problem No. 4

J.K. Ltd. sold 2,00,000 units of its product at Rs. 35 per unit. Variable costs are Rs.15 (manufacturing costs Rs. 12 and selling cost of Rs. 3 per unit). Fixed costs are incurred uniformly throughout the year and amount of Rs. 30,00,000 (including depreciation of Rs. 10,00,000). There are no beginning or ending inventories.

Required :

i) Estimate break even sales level quantity and cash breakeven sales level quantity.

ii) Estimate the P/V ratio.

iii) Estimate the number of units that must be sold to earn an income (EBIT) of Rs. 2,00,000.

iv) Estimate the sales level in units and value to achieve an after tax income (PAT) of Rs. 3,00,000. Assume 40% corporate income tax rate.

Solution :

i) Break-Even Sales (Units) $= \frac{\text{Fixed cost}}{\text{contribution per unit}}$

$$= \frac{\text{Fixed cost}}{\text{selling price} - \text{variable cost per unit}}$$

$$= \frac{30,00,000}{20} = 1,50,000 \text{ units}$$

$$\text{Cash Break-Even Sales(units)} = \frac{\text{Cash fixed cost}}{\text{contribution per unit}}$$

$$= \frac{20,00,000}{20} = 1,00,000 \text{ units}$$

ii) P/V Ratio $= \frac{\text{Contribution per unit}}{\text{selling price per unit}} \times 100$

$$= \frac{20}{35} \times 100 = 57.142\%$$

iii) Number of units that must be sold to earn EBIT of Rs. 2,00,000

$$\text{Desired Sales (units)} = \frac{\text{Fixed cost + Desired profit}}{\text{contribution per unit}}$$

$$= \frac{30,00,000 + 2,00,000}{20} = 1,60,000 \text{ units}$$

iv) Number of units that must be sold to earn PAT of Rs. 3,00,000

Profit after tax = Rs. 3,00,000

Tax rate = 40%

Profit Before tax = $3,00,000 \times \frac{100}{60}$ = Rs. 5,00,000

Desired Sales (units) = $\frac{\text{Fixed cost + Desired profit}}{\text{Contribution per unit}}$

= $\frac{30,00,000 + 5,00,000}{20}$ = 1,75,000 units

Desired sales (value) = 1,75,000 × 35

= Rs. 61,25,000.

4.14 Advantages of Marginal Costing

Advantages

The technique of marginal costing is of immense value of managerial decisions. In addition it can be significant tool for cost control, profit planning, selection of product mix etc. The following are the main advantages of marginal costing :

1. Simple to operate and easy to understand

Marginal costing is a simple technique. It is very simple to operate and easy to understand. It is constant in nature. Complications involved in allocation, apportionment and absorption of overheads are avoided.

2. Cost Control

In marginal costing costs are divided into fixed and variable costs. Variable costs are always controllable. Thus, greater control may be exercised over these costs. Further, effective control on fixed costs becomes easier by treating them as a whole in the determination of the profit.

3. Helps Management in decision making

This technique helps the management in taking various decisions. Marginal costing is most useful in taking decisions like price fixation, make or buy, introduction of new product line, selection of product mix, etc.

4. Relationship of Net Income with Sales

Marginal costing system establishes direct relationship of net income with the sales. The Marginal contribution technique provides a better and more logical basis for the fixation of sales prices with intending profits.

5. Treatment of overheads simplified

It reduces the degree of over or under recovery of overheads due to the separation of fixed overheads from production cost.

6. Helps in preparing flexible budget

Marginal costing facilitates the preparation of flexible budget by differentiating variable costs and fixed costs. It also helps in the evaluation of the performance of responsible personnel.

7. Stock valuation

In marginal costing inventory is valued at variable cost. Thus, unrealized or fictitious profits are not taken into account. Under this method stock valuation will be uniform and realistic.

8. Aid to Profit Planning

Marginal costing technique provides data relating to cost- volume-profit relationship. This facilitates profit planning in future.

9. Helps in Pricing

Marginal costing is very helpful in fixation of selling price of the products under various conditions. It gives a better and more logical base for the fixation of sales price as well as in tendering for contracts when business is at low level.

10. Cost per unit constant

Marginal costing takes only variable cost into account. Fixed cost which influences the unit cost at various levels of production is ignored. Hence, unit cost remains constant at various levels of production.

11. Helps to know marginal thinking

The form in which the marginal cost information is presented and disseminated closing confirms to the marginal thinking and philosophy.

12. Profitability Appraisal

Marginal costing helps the management in evaluating the profitability of alternate operations.

13. Complementary to standard costing

Marginal costing is complementary to standard costing and budgetary control. It can be used along with standard costing to yield better results.

4.15 Limitations of Marginal Costing

1. Practical difficulty in dividing the cost

The whole concept of marginal costing is based on the classification of total cost into fixed and variable cost which is a very difficult task. In marginal costing semi-variable or semi-fixed cost are not considered.

2. Time factor ignored

Marginal costing technique does not attach much importance to time factor. If time taken for completing two different jobs is not the same, costs will naturally will be higher for the job which has taken longer time. Though marginal cost may be the same for both the jobs.

3. Improper basis of pricing

Marginal costing gives impression that as long as the price is more than the marginal cost production is profitable. But it may result in over all loss. In long run, price without covering total cost will not yield profit to the firm.

4. Not suitable to all industries

Marginal costing technique is not effective in all types of industries. For example in capital intensive industries fixed cost like depreciation is more. If fixed costs are ignored proper results cannot be ascertained. With the increase of automation the scope of marginal costing is decreasing.

5. Fluctuation in profits

Marginal costing technique cannot be applied in industries where there is large stock of work-in-progress. As fixed overheads are not included in the value of stock, firm will get losses in some years. This results in wide fluctuations in profits.

6. Difficulty in the fixation of price

Under marginal costing, selling price is fixed on the basis of contribution. In case of cost plus contract it is very difficult to fix price.

7. Under or over absorption

Application of variable overheads depends on estimate and not on actual as such there may be under or over absorption.

8. Full claim cannot be claimed

Since stock is valued at marginal cost, in case of fire full amount of loss cannot be recovered from the insurance company.

9. Not suitable for external reporting

This technique is not suitable for external reporting viz., for tax authorities, where marginal income is not considered to be taxable profit.

10. Significance Lost

In capital intensive industries fixed costs occupy major portion in the total cost. But marginal costs cover only variable costs. As such, it losses its significance in capital intensive industries.

11. Full information not give

Marginal costing does not explain the reasons for increase in production or sales.

SHORT NOTES

1. Marginal Costing

Marginal costing is very helpful in managerial decision making. Management's production and cost and sales decisions may be easily affected from marginal costing. That is the reason, it is the part of cost control method of cost accounting. Before explaining the application of marginal costing in managerial decision making, we are providing little introduction to those who are new for understanding this important concept.

2. Absorption Costing

Absorption costing also known as 'full costing' is the total cost technique. It is the conventional and most widely used technique of ascertaining cost. According to ICMA, London, defines absorption costing as "the practice of charging all costs both variable and fixed to operations, processes or products."

3. CVP Analysis

Cost-volume-profit (CVP) analysis is a key step in many decisions. CVP analysis involves specifying a model of the relations among the prices of products, the volume or level of activity, unit variable costs, total fixed costs, and the sales mix. This model is used to predict the impact on profits of changes in those parameters.

4. Contribution Margin

Contribution margin is the amount remaining from sales revenue after variable expenses have been deducted. It contributes towards covering fixed costs and then towards profit.

5. Unit Contribution Margin

The unit contribution margin can be used to predict changes in total contribution margin as a result of changes in the unit sales of a product. To do this, the unit contribution margin is simply multiplied by the change in unit sales. Assuming no change in fixed costs, the change in total contribution margin falls directly to the bottom line as a change in profits.

6. Contribution Margin Ratio

The contribution margin (CM) ratio is the ratio of the contribution margin to total sales. It shows how the contribution margin is affected by a given dollar change in total sales. The contribution margin ratio is often easier to work with than the unit contribution margin, particularly when a company has many products. This is because the contribution margin ratio is denominated in sales dollars, which is a convenient way to express activity in multi-product firms.

7. P/V Ratio

The profit / volume ratio, which is also called the 'contribution ratio' or 'marginal ratio', expresses the relation of contribution to sales and can be expressed as under :

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}}$$

Since contribution = Sales – Variable cost = Fixed cost + Profit, P/V ratio can also be expressed as :

$$\text{P/V Ratio} = \frac{\text{Sales} - \text{Variable cost}}{\text{Sales}} \text{ i.e., } \frac{S - V}{S}$$

$$\text{or, P/V Ratio} = \frac{\text{Fixed Cost + Profit}}{\text{Sales}} \text{ i.e., } \frac{F + P}{S}$$

$$\text{or, P/V Ratio} = \frac{\text{Change in profit or Contribution}}{\text{Change in Sales}}$$

8. Significance of P/V Ratio

P/V Ratio indicates rate of profitability associated with growth in sales value. A high P/V ratio suggests that with the increase in Sales, Profits will increase at higher rate, assuming that there is no increase in fixed cost. In such cases, a firm would reap more profits by spending on Advertisements and other sale promotion campaigns to boost sales.

In periods of depression, a high P/V ratio suggests that a producer can reduce his price without incurring much losses.

Given the fixed cost a higher P/V Ratio results in lower BEP and hence lower risk. Low P/V ratio leads to high BEP and high risk.

9. Break-Even Analysis

Break-even analysis is a technique widely used by production management and management accountants. It is based on categorising production costs between those which are "variable" (costs that change when the production output changes) and those that are "fixed" (costs not directly related to the volume of production).

Total variable and fixed costs are compared with sales revenue in order to determine the level of sales volume, sales value or production at which the business makes neither a profit nor a loss (the "break-even point").

10. Break-Even Chart

In its simplest form, the break-even chart is a graphical representation of costs at various levels of activity shown on the same chart as the variation of income (or sales, revenue) with the same variation in activity.

11. Break-even Point

The break-even point may be defined as that point of sales volume at which total revenue is equal to total cost. It is a point of no profit, no loss. A business is said to break-even when its total sales are equal to its total costs. The break-even point refers to that level of output which evenly breaks the costs and revenues and hence the name.

12. Margin of Safety

The excess of actual or budgeted sales over the break-even sales is known as the margin of safety. It is the difference between actual sales minus the sales at break-even point. It represents the amount by which sales revenue can fall before a loss is incurred. As at break-even point there is no profit no loss, sales beyond the break-even point represent margin of safety because any sales above the break-even point will give some profit. Thus,

Margin of Safety = Total Sales – Sales at Break Even Point.

UNIT V

BUDGETING & VARIANCE ANALYSIS

i. Budget, Budgeting & Budgetary control; Objectives, Characteristics & essentials of Budgetary control

ii. Organization of Budgetary control system, budget centre, Budget manual, Budget committee & Budget period

iii. Budgeting Vs Forecasting. Advantages & Limitations of Budgeting

iv. Standard cost & standard costing. Types of Standards, steps involved in Standard Costing

v. Differences between Standard costs and Estimated costs, Similarities differences between Standard Costing and Budgetary Control; Advantages and Limitations of Standard Costing.

5.1 Budget, Budgeting and Budgetary Control

Introduction

One of the primary objectives of management accounting is to provide information to the management for planning and control. Budgeting acts as a tool for both planning and control. Budgeting is a formal process of financial planning using estimated financial and accounting data.

The Institute of Cost and Management Accountants (UK) defines a budget as "a financial and/or quantitative statement, prepared and approved prior to a defined period of time, of the policy to be pursued during that period for the purpose of attaining a given objective. It may include income, expenditure and the employment of capital." The National Association of Accountants (USA) defines budgeting as "the process of planning all flows of financial resources into, within, and from an entity during some specified future period".

5.1.1 Meaning and Definition of a Budget

A budget is the monetary or/and quantitative expression of business plans and policies to be pursued in the future period of time. The term budgeting is used for preparing budgets and other procedures for planning, co-ordination and control of business enterprise.

According to CIMA, Official Terminology, "A budget is a financial and/or quantitative statement prepared prior to a defined period of time, of the policy to be pursued during that period for the purpose of attaining a given objective." In the words of Crown and Howard, "A budget is a pre-determined statement of management policy during a given period which provides a standard for comparison with the results actually achieved."

5.1.2 Meaning of Budgeting

Budgeting is a business process in which senior executives and department heads set spending limits and cost thresholds for each business unit. At the end of each month or quarter, segment managers compare actual data with budget amounts and make adjustments.

5.1.3 Meaning and Definition of Budgetary Control

Budgetary control is the process of determining various budgeted figures for the enterprises for the future period and then comparing the budgeted figures with the actual performance for calculating variances, if any. First of all budgets are prepared and then actual results are recorded. The comparison of budgeted and actual figures will enable the management to find out discrepancies and take remedial measures at a proper time. The budgetary control is a continuous process which helps in planning and co-ordination. It provides a method of control too. A budget is a means and budgetary control is the end-result.

According to Brown and Howard, "Budgetary control is a system of controlling costs which includes the preparation of budgets, co-ordinating the department and establishing responsibilities, comparing actual performance with the budgeted and acting upon results to achieve maximum profitability." Wheldon characterises budgetary control as 'planning in advance of the various functions of a business so that the business as a whole is controlled'.

Budgetary control involves the use of budget and budgetary reports, throughout the period to co-ordinate, evaluate and control day-to-day operations in accordance with the goals specified by the budget.

5.1.4 Budget, Budgeting and Budgetary Control

A **budget** is a blue print of a plan expressed in quantitative terms. **Budgeting** is technique for formulating budgets. **Budgetary control**, on the other hand, refers to the principles, procedures and practices of achieving given objectives through budgets.

Rowland and William have differentiated the three terms as : "Budgets are the individual objectives of a department, etc., whereas Budgeting may be said to be the act of building budgets. Budgetary control embraces all and in addition includes the science of planning the budgets to effect an overall management tool for the business planning and control".

5.1.5 Features / Characteristics of Budgetary Control

An effective budgeting system should have essential features to get best results. In this direction, the following may be considered as essential features of an effective budgeting.

1. Business Policies defined

The top management of an organization strives to have an action plan for every activity and for each department. Every budget should reflect the business policies formulated from time to time. The policies should be precise and the same must be clearly defined. No ambiguity should enter the document. Clear knowledge should be provided to all the personnel concerned who are going to execute the policies. Periodic suggestions should also be taken.

2. Forecasting

Business forecasts are the foundation of budgets. Time and again discussions should be arranged to derive the most profitable combinations of forecasts. Better results can be anticipated based on the sound forecasts. As far as possible, quantitative techniques should be made use of while forecasting.

3. Formation of Budget Committee

A budget committee is a group of representatives of various important departments in an organization. The functions of committee should be specified clearly. The committee plays a vital role in the preparation and execution of budget estimated. It brings coordination among other departments. It aids in the finalization of policies and programs. Non-financial activities are also considered to make it a wholesome affair.

4. Accounting System

To make the budget a successful document, there should be proper flow of accurate and timely information. The accounting adopted by the organization should be proper and must be fine-tuned from time to time.

5. Organizational efficiency

To make the budget preparation and its subsequent implementation a success, an efficient, adequate and best organization is necessary a budgeting system should always be supported by a sound organizational structure. There must be a clear cut demarcation of lines of authority and responsibility. There must also be a delegation of authority from top to bottom line.

6. Management Philosophy

Every management should set a healthy philosophy while opting for the budget. Management must wholeheartedly support the activities which developing a budget. Encouragement should flow from top management. All the members must be involved to make it a workable preposition and a dream-driven document.

7. Reporting system

Proper feedback system should be established. Provision should be made for corrective measures whenever comparative measures are proposed.

8. Availability of statistical information

Since budgets are always prepared and expressed in quantitative terms, it is essential that sufficient and accurate relevant data should be made available to each department.

9. Motivation

Since budget acts as a mirror, the entire organization should become smart in its approach. Every employees both executive and non-executives should be made part of the overall exercise. Employees should be persuaded than pressurized to appreciate the benefits of the budgets so that the fruits can be shared by all the members of the organization.

5.1.6 Objectives of Budgetary Control

The following are the objectives of a budgetary control system:

1. Planning

A budget provides a detailed plan of action for a business over definite period of time. Detailed plans relating to production, sales, raw material requirements, labour needs, advertising and sales promotion performance, research and development activities, capital additions etc., are drawn up. By planning many problems are anticipated long before they arise and solutions can be sought through careful study. Thus most business emergencies can be avoided by planning. In brief, budgeting forces the management to think ahead, to anticipate and prepare for the anticipated conditions.

2. Co-ordination

Budgeting aids managers in co-ordinating their efforts so that objectives of the organisation as a whole harmonise with the objectives of its divisions. Effective planning and organisation contributes a lot in achieving coordination. There should be coordination in the budgets of various departments. For example, the budget of sales should be in coordination with the budget of production. Similarly, production budget should be prepared in co-ordination with the purchase budget, and so on.

3. Communication

A budget is a communication device. The approved budget copies are distributed to all management personnel which provides not only adequate understanding and knowledge of the programmes and policies to be followed but also gives knowledge about the restrictions to be adhered to. It is not the budget itself that facilitates communication, but the vital information is communicated in the act of preparing budgets and participation of all responsible individuals in this act.

4. Motivation

A budget is a useful device for motivating managers to perform in line with the company objectives. If individuals have actively participated in the preparation of budgets, it act as a strong motivating force to achieve the targets.

5. Control

Control is necessary to ensure that plans and objectives as laid down in the budgets are being achieved. Control, as applied to budgeting, is a systematized effort to keep the management informed of whether planned performance is being achieved or not. For this purpose, a comparison is made between plans and actual performance. The difference between the two is reported to the management for taking corrective action.

6. Performance Evaluation

A budget provides a useful means of informing managers how well they are performing in meeting targets they have previously helped to set. In many companies, there is a practice of rewarding employees on the basis of their achieving the budget targets or promotion of a manager may be linked to his budget achievement record.

5.1.7 Requisities for a Successful Budgetary Control System

For making a budgetary control system successful, following requisites are required:

1. Clarifying objectives

The budgets are used to realise objectives of the business. The objectives must be clearly spelt out so that budgets are properly prepared. In the absence of clear goals, the budgets will also be unrealistic.

2. Proper Delegation of Authority and Responsibility

Budget preparation and control is done at every level of management. Even though budgets are finalised at top level but involvement of persons from lower levels of management is essential for their success. This necessitates proper delegation of authority and responsibility.

3. Proper Communication System

An effective system of communication is required for a successful budgetary control. The flow of information regarding budgets should be quick so that these are implemented. The upward communication will help in knowing the difficulties in implementation of budgets. The performance reports of various levels will help top management in budgetary control.

4. Budget Education

The employees should be properly educated about the benefits of budgeting system. They should be educated about their role in the success of this system. Budgetary control may not be taken only as a control device by the employees but it should be used as a tool to improve their efficiency.

5. Participation of All Employees

Budgeting is done for every segment of the business. It will also require the active participation and involvement of all employees. In practice the budgets are to be executed at lower levels of management. Those for whom the budgets are framed should be actively associated with their preparation and execution. The employees, on the basis of their past experience, may give more practical and useful suggestions. The success of budgetary control system depends upon the participation of all employees of the organisation.

6. Flexibility

Flexibility in budgets is required to make them suitable under changed circumstances. Budgets are prepared for the future, which is always uncertain. Even though budgets are prepared by considering the future possibilities but still some occurrences later on may necessitate certain adjustments. Flexibility will make the budgets more appropriate and realistic.

7. Motivation

Budgets are to be implemented by human beings. Their successful implementation will depend upon the interest shown by the employees. All persons should be motivated to improve their working so that budgeting is successful. A proper system of motivation should be introduced for making this system a success.

5.2 Essentials of Budgetary Control

Essentials of effective budgetary control are:

1. Sound Forecasting

The estimates for the future needs of business should be precise and accurate. A scientific forecasting system gives adequate and reliable data for budgeting.

2 Goal Orientation

Budgets must directly flow from objectives of the enterprise, and goals of budgetary control must be clearly defined.

3. Proper Recording System

Sound accounting procedures should be allowed for proper recording of actual operations. Unless the actual performance is accurately recorded and quickly reported; the whole structure of budgeting will fall. Budgeting is greatly helped if there is also the system of standard costing in use.

4. Participation

All individuals responsible for achieving results should be consulted in the formulation of budgets. No system of budgetary control can succeed without the mutual understanding of superiors and subordinates. Participation assures full co-operation and commitment for making budgets successful. Participation also makes budgets realistic and workable.

5. Top Management Support

Since budgeting highlights inefficiencies there is bound to be resistance. This makes it more necessary that top management should believe in the importance of budgetary control. Thus the overall budgets must be set and approved at the chief executive level.

6. Flexibility

Budgets should be flexible. If actual business conditions differ from what was expected, it should be possible to recast the budget quickly.

7. Enforce Timeliness

Budgets must be prepared so as to be ready before the period to which they relate. Moreover sufficient time should be allowed for the budget programme to develop and reach near perfection.

8. Efficient Organization

A good organisation structure is necessary for success in budgeting. There should be fixed responsibility centres, budget committee and budget controller.

9. Proper Co-ordination

The budget plans must be properly co-ordinated in order to eliminate bottlenecks. Individual budgets should be co-ordinated with one another.

10. Sound Administration

Budgets cannot replace good management. Budgets should be administered efficiently by responsible executives.

11. Constant Review

Constant review of the budgets is necessary so as to prevent them from degenerating into license for spending the full budgeted amount even though it may not be necessary.

12. Reward and Punishment

The concerned employees should be suitably rewarded for performance as per the budget. But slack employees should not be allowed to go unpunished.

13. Results Take Time

The budgetary control is an efficient tool to control performance. But it requires time to show results. Those who administer budgetary control should have high degree of knowledge and experience in the field.

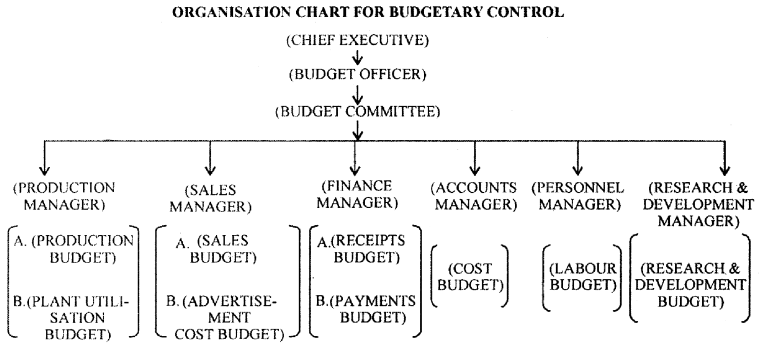
5.3 Organization of Budgetary Control System

In order to introduce budgetary control system, the following are essential to be considered for a sound and efficient organization. The important aspects to be considered are :

1. Organisation Chart
2. Budget Centre
3. Budget Officer
4. Budget Committee
5. Budget Manual
6. Budget Period
7. Key Factor

5.3.1 Organisation Chart / Organisation for Budgetary Control

The proper organisation is essential for the successful preparation, maintenance and administration of budgets. A Budgetary Committee is formed which comprises the departmental heads of various departments. All the functional heads are entrusted with the responsibility of ensuring proper implementation of their respective departmental budgets. An organisation chart for budgetary control is give below :



The Chief Executive is the overall incharge of budgetary system. He constitutes a budget committee for preparing realistic budgets. A budget officer is the convener of the budget committee who co-ordinates the budgets of different departments. The managers of different departments are made responsible for their departmental budgets.

5.3.2 Budget Centre

A budget center is that part of the organization for which the budget is prepared. A budget center may be a department, section of a department, or any other part of the department. Ideally, the head of every center should be a member of the Budget Committee. However, it must be ensured that each budget center at least has an indirect representation in the Budget Committee. The establishment of budget centers is essential for covering all parts of the organization becomes easy when different centers are established. The budget centers are also necessary for cost control purposes.

5.3.3 Budget Officer

The chief executive appoints budget officer. Such budget officer also called as "Budget Controller or Budget Director". His rank should be equal to other functional managers. The Budget officer does not have the direct responsibility of preparing the budgets. The various functional managers prepare the budgets. His role is that of a supervisor. The budget officer has the specific duty of administering the budget. He is responsible for timely completion of budgeting activity by various departments and for co-ordination between them so that there is a proper link between them. He is empowered to scrutinize the budgets prepared" by different functional heads and to make changes in them, if the situation so demands.

The budget officer works as a coordinator among different departments. He continuously monitors the actual performance of different departments. He determines the deviations in the budgets and takes necessary steps to rectify the deficiencies, if any. He also informs the top management about the performance of different departments. The budget officer will be able to can out his work only if he is conversant with the working of all the departments. He must have technical knowledge of the business and should also possess accounting knowledge.

5.3.4 Budget Committee

A budget committee is formed to assist the Budget Officer. The Budget Officer acts as coordinator of this committee. The heads of all the important departments are made members of this committee. The committee is responsible for preparation and execution of budgets. The members of this committee put up the case of their respective departments and help the committee to take collective decisions, if necessary. The budget committee is responsible for reviewing the budgets prepared by various functional heads.

5.3.5 Budget Manual

A budget manual is a document that spells out the duties and responsibilities of the various executives concerned with it specialties among various functional areas, A budget manual covers the following matters:

1. A budget manual clearly defines the objectives of budgetary control system. It also gives the benefits and principles of this system.
2. The duties and responsibilities of various persons dealing with preparation and execution of budgets are also given in a budget manual. It enables the management to know the persons dealing with various aspects to budgets and provides clarity on their duties and responsibilities;
3. It gives information about the sanctioning authorities of various budgets. The financial powers of different managers are given in the manual for enabling the spending amount on various expenses.
4. A proper table for budgets including the sending of performance reports is drawn so that every work starts in time and a systematic control is exercised.
5. The specimen forms and number of copies to be used for preparing budget reports is also stated. Budget centers involved should be clearly stated.

6. The length of various budget periods and control points is clearly given.
7. The problem to be followed in the entire system is clearly stated.
8. A method of accounting to be used for various expenditures is also staled in the manual.

5.3.6 Budget Period

A budget is always related to specified time period. The budget period is the length of time for which a budget is prepared and employed. The period may depend upon the type of budget. There is no specific period as such. However, for the sake of convenience, the budget period may be fixed depending upon the following factors.

(a) Types of Business
(b) Types of Budget
(c) Nature of the demand of the product
(d) Length of trade cycle
(e) Economic factors
(f) Availability of accounting period
(g) Availability of finance
(h) Control operation

5.3.7 Key Factor

Key Factor is also called as "Limiting Factor" or Governing Factor. While preparing the budget it is necessary to consider the key factor for successful budgetary control. The influence of the Key Factor which dominates the business operations in order to ensure that the functional budgets are reasonably capable of fulfillment. The key factors include.

(a) Raw materials may be in short supply.
(b) Non-availability of skilled labours.
(c) Government restrictions.
(d) Limited sales due to insufficient sales promotion.
(e) Shortage of power.

(f) Underutilization of plant capacity.
(g) Shortage of efficient executive.
(h) Management policies regarding lack of capital.
(i) Insufficient research into new product development.
(j) Insufficiency due to shortage of space.

5.4 Budgeting Vs. Forecasting

Sometimes the terms 'budgeting' and 'forecasting' are used interchangeably. Both terms have some similarities. For example, both relate to future events and involve prediction of something. The basic difference between budgeting and forecasting lies in degree of sophistication involved in the predictions used by them. According to the National Association of Accountants (USA), *"forecasting is a process of predicting or estimating a future happening"*.

Forecasting is an essential part of the budgeting process. It pertains to estimating future events and their effects on the budget. It comes to an end after mere estimating. Budgeting is a process of preparing estimates and further control aspects are involved in its procedure. Besides, forecasting can be made by a business for purposes other than budgeting, such as a forecast of general business conditions. Such forecasts are sometimes not used in budgeting.

Forecasting may be needed for future planning or budgeting but it cannot be confused with the later. Forecasts are only will-educated guesses or inferences as to what the future may be. The management has to make predictions while preparing plans for the future.

According to Henry Fayol, father of modern management, the entire plan is made up of series of separate plans called forecasts. Forecasting provides a logical basis for preparing the plans/budgets. The actual performance of the past, the present situation and likely trends in the future are considered while preparing budgets. A budget is the monetary or/and quantitative expression of business plans and policies to be pursued in the future period of time.

The difference between budgeting and forecasting can be summarised as below:

1. Forecasts are merely well-educated estimates or inferences about the future probable events whereas a budget relates to planned events and is the quantitative expression of business plans and policies to be pursued in the future.
2. Budgeting begins where forecasting ends. In fact, forecasting provides the logical basis for preparing the budgets.
3. A budget provides a standard for comparison with the results actually achieved and, thus, is an important control device for the management, while a forecast represents merely a probable event over which no control can be exercised.

5.5 Advantages of Budgetary Control

The budgetary control system helps in fixing the goals for the organisation as a whole and concerted efforts are made for its achievements. It enables economies in the enterprise. Some of the advantages of budgetary control are :

1. Maximisation of Profit

The budgetary control aims at the maximisation of profits of the enterprise. To achieve this aim, a proper planning and co-ordination of different functions is undertaken. There is a proper control over various capital and revenue expenditures. The resources are put to the best possible use.

2. Co-rodination

The working of different departments and sectors is properly co-ordinated. The budgets of different departments have a bearing on one another. The co-ordination of various executives and suboridnates is necessary for achieving budgeted targets.

3. Specific Aims

The plans, policies and goals are decided by the top management. All efforts are put together to reach the common goal of the organisation. Every department is given a target to be achieved. The efforts are directed towards achieving some specific aims. If there is no definite aim then the efforts will be wasted in pursuing different aims.

4. Tool for Measuring Performance

By providing targets to various department, budgetary control provides a tool for measuring managerial performance. The budgeted targets are compared to actual results and deviations are determined. The performance of each department is reported to the top management. This system enables the introduction of management by exception.

5. Economy

The planning of expenditure will be systematic and there will be economy in spending. The finances will be put to optimum use. The benefits derived for the concern will ultimately extend to industry and then to national economy. The national resources will be used economically and wastage will be eliminated.

6. Determining Weaknesses

The deviations in budgeted and actual performance will enable the determination of weak sports. Efforts are concentrated on those aspects where performance is less than the stipulated.

7. Corrective Action

The management will be able to take corrective measures whenever there is a discrepancy in performance. The deviations will be regularly reported so that necessary action is taken at the earliest. In the absence of a budgetary control system the deviations can be determined only at the end of the financial period.

8. Consciousness

It creates budget consciousness among the employees. By fixing targets for the employees, they are made conscious of their responsibility. Everybody knows what he is expected to do and he continues with his work uninterrupted.

9. Reduces Costs

In the present day competitive world budgetary control has a significant role to play. Every businessman tries to reduce the cost of production for increasing sales. He tries to have those combinations of products where profitability is more.

10. Introduction of Incentive Schemes

Budgetary control system also enables the introduction of incentive schemes of remuneration. The comparison of budgeted and actual performance will enable the use of such schemes.

5.6 Limitations of Budgetary Control

Despite many good points of budgetary control there are some limitations of this system. Some of the limitations are discussed as follows :

1. Uncertain Future

The budgets are prepared for the future period. Despite best estimates made for the future, the predictions may not always come true. The future is always uncertain and the situation which is presumed to prevail in future may change. The change in future conditions upsets the budgets which have to be prepared on the basis of certain assumptions. The future uncertainties reduce the utility of budgetary control system.

2. Budgetary Revisions Required

Budgets are prepared on the assumptions that certain conditions will prevail. Because of future uncertainties, assumed conditions may not prevail necessitating the revision of budgetary targets. The frequent revision of targets will reduce the value of budgets and revisions involve huge expenditures too.

3. Discourages Efficient Persons

Under budgetary control system the targets are given to every person in the organisation. The common tendency of people is to achieve the targets only. There may be some efficient persons who can exceed the targets but they will also feel contented by reaching the targets. So budgets may serve as constraints on managerial initiatives.

4. Problem of Co-ordination

The success of budgetary control depends upon the co-ordination among different departments. The performance of one department affects the results of other departments. To overcome the problem of co-ordination a Budgetary Officer is needed. Every concern cannot afford to appoint a Budgetary Officer. The lack of co-ordination among different departments results in poor performance.

5. Conflict among Different Departments

Budgetary control may lead to conflicts among functional departments. Every departmental head worries for his department goals without thinking of business goal. Every department tries to get maximum allocations of funds and this raises a conflict among different departments.

6. Depends upon Support of Top Management

Budgetary control system depends upon the support of top management. The management should be enthusiastic for the success of this system and should give full support for it. If at any time there is a lack of support from top management then this system will collapse.

5.7 Classification / Types of Budget

A) Classification According to Time

1. **Long Term Budgets :** The budgets are prepared to depict long term planning of the business. The period of long term budgets varies between five to ten years. The long term planning is done by the top level management; It is not generally known to lower levels of management. Long time budgets are prepared for some sectors of the concern such as capital expenditure, research and development, long term finances, etc. These budgets are useful for those industries where gestation period is long *i.e.*, machinery, electricity, engineering, etc.
2. **Short-term Budgets :** These budgets are generally for one or two years and are in the form of monetary terms. The consumers goods industries like sugar, cotton, textile, etc. use short-term budgets.
3. **Current Budgets :** The period of current budgets is generally of months and weeks. These budgets relate to the current activities of the business. According to I.C.W.A. London, "Current budget is a budget which is established for use over a short period of time and is related to current conditions".

B) Classification on the Basis of Functions

1. Sales Budget

These should be analyzed as between products, periods and areas. By reference to the trends disclosed by the past figures and with the aid of information supplied by the sales department forecast of anticipated sales for the forthcoming period can be made. The sales forecast or sales budget is the basic core budget on which other budget depend. As such rational efforts should be made to develop a proper sales budget which can be reasonably accomplished.

Preparation of Sales Budget: It has already been started that sales budget is prepared by the sales manager. He is therefore, to consider the following matters at the time of its preparation:

(i) Analysis of Historical Sales: Analysis of past sales, with the help of statistical measurements, cyclical trends seasonal fluctuations etc

(ii) Reports By Salesman: Salesmen also can submit a report to the sales manager which is highly significant since thery are in frequent contact with customer having an internal knowledge about the habits tastes and demand of customers.

(iii) Business Conditions: The general business condition can also be studied from the national as well as international economic statistics, political influences etc

(iv) Market Analysis: Market analysis may be employed by the large firms where's specialists are employed by the small firms for collecting necessary information about the market demand products-design fashion trends, degree of competition etc.

(v) Special Condition: There are certain events which may influence sales outside the firm e.g. introduction of electricity to a village will increase the demand for electrical appliance.

2. Production Budget

Production budget is prepared after the preparation of sales budget, to determine quality of goods which should be produced to meet the budget sales .It is expressed in physical terms, such as

(a) Union of output

(b) Labour of house

(c) Material requirement.

3. Raw Material Budget

This budget reveals the quantities of materials which are needed to make the budget production. It also shows the anticipated cost of materials to be purchased, terms of credit from suppliers, the time taken to procure raw materials etc.

4. Direct Labour Budget

The direct labour budget tells about the estimates of direct labour requirements essential for carrying out the budgeted output. The direct labor cost is estimated as a results of the evaluation of standard hours worked or the quantity of work done by the individual worker in terms of certain average wage rate. This wage rate may be different for each department.

5. Manufacturing Overhead Budget

Manufacturing overhead include the cost of indirect labour indirect expenses. The manufacturing overhead can be classified into three categories

(i) Fixed i.e. which tend to remain constant irrespective of any change in the volume of output.

(ii) Variable i.e. which tend to vary with the output

(iii) Semi-variable i.e. which are party variable and party fixed.

6. Selling And Distribution Overhead Budget

The selling expenses include all items of expenditure on the promotion, maintenance and distribution of finished goods, salaries. depreciation and miscellaneous expenses are provided for as a fixed amount per month.

7. Cash Budget

The cash budget is a summary of the firms expected cash inflows and outflows over a particular period of time .In other word, cash budget involves of a projection of future cash receipts and cash disbursements over various time intervals. There must be a balance between cash and the cash demanding activities.

8. The Master budget

The institute of cost and management accountings England, defines it as the Summery Budget, incorporating its component functional budgets, which is finally approved, adopted and employed. In other words, it is a summery budget which is prepared from and summarizes all the functional budget.

9. Performance Budget

Among the methods which relate costs to outputs, performance budgeting stands out the most prominent. It has emerged as a whole new way of considering fiscal responsibility.

10. Zero-Base Budgeting (ZBB)

The ZBB take account consequences that may flow if the project or responsibility centre is scratched. In other words, the objective of ZBB is to formulate the budget so as to estimate the amount of expenditure likely to be incurred if the existing project resumes operation after being scratched. This method is called Zero Base budgeting since the existing system is discontinued and a fresh is made or the existing system is reviewed on the assumption of Zero-Base.

C) Classification on the Basis of Flexibility

1. Fixed Budgets

It is a budget in which targets are rigidly fixed. Accord ting to I.C.M.A. London. Fixed budget is a budget which to remain in changed irrespective of the level of activity actually attained. Such budgets are usually prepared from one to three months in advance of the fiscal year to which they are applicable.

2. Flexible Budget

Fixed budget is generally rigid as it is based on one level of activity and one set of condition and hence not quite helpful for control purpose. A flexible budget is therefore, designed to provide information as to sales, expenses and profits for different levels of activity which may be obtained.

5.8 Some Important Budgets

5.8.1 Sales Budget

Sales budget is the most important budget and of primary importance. It forms the basis on which all the other budgets are built up. This budget is a forecast of quantities and values of sales to be achieved in a budget period. Every effort should be made to ensure that its figure is as accurate as possible because this is usually the starting budget.

Problem

A manufacturing company submits the following figures of product "X' for the first quarter of 2010 :

Sales (in units)	January	50,000	Target of 1st Quarter 2011
	February	40,000	Sales quantity increase 20%
	March	60,000	Sales price increase 10%

Selling price per unit 100

Prepare Sales Budget for the first quarter of 2011.

Solution :

SALES BUDGET

for the first quarter of 2011

Month	Units	Price per unit Rs.	Value Rs.
January	60,000	110	66,00,000
February	48,000	110	52,80,000
March	72,000	110	79,20,000
	1,80,000		1,98,00,000

5.8.2 Production Budget

Production budget is a forecast of the total output of the whole organisation broken down into estimates of output of each type of product with a scheduling of operations to be performed and a forecast of the closing finished stock. This budget may be expressed in quantitative or financial units or both. This budget is prepared after taking it into consideration the estimate opening stock, the estimated sales and the desired closing finished stock of each product.

Proforma of Production Budget

Particulars	January	February	March	April	June
No. of units sold	xxx	xxx	xxx	xxx	xxx
Add : Closing Stock	xxx	xxx	xxx	xxx	xxx
	xxx	xxx	xxx	xxx	xxx
Less: Opening Stock	xxx	xxx	xxx	xxx	xxx
No. of units produced	xxx	xxx	xxx	xxx	xxx

Problem No. 2

A Company plans to sell 108000 units of a certain products in first quarter.

120,000 units in second Quarters

132,000 units in Third Quarter

156,000 units in Fourth Quarter

138,000 units in Fifth Quarter

At the beginning of the first Quarter of the Current year. There are 18,000 units in the stock. At the end of each Quarter, the company plans to have an Inventory equal to 1/6 of the sale for the next Quarter. How many units must we manufactured in each Quarter of the current year.

Solution :

Production in units = Estimated sales in units + Closing stock in units – opening stock in units.

PRODUCTION BUDGET

Particulars	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Estimated Sales	1,08,000	1,20,000	1,32,000	1,56,000
ADD : Closing stock	20,000	22,000	26,000	23,000
	1,28,000	1,42,000	1,58,000	1,79,000
LESS : Opening stock	18,000	20,000	22,000	26,000
Production in units	**1,10,000**	**1,22,000**	**1,36,000**	**1,53,000**

Working Notes

1. Calculating closing stock in units

First Quarter = 120,000 × $\frac{1}{6}$ = 20,000

Second Quarter = 132,000 × $\frac{1}{6}$ = 22,000

Third Quarter = 156,000 × $\frac{1}{6}$ = 26,000

Fourth Quarter = 138,000 × $\frac{1}{6}$ = 23,000.

5.8.3 Manufacturing (or Production) Overheads Budget

This budget gives an estimate of the works overhead expenses to be incurred in a budget period to achieve the production target. The budget includes the cost of indirect materials, indirect labour and indirect works expenses. The budget may be classified into fixed cost, variable cost and semi-variable cost. It can be broken into departmental overhead budget to facilitate control. In preparing the budget, fixed works overhead can be estimated on the basis of past information after taking into consideration the expected changes which may occur during the budget period. Variable expenses are estimated on the basis of the budgeted output because these expenses are bound to change with the change in output.

The Cost Accountant prepares this budget on the basis of figures available in the manufacturing overhead ledger or the head of the workshop may be asked to give estimates for the manufacturing expenses. A good method is to combine the estimates of the Cost Accountant and the shop executive.

Problem

Prepare a manufacturing overhead budget and ascertain the manufacturing overhead rates at 50% and 70% capacities. Following particulars are given at 60% capacity:

	Rs.
Variable overheads :	
Indirect Material	6,000
Indirect Labour	18,000

Semi-variable overheads :	
Electricity (40% fixed)	30,000
Repairs and Maintenance (20% variable)	3,000
Fixed overheads :	
Depreciation	16,500
Insurance	4,500
Salaries	15,000
Total overheads	93,000
Estimated direct labour hours	1,86,000 hrs.

Solution :

Manufacturing Overhead Budget and Ascertainment of Overhead Rates

Items	50% Capacity	60% Capacity	70% Capacity
Variable overheads :	Rs.	Rs.	Rs.
Indirect Material	5,000	6,000	7,000
Indirect Labour	15,000	18,000	21,000
Semi-variable overheads :			
Electricity	(1) 27,000	30,000	(1) 33,000
Repairs and Maintenance	(2) 2,900	3,000	(2) 3,100
Fixed overheads :			
Depreciation	16,500	16,500	16,500
Insurance	4,500	4,500	4,500
Salaries	15,000	15,000	15,000
Total overheads(a)	85,900	93,000	1,00,100
Estimated direct labour hours (b)	1,55,000	1,86,000	2,17,100
Overhead Rate [(a) ÷ (b)]	Rs. 0.55	Rs. 0.50	Rs. 0.46

Note :

1. **Electricity :** At 60% electricity cost is Rs. 30,000 of which Rs. 12,000 (i.e., 40% of Rs. 30,000) is fixed and Rs. 18,000 variable. The variable portion of the

electricity cost is Rs. 15,000 $\left(\text{i.e., } \frac{\text{Rs. } 18{,}000}{60} \times 50\right)$ at 50% capacity and Rs. 21,000 $\left(\text{i.e., } \frac{\text{Rs. } 18{,}000}{60} \times 70\right)$ at 70% capacity. To this variable portion, the fixed portion of Rs. 12,000 should be added to get the electricity cost.

2. **Repairs and Maintenance :** At 60% capacity, repairs and maintenance cost is Rs. 3,000 of which Rs. 2,400 (i.e., 80% of Rs. 3,000) is fixed and Rs. 600 (i.e., 20% of Rs. 3,000) is variable. The variable portion at 50% is Rs. 500 $\left(\text{i.e., } \frac{\text{Rs. } 600}{600} \times 50\right)$ and Rs. 700 $\left(\text{i.e., } \frac{\text{Rs. } 600}{600} \times 70\right)$ at 70% capacity. To this variable, the fixed portion of Rs. 2,400 should be added to obtain the repairs and maintenance cost. Thus, total cost of repairs and maintenance comes to Rs. 2,900 (i.e., Rs. 500 + 2,400) at 50% and Rs. 3,100 (i.e., Rs. 700 + Rs. 2,400) at 70%.

5.8.4 Cash Budget

This budget gives an estimate of the anticipated receipts and payments of cash during the budget period. Therefore, this budget is divided into two parts, one showing the estimated cash receipts on account of cash sales, credit collections and miscellaneous receipts and the other showing the estimated disbursement on account of cash purchases, amount payable to creditors, wages payable to workers, indirect expenses payable, income tax payable, dividend payable, budgeted capital expenditure etc. In short, every factor which affects the receipts and payments of cash is taken into account in the preparation of this budget.

Problem

From the following estimation of Income and expenditure account prepare a cash Budget for the 3 months beginning from 1st June, when the Bank Balance was Rs 100,000.

Month	Sales in Rs.	Purchase	wages	Factory exp	Administration
April	80, 000	41,000	5,600	3,900	10,000
May	76,500	40,500	5,400	4,200	14000
June	78,500	38,500	5,400	5,100	15,000
July	90,000	37,000	4,800	5,100	17,000
July	90,000	37,000	4,800	5,100	17,000
August	95,000	35,000	4,700	6,000	13,000

A sales commission of 5% on sales due 2 months after sales, is payable in addition to selling expenses plant valued at Rs 65000 will be purchased and paid in August and the dividends for the financial year Rs.15000 will be purchased and paid in August and the dividend for last financial year Rs. 15000 will be paid in July. There is 2 month credit period allowed to customers and received from suppliers. Wages, factory expenses. and Administration selling Expenses are paid in the following month.

Cash Budget for the ending 31st August

Particulars	JUNE	JULY	AUGUST
Opening Balance	1,00,000	1,11,400	1,03,075
ADD CASH RECEIPTS			
Collection from debtors (2 month credit)	80,000	76,500	78,500
Total of A →	1,80,000	1,87,900	1,81,575
Less: CASH PAYMENTS			
Cash paid to creditor (2 months)	41,000	40,500	38,500
Wages (1 month lag)	5,400	5,400	4,800
Factory exp (1 month)	4,200	5,100	5,100
Administration expenses	14,000	15,000	17,000
Commission	$\left(80,000\times\frac{5}{100}\right)$ 4,000	$\left(76,500\times\frac{5}{100}\right)$ 3,825	$\left(78,500\times\frac{5}{100}\right)$ 3,925
Plant	NIL	NIL	65,000
Dividend	NIL	15,000	NIL
Total of B	68,600	84,825	1,34,325
Closing Balance (A-B)	**1,11,400**	**103,075**	**47,250**

5.8.5 Flexible Budget

A flexible budget, or "flex" budget, incorporates different expense levels into the budget, depending upon changes in the amount of actual revenue generated. This approach varies from the more common static budget, which contains nothing but fixed expense amounts that do not vary with actual revenue levels.

Problem

The expenses for budgeted production of 10,000 units in a factory are furnished below:

	Per Unit (Rs.)
Materials	70
Labour	25
Variable Overhead	20
Fixed Overheads (Rs. 1,00,000)	20
Variable Expenses (Direct)	10
Selling Expenses (10% Fixed)	5
Distribution Expenses (20 % Fixed)	13
Administration Expenses (Rs. 50,000)	7
Total Cost Per Unit (To make and sell)	5
Prepare a budget for production of :	155

(a) 8,000 units (b) 6,000 units and (c) indicate cost per unit at both the levels. Assume that administration expenses are fixed for all levels of production.

Solution :

FLEXIBLE BUDGET

Particulars	10,000 units		8,000 units		6,000 units	
	Per unit (Rs.)	Amount (Rs.)	Per unit (Rs.)	Amount (Rs.)	Per unit (Rs.)	Amount (Rs.)
Production Expenses :						
Materials	70	7,00,000	70	5,60,000	70	4,20,000
Labour	25	2,50,000	25	2,00,000	25	1,50,000
Overheads	20	2,00,000	20	1,60,000	20	1,20,000
Direct Variable Expenses	5	50,000	5	40,000	5	30,000
Fixed Overheads.						
(Rs. 1,00,000)	10	1,00,000	12.50	1,00,000	16.67	1,00,000

Selling Expenses :						
Fixed	1.30	13,000	1.63	13,000	2.17	13,000
Variable	11.70	1,17,000	11.70	93,600	11.70	70,200
Distribution Expenses :						
Fixed	1.40	14,000	1.75	14,000	2.34	14,000
Variable	5.60	56,000	5.60	44,800	5.60	33,600
Administration Expenses :	5.00	50,000	6.25	50,000	8.35	50,000
Total Cost to make and sell	155	15,50,000	189,42	12,75,400	166.80	10,00,800

5.9 STANDARD COSTING

Standard costing is an important subtopic of cost accounting. Standard costs are usually associated with a manufacturing company's costs of direct material, direct labour, and manufacturing overhead.

Rather than assigning the actual costs of direct material, direct labour, and manufacturing overhead to a product, many manufacturers assign the expected or standard cost. This means that a manufacturer's inventories and cost of goods sold will begin with amounts reflecting the standard costs, not the actual costs, of a product. Manufacturers, of course, still have to pay the actual costs. As a result there are almost always differences between the actual costs and the standard costs, and those differences are known as variances.

Standard costing and the related variances is a valuable management tool. If a variance arises, management becomes aware that manufacturing costs have differed from the standard (planned, expected) costs.

- If actual costs are greater than standard costs the variance is unfavorable. An unfavorable variance tells management that if everything else stays constant the company's actual profit will be less than planned.
- If actual costs are less than standard costs the variance is favorable. A favorable variance tells management that if everything else stays constant the actual profit will likely exceed the planned profit.

The sooner that the accounting system reports a variance, the sooner that management can direct its attention to the difference from the planned amounts.

5.9.1 Meaning of Standard Cost and Standard Costing

The word 'standard' means a bench-mark or yardstick. The standard cost is a predetermined cost which determines in advance what each product or service should cost under given circumstances. In the words of Backer and Jacobsen, "Standard cost is the amount the firm thinks a product or the operation of a process for a period of time should cost, based upon certain assumed conditions of efficiency, economic conditions and other factors."

The technique of using standard costs for the purposes of cost control is known as standard costing. In the words of Brown and Howard, standard costing may be defined as "a technique of cost accounting which compares the standard cost of each product or service with actual cost to determine the efficiency of the operation so that any remedial action may be taken immediately."

The terminology of Cost Accountancy defines standard costing as "The preparation and use of standard costs, their comparison with actual costs, and the analysis of variance to their causes, and points of incidence". The standard costing has been defined by the London Institute of Cost and Works Accountants as "An estimate cost, prepared in advance of production or supply correlating a technical specification of material, and labour to the price and wage rates estimated for a selected period of time, with an addition of the apportionment of overheads expenses estimated for the same period within a prescribed set of working conditions."

Standard costing is a system of cost accounting which is designed to find out how much should be the cost of a product under the existing conditions. The actual cost can be ascertained only when production is undertaken. The pre-determined cost is compared to the actual cost and a variance between the two enables the management to take necessary corrective measures.

5.10 TYPES OF STANDARDS

The standards are classified into three categories :

(i) Current Standard
  (a) Ideal Standard
  (b) Expected Standard

(ii) Basic Standard

(iii) Normal Standard

(i) Current Standard

A current standard is a standard which is established for use over a short period of time and is related to current condition. It reflects the performance which should be attained during the current period. The period for current standard is normally one year. It is presumed that conditions of production will remain unchanged. In case there is any change in price or manufacturing condition, the standards are also revised. Current standard may be ideal standard and expected standard.

(a) Ideal Standard

This is the standard which represents a high level of efficiency. Ideal Standard is fixed on the assumption that favourable conditions will prevail and management will be at its best. The price paid for materials will be lowest and wastages, etc. will be minimum possible. The labour time for making the production will be minimum and rates of wages will also be low. The overheads expenses are also set with maximum efficiency in mind. All these conditions, both internal and external, should be favourable and only then ideal standard will be achieved.

Ideal standard is fixed on the assumption of those conditions which may rarely exist. This standard is not practicable and may not be achieved. Though, this standard may not be achieved even then an effort is made to reach this standard. The deviation between targets and actual performance are ignorable. In practice, ideal standard has an adverse effect on the employees. They do not try to reach the standard because the standards are not considered realistic. Unfavouable variances in performance have a dampening effect on the morale of employees.

(b) Expected Standard

This standard is based on expected conditions. It is the target which can be achieved if expected conditions prevail. According to J. Batty, "The target set represents what should be achieved under actual condition, when plant and other facilities have been made as efficient as possible". All existing facilities are taken into consideration and expected changes are also taken into account while fixing the expected standard. An allowance is given for human error and normal deficiencies. Expected standard is realistic and

attainable, it is this standard which can be used for fixing efficiency standard. The variance between the budgeted targets and actual performance gives an idea about the efficiency or inefficiency of different individuals. The standard can be used for cost control purposes too. The main drawback of expected standard is that it requires constant revision. As the conditions change, so should the standard, otherwise the standard will be meaningless.

(ii) Basic Standard

A basic standard may be defined as a standard which is established for use for an indefinite period which may be a long period. Basic standard is established for a long period and is not adjusted to the present conditions. The same standard remains in force for a long period. These standards are revised only on the changes in specification of material and technology production. It is just like an index number against which subsequent price changes can be measured. Basic standard enables the measurement of changes in costs. For example, if the basic cost for material is Rs. 20 per unit and the current price is Rs. 25 per unit ; it will show an increase of 25% in the cost of materials. The changes in manufacturing costs can be measured by taking basic standard as a base.

Basic standard cannot serve as a tool for cost control purpose because the standard is not revised for a long time. The deviation between standard cost and actual cost cannot be used as a yardstick for measuring efficiency.

(iii) Normal Standard

As per terminology, normal standard has been defined as, a standard which it is anticipated can be attained over a future period of time, preferably long enough to cover one trade cycle. This standard is based on the conditions which will cover a future period, say 5 years, concerning one trade cycle. If a normal cycle of ups and downs in sales and production is 10 years then standard will be set on average sales and production which will cover all the years. The standard attempts to cover variance in production from one time to another time. An average is taken from the periods of recession and depression. The 'normal standard' concept is theoretical and cannot be used for cost control purposes. Normal standard can be properly applied for absorption of overhead cost over a long period of time.

5.11 Steps Involved in Standard Costing

The technique of standard costing involves the determination of cost before hand. The cost is based on technical information after considering the impact of current conditions. Cost ascertainment is not based on a guess work. The impact of possible factors on cost is studied before setting the standards. The standards are set as per existing conditions of work. With the change in condition, the standard cost too can be modified so as to make it more realistic.

The standards may be divided according to the elements of costs. The standard cost is divided into standards for materials, labour and overheads. The sub-division of standards will be more useful for cost control purposes. The actual cost is recorded when incurred. The standard cost is compared to the actual cost. The difference between the two costs is known as variance. The variances are calculated element-wise. The management can take corrective measures to set the things right.

From the above discussion it is clear that standard costing involves the following steps :

1. The determination of standard cost.
2. The recording of actual cost.
3. The comparison between standard cost and actual cost.
4. The finding out of variance.
5. The reporting of variance so as to find out inefficiency and take necessary corrective measures.

The technique of standard costing is complementary to the ordinary costing system. The standard costs will be of no use if they are not compared with actual costs. The basic purpose of standard costing is to determine efficiency or inefficiency in manufacturing a particular product. This will be possible only if both standard costs and actual costs are given side by side. Though standard costing system will be useful for all types of commercial and industrial undertakings but it will be more useful in those undertakings where production is standardised. It will be of less use in job costing system because every job has different specifications and it will be difficult to determine standard costs.

5.12 Differences Between Standard Costs and Estimated Costs

Estimated Costing	Standard Costing
1. Estimated cost can be used in any business which is running under historical costing system	1. Standard cost can be applied in a business under standard costing system.
2. Compilation of estimated cost may be made at any time for any specific purpose. The costs may reflect approximations or less accuracy. It doesn't matter much.	2 Calculation on scientific basic are to be made for arriving at standard costs
3. The use of estimated costs is as statistical data only	3. Standard costs are used as a regular system of accounts form which variances are found out.
4. The primary emphasis under estimation is on the ascertainment of costs and such cost depends on expected actual or average of past performance.	4. The cost control is the main aspect involved under this system. Standard costs serve as yardsticks for measurement of performance
5. Estimated costs can be ascertained for a particular purpose.	5. Standard costs are to be fixed in respect of every element of cost and therefore, it incorporates whole of the manufacturing process.

5.13 Differences Between Standard Costing and Budgetary Control

Budgetary control is another important technique of cost control. In budgetary control, budgets are used as a means of planning and control. The targets of various segments are set in advance and actual performance is compared with pre-determined objects. In this way management can assess the performance of different departments. On the other hand standard costing also sets standards and enables to determine efficiency on the basis of standards set and actual performance.

The question arises as to whether both the systems are used to serve the same purpose. If both standard costing and budgetary control serve the same purpose, then which one should be used. There are two opinions about the use of these systems. One opinion is that budgetary control is essential to determine standard costs. The other opinion is that standard costing system is necessary for planning budgets.

In fact, the systems operate in two different fields and both are complimentary in nature. The question is whether a concern can afford to use both the methods at the same time or not. If it is possible then both systems will be beneficial in planning and controlling costs and expenditures. Both are similar in their nature and in determining the results. Besides similarities standards costing and budgetary control have points of difference too. The points of distinction between the two systems are discussed as follows :

1. Concept

In budgetary control the budgets are prepared for the concern as a whole whereas in standard costing the standards are set for producing a product or for providing a service. In standard costing, unit concept is used while in budgetary control total concept is used. The whole concern is taken as one unit for budgets. The actual figures for the whole concern are compared with the predetermined budgeted figures. In the case of Government, the budgets are fixed for the whole country or the whole state. The standard cost is fixed for one product and different standards are used for different products.

2. Basis

The budgets are fixed on the basis of past records and future expectations. Standard costs are fixed on the basis of technical information. Standard costs are planned costs and these are expected in future.

3. Scope

The scope of budgetary control is much wider than the scope of standard costing. Budgets are prepared for incomes, expenditures and other activities, etc. Budgets are prepared for different functional departments such as purchase, sale, production, finance and personnel department. One budget known as Master Budget is prepared for the whole concern. On the other hand standards are set up for expenditures only and, therefore, for manufacturing departments standards are set for different elements of cost i.e., material, labour and overheads.

4. Emphasis

In budgetary control, the targets of expenditure are set and these targets cannot be exceeded. In this system the emphasis is on keeping the expenditures within the budgeted figures. In standard costing the standards are set and an attempt is made to achieve these standards. The emphasis is on achieving the standards. Actual costs may be more than the standard costs and there can be no such thing in budgetary control.

5. Objective

Budgets are set on the basis of present level of efficiency while standard costs are based on the basis of standards set by the management. The standards are related to what management wants to achieve.

6. Relationship

Budgetary Control is related to financial accounts while standard costing is related to the cost accounts.

7. Use

Budgets are used for forecasting purposes. The forecasts about incomes, expenditures and costs are based on historical figures and expected changes in future. Standard costing control be used for forecasting purposes.

8. Variance Analysis

Budgetary control deals with total variances only. The variances may be calculated for different departments or for the concern as a whole. In standard costing variances are calculated for different elements of cost, i.e., material, labour and overheads. In standard costing variances are studied according to their causes. An independent study is possible for determining the causes of variances and it will be very helpful for cost control purposes.

9. Elements

The budgetary control system can be applied partly or wholly. Budgets may be prepared for some departments and may not be prepared for all the departments. If a concern is interested in preparing production budget only, it is free to do so. Standard costing cannot be used partially, it will have to be used wholly. The standards will have to be set for all elements of cost.

5.14 Advantages of Standard Costing

- **Measuring efficiency :** Standard costs provide a yard stick for measuring actual performance and comparing it with the standard. By watching for deviations of actual performance from standard, management observes inefficiencies and is able to correct them. Similarly, it can detect and reward exceptional efficiency.

- **Determination of variance :** Standard costing enables to discover the cause for any variance between the actual costs and standard costs and to take remedial steps immediately.
- **Formulation of price and production policies :** Standard costing acts as a valuable guide to management in the formulation of price and production policies. It helps the management in pricing, production, profit planning etc.
- **Economy :** Standard costing provide :
  - Economy of calculation
  - Early availability of cost information and
  - The availability of anticipate changed condition.
- **Management by exception :** The management by exception is ensured because the efficient operations and processes are separated from the inefficient. In other words management does not spend time and effort searching unnecessary information, but can concentrate on important matters.
- **Increased productivity :** The setting of standards involves the effective utilization of men, materials and machines and thus may lead to economics and increased productivity in all business activity.
- **Cost Consciousness :** Standard costing creates an atmosphere of cost consciousness among executives, foremen and even the workers. It also provides incentives for efficient work.
- **Aid to inventory costing :** Standard costing provides the accuracy of product cost at various stages and is an aid to inventory costing and cost reporting.
- **Assists in preparing tenders and estimates :** Standard cost adjusted in line with current conditions provides an excellent basis for the preparation of estimates and may be used in preparing tenders or in fixing selling prices etc.
- **Full use of financial resources :** Standard costing enables to make fullest use of the financial resources of the business concern and avoids the losses due to under or over capitalization.

- **Preparation of P& L A/c :** It enables the preparation of profit and loss account at short intervals in an year and to forecast the profits during the remaining periods in such a year.
- **Helps in taking important decisions :** Standard costing provides useful cost data to the management in taking important decisions. The problem raised by inflation, rising prices etc., can be tackled effectively with the help of standard costing.

5.15 LIMITATIONS OF STANDARD COSTING

- **Difficult to set up reliable standards :** It is difficult to set up reliable and workable standards. Unless the standards are correctly fixed, the control study of variances will not be effective.
- **Expensive :** Revision of standards in the light of changed circumstances, become expensive. If the standards are not revised, they become out dated. Such standards are not reliable.
- **High degree of technical skill :** Establishment of standards may be costly and may require high degree of technical skill.
- **Fixing responsibilities is a difficult task :** For fixing responsibilities for an adverse variance, the controllable and uncontrollable portions of the variances should be segregated. This is a difficult task.
- **Adverse psychological effects :** Sometimes, standards create adverse psychological effects. If the standard is set a high-level, its non-achievement will lead to frustration and resistance. This acts as a discouragement rather than an incentive for better efficiency.
- **Unsuitable :** Due to unsuitable for jobbing type of industry, fixation of standards for each job becomes difficult and expensive. Non suitable for small industries: Installation of standard costing is an expensive affair. Hence small business concerns do not show much interest in installing standard costing.

5.16 Standard Costing and Variance Analysis

Standard costing is a technique of cost ascertainment and cost control. The most important managerial use of standard costing is the analysis of variances. Standard costing establishes the predetermined estimates based on management standards of efficient operation. The actual cost can be ascertained only when production is under taken. The predetermined cost is compared with the actual cost. If there is any variance (difference) it enables the management to take necessary corrective measures. Standard costing system is meaningful to management only when the variances are computed and analyzed properly.

The difference between the actual cost and standard cost is variance. In other words, a variance in standard costing refers to the divergence of actual cost from standard cost. If actual cost is less than standard cost, this is a sign of efficiency and the difference is termed as Favorable Variance or Positive variance. If the actual cost is more than standard cost this is a sign of inefficiency and the difference is termed as Unfavorable Variance or Negative variance. The favorable and unfavorable variances are also known as credit and debit variances respectively. Variances of different items of cost provide the key to cost control because they disclose whether and to what extent standards set have been achieved.

Meaning and Definitions of Variance Analysis

Variance Analysis is the process of analyzing variances by sub-dividing the total variance in such a way that the management can assign responsibility for standard performance. It is a continuous process. It must be followed by intelligence and actual interpretation.

Analysis of variances involves the segregation of total cost variances into different elements in such a way as to indicate or locate clearly the causes of such variances and persons held responsible for them.

Variance Analysis is defined by I.C.M.A. London as "that part of the variance accounting which relates to the analysis into constituent parts of variances between planned and actual performance."

Objectives of Variance Analysis

- To evaluate individual performance by highlighting the difference in terms of costs between attained performance and desired performances
- To assign the responsibilities to individuals to motivate them to achieve the performance targets.

Advantages of Variance Analysis

- Variance analysis is an important tool of cost control and cost reduction.
- It helps the management to apply the principle of management by exception.
- Variance analysis reveals the efficiency of performance of the business concern.
- It helps the management to maximize the profit by analyzing the variances taking corrective steps.
- Variance analysis helps in preparing business plans for various periods.
- It creates consciousness among the staff and develops team spirit among them.
- By controlling costs, variance analysis boosts the profits of the organization.

5.17 Classification of Variances

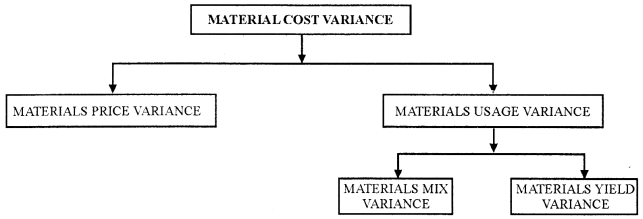
The variances may be classified into following categories :

1. Direct Materials Variances
2. Direct Labour Variances
3. Overheads Cost Variances
4. Sales or Profit Variances.

5.17.1 Direct Material Variances

Direct material variances are also known as material cost variances. The material cost variance is the difference between the standard cost of materials that should have been incurred for manufacturing the actual output and the cost of materials that has been actually incurred.

The following chart depicts the divisions and sub-divisions of material variances



Thus, in all the following may be the material variances :

(a) Material Cost Variance

(b) Material Price Variance

(c) Material Usage Variance

(d) Material Mix Variance

(e) Material Yield Variance.

The following equations may be used for verification of material cost variances.

1. Material Cost Variance = Material Price Variance + Material Usage Variance
2. Material Usage Variance = Material Mix Variance + Material Yield Variance
3. Material Cost Variance = Material Price Variance + Material Mix Variance + Material Yield Variance

(a) Materials Cost Variance: Material cost variance is the difference between standard materials cost and actual materials cost. Material cost variance arises due to change in price of materials and variations in use of quantity of materials. Material cost variance is ascertained as such :

Materials Cost Variance = Standard Material Cost - Actual Material Cost

Standard Material Cost = Standard Price per unit x Standard quantity of materials

Actual Material Cost = Actual price per unit x Actual quantity of materials

If the standard cost is more than the actual cost, the variance will be favourable, and on the other hand, if the actual cost is more than the standard cost, the variance will be unfavourable or adverse.

(b) Materials Price Variance: Materials price variance is that part of material cost variance which is due to the standard price specified and actual price paid. Material price variances may arise due to the following reasons :

i) Changes in basic prices of materials.

ii) Failure to purchase the quantities anticipated at the time when standards were set.

iii) Failure to secure discount on purchases.

iv) Failure to make bulk purchases and incurring more on freight, etc.

v) Failure to purchase materials at proper time.

vi) Not taking cash discount when setting standards.

Materials price variance is, generally, the responsibility of Purchase Manager but there may be factors beyond his control. Materials price variance is stated as :

Materials Price Variance = Actual Quantity (Standard price-Actual price)

In this case actual quantity of materials used is taken. The price of materials is taken per unit. If the answer is in plus, the variance will be favourable and it will be unfavourable if the result is in negative.

(c) Material Usage Variance: Material usage (or quantity) variance is that part of material cost which arises due to the difference in standard quantity specified and actual quantity of materials used. The difference between standard quantity and actual quantity is multiplied by standard price of material and the resultant figure will be materials usage variance. This variance may arise due to the following reasons :

i) Negligence in use of materials.

ii) More wastage of materials by untrained workers or defective methods of production.

iii) Loss due to pilferage.

iv) Use of material mix other than the standard mix.

v) More or less yield from materials than the standard set.

vi) Defective production necessitating the use of additional materials

Production Manager will be responsible for materials usage variance. The prompt presentation of materials usage variance will enable corrective measures in time. Inefficiencies can be traced and corrected before large losses have occurred. Materials usage variance is calculated as follows :

Materials Usage Variance = Standard Price (Standard Quantity - Actual Quantity)

The quantities of material specified and actually used are taken and standard price per unit is used. If the answer from the above mentioned formula is in plus, the variance will be a favourable variance but if the answer is in minus the variance will be unfavourable or adverse.

PROBLEMS

Example 1

Following is the data of a manufacturing concern. From the figures-giyen be4ow, calculate

i) Materials Cost Variance

ii) Material Price Variance

iii) Material Usage Variance.

The standard quantity of materials required for producing one ton of output is 40 units. The standard price per unit of materials is ? 3. During a particular period 90 tons of output was undertaken. The materials required for actual production were 4,000 units. An amount of? 14,000 was spent on purchasing the materials.

Solution :

Standard quantity of material = (90 x 40) = 3,600 units

Standard price per unit = Rs. 3

Actual price per unit = $\left(\frac{14000}{4000}\right)$ = 3.5 Rs.

i) Material Cost Variance = Standard material cost - Actual material cost

Standard material cost = Standard quantity x Standard Price

= 3,600 x 3 = Rs. 10,800

Material Cost Variance = 10,800-14,000 = (–) Rs. 3,200 unfavourable

ii) Material Price Variance = Actual Quantity (Standard Price per unit - Actual price per unit)

= 4,000(3.00 - 3.50) = 4,000 (-0.50) = (–) Rs. 2,000 unfavourable

iii) Material Usage Variance = Standard Price per unit (Standard Quantity - Actual Quantity)

= 3(3,600 - 4,000) = 3 (-400) = (–) Rs. 1,200 unfavourable

Verification :

Material Cost Variance = Material Price Variance + Material Usage Variance

3,200 (A) = 2,000 (A) + 1,200 (A)

$\boxed{3,200(A) = 3,200(A)}$ Verified.

Example 2

The standard materials required for producing 100 units is 120 kgs. A standard price of 0.50 paise per kg is fixed and 2,40,000 units were produced during the period. Actual materials purchased were 3,00,000 kgs. at a cost of ? 1,65,000.

Calculate Material Variance.

Solution :

Standard Quantity :

100 finished units require 120 kgs of materials

2,40,000 units will require $\left(\frac{120}{100} \times 2,40,000\right)$ = 2,88,000 kgs. of Materials

Actual price per kg. = $\left(\frac{1,65,000}{3,00,000} \times 0.55\right)$

i) Material Cost Variance

Standard material cost – Actual material cost

(2,88,000 x 0.50) - (3,00,000 x 0.55)

1,44,000 – 1,65,000 = 21,000 Unfavourable

ii) Material Price Variance

Actual Quantity (Standard Price - Actual Price)

3,00,000 (0.50 - 0.55)

3,00,000 (– 0.05) = 15,000 Unfavourable

iii) Material Usage Variance

Standard Price (Standard Quantity - Actual Quantity)

0.50 (2,88,000 - 3,00,000)

0.50 (-12,000) = 6,000 Unfavourable

Verification

Material Cost Variance = Material Price Variance + Material Usage Variance

21,000 (A) = 15,000 (A) + 6,000 (A) 21,000 (A) = 21,000 (A)

Example 3

From the data given below, calculate :

i) Material Cost Variance

ii) Material Price Variance

iii) Material Usage Variance

Products	Standard Quantity (units)	Standard Price Rs.	Actual Quantity (units)	Actual Price Rs.
A	C050	100	U 00	225
B	1,500	3.25	1,400	3.50
C	2,100	3,50	2,000	3.75

Solution :

i) Material Cost Variance = Standard Cost - Actual Cost = (Std. Qty. x Std. Rate) – (Actual Qty. x Actual Rate)

Material A = (1,050 x 2)—(1,100 x 2.25) = 2,100—2,475 = – 375

Material B = (1,500 x 3.25)— (1,400 x 3.50) = 4.875 – 4,900 = – 25

Material C = (2,100 x 3.50)—(2,000 x 7.25) = 7,350—7,500 = – 150

Material Cost Variance = 550 Unfavourable

ii) Material Price Variance = Actual Quantity (Standard Price - Actual Price)

Material A = 1,100(2,00-2,25) = 1,100 (-0.25) = - 275

Material B = 1,400(3.25-3.50) = 1,400 (-0.25) = - 350

Material C = 2,000(3.50-3.75) = 2,000(-0.25) = - 500

Material Price Variance = 1,125 Unfavourable

iii) Material Usage Variance = Standard Price (Standard Quantity - Actual Quantity)

Material A = 2 (1.050-1,100) = 2 (-50) = – 100

Material B = 3.25 (1,500 - 1,400) = 3.25 (100) = + 325

Material C = 3.50 (2,100 - 2,000) = 3.50 (100) = + 350

Material Usage Variance = 575 Favourable

Verification :

Material Cost Variance = Material Price Variance + Material Usage Variance

– 550 = – 1,125 + 575

– 550 = – 550.

(d) Material Mix Variance

It the sub-variance of material usage variance. It arises if a different blend of mix of material is used than specified. When two or more materials are used in the manufacture of a product, the difference between the standard composition and the actual composition of material mix is the material mix variance. In other words any difference between materials actually used and those specified by the formula constitutes material mix variance.

Causes for Variance

1. Using expensive/cheaper substitutes.
2. Short supply of material .
3. In efficiency of production department in mixing the materials.
4. Change in the quality of the product.

Calculation of Material Mix Variance

It is calculated din the following two situations :

1. When the actual weight of mix is equal to standard weight of mix :-
   Material mix variance = Standard cost of standard mix – Standard cost of actual mix

   or

   = (Standard price × Standard quantity) – (Standard Price × Actual quantity)

   In case standard quantity is revised due to shortage of one material, the formula will be Standard unit cost (revised standard quantity – actual quantity)
2. When actual weight of mix is different from standard weight of mix :-
   When quantities of actual material mix and standard material mix are different the following formula is used to calculate material mix variance :
   Material mix variance

$$= \frac{\text{Total weight of actual mix}}{\text{Total weight of standard mix}} \times \text{Standard cost of standard mix}$$

   = Standard cost of actual mix

   In case the standard is revised due to shortage of one material then revised standard will be used instead of standard, the formula will become :
   Material mix variance

$$= \frac{\text{Total weight of actual mix}}{\text{Total weight of revised standard mix}} \times \text{Standard cost of revised standard mix}$$

PROBLEMS

Example 1

From the following information, calculate material mix variance :

Materials	Standard		Actual	
	Quantity (units)	Price per unit (Rs.)	Quantity (units)	Price per unit Rs.
A	40	10	50	12
B	60	5	50	8

Solution :

a) Material Mix Variance = Standard Unit Cost (Standard Quantity – Actual Quantity)

Material A = 10 (–10) = Rs. 100 Unfavourable

Material B = 5 (60 - 50)

= 5(10)

Material Mix Variance = 50 (Favourable)

Example 2

Calculate material mix variance from the data given as such :

Materials	Standard		Actual	
	Quantity (units)	Price per unit	Quantity (units)	Price per unit
A	50	100	60	125
B	100	1.20	90	1.75

Due to the shortage of material A, the use of material A was reduced by 10% and that of material B increased by 5%.

Solution :

In this question the standards will be revised. Revised standards will be :

Material A = 50 - 5 (50 x 10/100) = 45

Material B = 100 + 5 (100 x 5/100) = 105

Material Mix Variance = Standard Unit Price (Revised Standard Quantity – Actual Quantity) Material

A = 2 (45 – 60)

= 2 (– 15) = – 30

Material B = 1.20 (105 – 90)

= 1.20 (15)

Material Mix Variance $\frac{-+18}{=-12}$ Unfavourable

(e) Materials Yield Variance

This is the sub-variance of material usage variance. It results from the difference between actual yield and standard yield. A standard output is expected from the raw materials put in. The actual yield may be more or less than the specified standard. Materials yield variance is defined as "that portion of the direct materials usage variance which is due to the standard yield specified and the actual yield obtained". This sub-variance is very important for processing industries in which final product of one process becomes the raw material of another process.

The yield in different processes will enable to have a material control system. If actual yield is more than the standard yield, it is a sign of efficiency. A low yield indicates more consumption of raw materials. This sub-variance may arise due to low quality of materials, defective methods of production, carelessness in handling materials, etc.

Material yield variance is calculated with the following formula :

Standard Rate (Actual yield - Standard yield)

$$\text{Standard Rate} = \frac{\text{Standard Cost of Standard mix}}{\text{Net standard output i.e., Gross output} - \text{Standard loss}}$$

There may be a situation where standard mix may be different from the actual mix. In this case the standard is revised in relation to actual mix and the question is solved with the revised standard and not with the original standard. The standard rate will be calculated as follows :

$$\text{Standard Rate} = \frac{\text{Standard Cost of revised standard mix}}{\text{Net standard output i.e., Gross output} - \text{Standard loss}}$$

In the earlier variances if the standard was more than the actual, the variance was favourable. But, in case of material yield variance the case is different. When actual yield is more than the standard yield, the variance will be favourable.

PROBLEMS

Example 1

From the following information, calculate material yield variance :

Materials	Quantity (units)	Price per unit Rs.	Quantity (units)	Price per unit Rs.
A	80	5	60	4.50
B	170	9	90	8.00
	150		150	

There is a standard loss of 10%.

Actual yield is 125 units.

Solution :

Material Yield Variance :

Standard Rate (Actual Yield – Standard Yield)

$$\text{Standard Rate} = \frac{\text{Standard Cost of Standard mix}}{\text{Net Standard Output}}$$

Net std output = 150 – 10% on 150

= 150 – 15

= 135

$$\text{Standard Rate} = \frac{(80 \times 5 + 70 \times 9)}{135(150 - 10\%)} = \frac{1030}{135} = \text{Rs. } 7.63$$

Material Yield Variance = 7.63 (125 – 135)

= 7.63 (–10) = Rs. 76.3 Adverse.

Example 2

The standard cost of a certain chemical mixture is :

33% Material A at Rs. 25 per kg, and

65% Material B at Rs. 36 per kg.

A standard loss of 5% is expected in production. During a period, there is used:

125 kg. of Material A at Rs. 27 per kg; and

275 kg. of Material B at Rs. 34 per kg.

The actual output was 365 kg.

Calculate : (a) Material cost variance, and (b) Material yield variance :

Solution :

Calculation of Standard Quantity and Standard Cost of Material

Material A = 400 × 35/100 = 140 kg. at Rs. 25 per kg. = 3,500

Material B = 400 × 65/100 = 260 kg. at Rs.36 per kg. = 9,360

Actual yield/output is 365 kg, so standard cost will be adjusted or revised accordingly.

Standard cost for actual yield/output = $12,860 \times \frac{365}{380}$ = Rs.12,352.37

Calculation of Actual Cost of Material

	Rs.
Material A = 125 kg. at Rs. 27 per kg.	3,375
Material B = 275 kg. at Rs. 34 per kg.	9,350
Actual cost of material	12,725

a) Material Cost Variance = Standard Cost of Materal – Actual Cost of Material

= 12,352.37 – 12,725 = 372.63 (Adverse)

b) Material Yield Variance = Standard Rate (Actual Yield – Standard Yield)

Standard Rate = $\frac{\text{Standard Cost of Standard Mix}}{\text{Net Standard Output}}$

= $\frac{12,860}{380}$ = 33.84

Material Yield Variance = 33.84 (365 – 380)

= Rs. 507.6 Adverse.

Example 3

The standard mix of a product is as under :

A	60 units at 15 P. per unit	Rs. 9
B	80 units at 20 P. per unit	Rs. 16
C	100 units at 25 P. per unit	Rs. 25
	240	50

Ten units of finished product should be obtained from the above mentioned mix.

During the month of Jan. 2000 ten mixes were completed and the consumption was as follows :

A	640 units at 20 P. per unit	Rs. 128
B	960 units at 15 P. per unit	Rs. 144
C	840 units at 30 P. per unit	Rs. 252
	2,440	524

The actual output was 90 units.

Calculate varios material variances.

Solution :

i) Material Cost Variance

The standard has been given for producing 10 units in one mix. Ten mixes have been completed, so standard production will be 100 units.

Standard cost for 100 Units = 50 x 10 = 500

Actual yield is 90 units, so standard cost will be adjusted accordingly.

Standard cost for actual yield = $\frac{500}{100}$ x 90 = Rs. 450

Material Cost Variance = Standard Cost - Actual Cost

= 450 – 524 = 74 (unfavourable)

ii) Material Price Variance = Actual Quantity (Standard Price - Actual Price)

Material A = 640 (0.15 - 0.20)

= 640 (-0.05) = 32 unfavourable

Material B = 960(0.20-0.15)

= 960 (0.05) = 48 favourable

Material C = 840 (0.25 - 0.30)

= 840 (-0.05) = 42 unfavourable

Material Price Variance (A+B+C) = 26 unfavourable

iii) Material Usage Variance :

The standard quantity will be revised in proportion to actual production. Revised quantity will be :

$$A = \frac{600}{100} \times 90 = 540$$

$$B = \frac{800}{100} \times 90 = 720$$

$$C = \frac{1000}{100} \times 90 = 900$$

Material Usage Variance = Standard Price (Standard Quantity - Actual Quantity)

Material A : 15 P. (540 - 640)

15 (- 100) = 15 unfavourable

Material B : 20 P. (720 - 960)

.20 (– 240) = 48 unfavourable

Material C: 25 P. (900 - 840)

25 (60) = 15 favourable

Material Usage Variance = 48 unfavourable.

iv) Material Mix Variance

There is a difference between standard quantity (240 x 10 = 2,400) and actual quantity (2,440), so the standard will be revised first.

Revised standard quantity will be :

$$A = \frac{60}{100} \times 2{,}440 = 610$$

$$B = \frac{80}{240} \times 2{,}440 = 813 \text{ (approximately)}$$

$$C = \frac{100}{240} \times 2{,}440 = 1{,}017 \text{ (approximately)}$$

Material Mix Variance : Standard Price (Revised Standard Quantity - Actual Quantity)

Material A : 15 P. (610 - 640)

.15 (– 30) = 4.50 unfavourable

Material B : 20 P. (813 - 960)

.20 (-147) - 29.40 unfavourable

Material C : 25 P. (1017 - 840)

.25(177) = 44.25 favourable

Material Mix Variance = 10.35 favourable

v) Material Yield Variance = Standard Rate (Actual Yield - Standard Yield)

$$\text{Standard Rate} = \frac{\text{Standard Cost of Standard mix}}{\text{Standard Output}}$$

$$= \frac{50}{10} = \text{Rs. } 5$$

$$\text{Standard Yield} = \frac{10}{240} \times 2440 = 101.67 \text{ units}$$

Yield Variance = 5 (90 – 101.67) = Rs.58.35 unfavourable

Verification :

i) Material cost variance = Material Price Variance + Material Usage Variance

or, – 74 = - 26 - 48 = - 74

ii) Material Usage Variance = Material Mix Variance + Material Yield Variance

or, – 48 = 10.35 - 58.35 = - 48.

5.17.2 Direct Labour Variances

Labour variances can be discussed as follows :

(a) Labour Cost Variance

(b) Labour Rate of Pay or Wage Rate Variance

(c) Total Labour Efficiency or Labour Time Variance

(d) Net Labour Efficiency Variance /

(e) Idle Time Variance

(f) Labour Mix or Gang Composition Variance

(g) Labour Yield or Sub-efficiency Variance

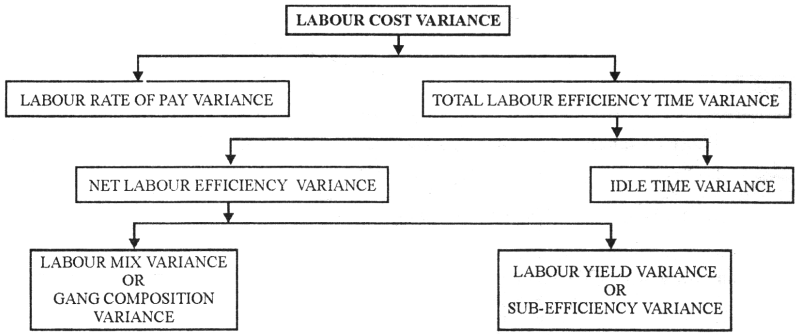
(a) Labour Cost Variance

Labour cost variance is the difference between the standard direct wages specified for the activity and the actual wages paid. Labour cost variance is the function of labour rate of pay and total labour efficiency or labour time variance. It arises due to a change in either wage rate or in time or both. Labour cost variance is calculated as follows :

Labour Cost Variance = Standard Labour Cost for Actual Output – Actual Labour Cost

= (Standard Time for Actual Output × Standard Wage Rate) – (Actual Time × Actual Wage Rate)

The following chart depicts the divisions and sub-divisions of labour cost variance:



(b) Labour Rate of Pay or Wage Rate Variance

It is that part of labour cost variance which arises due to a change in specified wage rate. Labour rate variance arises due to the following reasons :

(i) Change in basic wage rate or piece-work rate.

(ii) Employing persons of different grades then specified.

(iii) Payment of more overtime than fixed earlier.

(iv) New Workers being paid different rates than the standard rates.

(v) Different rates being paid to workers employed for seasonal work or excessive work load.

The responsibility for wage rate variance lies with the production cost centre. The rates are generally beyond the control of any one. The wage rates are determined by demand and supply conditions of labour conditions in labour market, wage board awards, etc. So, wage rate variance is generally uncontrollable except if it arises due to the development of wrong grade of labour for which production foreman will be responsible. This variance is calculated by the following formula :

Labour Rate of Pay Variance = Actual Time (Standard Rate – Actual Rate)

The variance will be favourable if actual rate is less than the standard rate and it will be unfavourable or adverse if actual rate is more than the standard rate.

(c) Total Labour Efficiency or Labour Time Variance

It is that part of labour cost variance which arises due to the difference between standard labour hours specified and the actual labour hours paid for including idle time. This variance helps in controlling efficiency of workers. The reasons for this variance are:

(i) Lack of proper supervision

(ii) Defective machinery and equipment.

(iii) Insufficient training and incorrect instructions.

(iv) Increase in labour turnover

(v) Bad Working Conditions.

(vi) Discontentment among workers due to unsatisfactory personnel relations.

(vii) Use of non-standard material requiring more time to complete work.

Labour efficiency variance is calculated as follows :

Total Labour Efficiency Variance = Standard Wage Rate (Standard Time for Actual Output – Actual Time Paid).

The actual time, while calculating this variance includes abnormal idle time.

If actual time taken for doing a work is more than the specified standard time, the variance will be unfavourable. On the other hand, if actual time taken for a job is less than the standard time, the variance will be favourable.

PROBLEMS

Example 1

Calculate labour variances from the following information :

Gross wages direct (Rs.)	28,080
Standard hours produced	8,640
Standard rate per hour (Rs.)	3
Actual hours worked	8,200

Solution :

(i) Labour Cost Variance = Standard Labour Cost – Actual Labour Cost

= (Standard Time × Standard Rate) – (Actual Time × Actual Rate)

$$= (8,640 \times 3) - \left(8,200 \times \frac{28,080}{8,200}\right)$$

(ii) Labour Rate of Pay Variance

= Actual Time (Standard Labour Rate – Actual Labour Rate)

= 8,200 (3 – 3.42)

= Rs. 3,444 (Adverse)

(iii) Labour Efficiency Variance

= Standard Labour Rate (Standard Time – Actual Time)

= 3 (8,640 – 8,200)

= 3 (440)

= Rs. 1,320 (Favourable)

Example 2

From the following information regarding a standard product, calculate labour variances.

Labour rate	50 paise per hour
Hours per unit	10 hours
Units produced	500
Hours worked	6,000
Actual labour cost	2,400

Solution :

Standard Time = 500 × 10 = 5,000 hours

Standard Labour Rate = Re. 0.50 per hour.

Actual Time = 6,000 hours

Actual Labour Rate $= \frac{2,400}{6,000}$ = Re. 0.40 per hour.

(i) Labour Cost Variance = Standard Labour Cost – Actual Labour Cost

= (Standard Time × Standard Rate) – (Actual Time × Actual Rate)

= (5,000 × 0.50) – (6,000 × 0.40)

= (2,500) – (2,400) = Rs. 100 (Favourable)

(ii) Labour Rate of Pay Variance = Actual Time (Standard Rate – Actual Rate)

= 6,000 (0.50 – 0.40)

= Rs. 600 (Favourable)

(iii) Labour Efficiency Variance = Standard Rate (Standard Time – Actual Time)

= 0.50 (5,000 – 6,000)

= Rs. 500 (Unfavourable)

Example 3

Find out different labour variances :

	Standard	Actual
Output	1,000 units	1,200 units
Rate of payment	Rs. 6 per unit	Wages paid with bonus Rs. 8,000
Time taken	50 hours	40 hours

Solution :

(i) Labour Cost Variance = Standard Labour Cost (for actual output) – Actual Labour Cost

= (1,200 × 6) – 8,000

= Rs. 800 (Adverse)

(ii) Labour Rate of Pay Variance = Actual Time (Standard Rate – Actual Rate)

Standard time for 1,200 units = $\frac{50}{1,000}$ × 1,200 = 60 hours

Standard rate = $\frac{7,200}{60}$ = Rs. 120 per hour.

Actual Rate = $\frac{8,000}{40}$ = Rs. 200 per hour.

Labour Rate of Pay Variance = 40 (120 – 200)

= Rs. 3,200 (Adverse)

(iii) (Labour Efficiency Variance = Standard Rate (Standard Time – Actual Time)

= 120 (60 – 40)

= Rs. 2,400 (Favourable)

Verification :

Labour Cost Variance = Labour Rate of Pay Variance + Labour Efficiency Variance

or, 800 (A) = 3,200(A) + 2,400 (F)

or, 800(A) = 800 (A)

(d) Net Labour Efficiency Variance

This variance is that part of total labour efficiency variance which is causal due to the difference between the standard labour hours specified and the actual labour hours worked excluding abnormal idle time. This variance is calculated as follows :

(Net) Labour Efficiency Variance = Standard Rate (Standard Time for Actual Output – Actual Time Worked)

= Standard Rate × [(St. Time) – (Actual Time paid – Idle Time)]

(e) Idle Time Variance

This variance is a sub-variance of labour efficiency variance. It is the standard cost of actual time paid to workers for which they have not worked due to abnormal reasons. The Reasons for idle time may be power failure, defect in machinery, non-supply of materials, etc. Idle time variance should be segregated from the labour efficiency variance otherwise it will show inefficiency on the part of workers though they are not responsible for this. Idle time variance is always adverse and needs investigation for its causes. This variance is calculated as follows :

Idle Time Variance - Idle Hours x Standard Rate

(f) Labour Mix or Gang Composition Variance

This variances arises due to change in the actual gang composition than the standard gang composition. The change in labour composition may be caused by the shortage of one grade of labour necessitating the employment of another grade of labour. This variance shows to the management how much labour cost variance is due to the change in labour composition.

Labour mix variance is like material mix variance and is calculated in the same way.

It may be calculated in two ways :

(i) When standard labour mix is equal to actual labour mix.

(ii) When standard labour mix is different from actual labour mix.

(i) When standard and actual times of the labour mix are same: In this case the variance is calculated as follows :

Labour Mix Variance = Standard Cost of Standard Labour Mix - Standard Cost of Actual Labour Mix.

Due to the non-availability of one grade of labour, there may be a change in standard labour mix, then revised standard will be used for standard mix. The formula will be :

Labour Mix Variance = Standard cost of Revised Standard Labour Mix - Standard Cost of Actual Labour Mix.

(ii) When Standard and actual time of labour mix are different:

In this case the variance will be calculated as follows :

$$\left[\left(\frac{\text{Total Time of Actual Labour Mix}}{\text{Total Time Standard Labour Mix}} \times \text{Standard cost of Standard Mix}\right) - (\text{Standard Cost of Actual Labour Mix}\right]$$

As in the earlier case, if labour composition is revised because of non-availability of one grade of labour then revised standard mix will be used instead of standard mix and the formula will become :

$$\left[\left(\frac{\text{Total Time of Actual Labour Mix}}{\text{Total Time Revised Standard Labour Mix}} \times \text{Standard cost of Revised Standard Mix}\right) - (\text{Standard Cost of Actual Labour Mix}\right]$$

(g) Labour Yield or Sub-Efficiency Variance

The labour yield variance or the labour sub-efficiency variance arises due to the standard output specified and the actual output obtained. This variance is calculated as follows :

Labour Yield/Sub-efficiency Variance
= Standard Labour Cost per unit of output
(Actual Yield – Standard Yield for Actual Time)

PROBLEMS

Example 1

In a manufacturing concern, the standard time fixed for a month is 8,000 hours. A standard wage rate of Rs. 2.25 P. per hour has been fixed. During one month, 50 workers were employed and average working days in a month are 25. A worker works for 7 hours in a day. Total wage bill of the factory for the month amounts to Rs. 21,875. There was a stoppage of work due to power failure (idle time) for 100 hours. Calculate various labour variances.

Solution :

Standard Time = 8000 Hours

Standard Wage Rate = Rs. 2.25 P. per hour

Actual Time = (50 × 25 × 7) = 8750 hours

Actual Wage Rate = $\left(\frac{21875}{8750}\right)$ = Rs. 2.50 per hour

(i) Labour Cost Variance = Standard Labour Cost - Actual Labour Cost
= (Standard Time × Standard Rate) – (Actual Time × Actual Rate)
= (8000 × 2.25) – (8750 × 2.50)
= 18,000 – 21,875 = Rs. 3,875 (Adverse)

(ii) Rate of Pay Variance = Actual Time (Standard Labour Rate – Actual Labour Rate)
= 8750 (2.25 – 2.50)
= 8750 (–0.25) = Rs. 2187.50 (Adverse)

(iii) Net Labour Efficiency Variance
= Standard Labour Rate (Standard time – Actual time worked)
= 2.25 (8000 – 8650)
= 2.25 (650) = Rs. 1462.50 P. (Adverse)
In this variance actual time will be = Actual time paid - Idle time
= Actual time = 8750 – 100 = 8650 hours.

(iv) Idle time Variance = Idle Time × Standard Rate = 100 × 2.25
Idle Time Variance = Rs. 255 (Adverse).

Verification :

Labour Cost Variance = Labour Rate Variance + Net Labour Efficiency Variance + Idle Time Variance

–3875 = –2187.50 – 1462.50 – 225

– 3875 = –3875

Example 2

The information regarding the composition and the weekly wage rates of labour force engaged on a job scheduled to be completed in 30 weeks are as follows :

Category of workers	No. of workers	Standard	Actual	
		Weekly Wage rateperworker	No. of workers	Weekly Wage rateperworker
			Rs.	Rs.
Skilled	75	60	70	70
Semi-skilled	45	40	30	50
Unskilled	60	30	80	20

The work was completed in 32 weeks. Calculate various labour variances.

Solution :

(i) Labour Cost Variance = Standard Labour Cost-Actual labour Cost

			Rs.
Standard Labour Cost			
Skilled	:	75 × 60 × 30 =	1,35,000
Semi-skilled	:	45 × 40 × 30 =	54,000
Unskilled	:	60 × 30 × 30 =	54,000
Total			2.43,000
Actual Labour Cost:			
Skilled	:	70 × 70 × 32 =	1,56,800
Semi-skilled	:	30 × 50 × 32 =	48,200
Unskilled	:	80 × 20 × 32 =	51,000
Total			2,56,000

Total Labour Cost Variance : 2,43,000 – 2,56,000 = Rs. 13,000 Adverse

(ii) Labour Rate Variance = Actual Time (Standard Rate – Actual Rate)

Skilled	:	2,240 (60 – 70)			
		2,240 (– 10)	=	Rs. 22,400	Adverse
Semi-skilled	:	960 (40 – 50)			
		960 (– 10)	=	Rs. 9,600	Adverse
Unskilled	:	2,560(30 – 20)			
		2,560(10)	=	Rs. 25,600	Favourable
Labour Rate Variance			=	Rs. 6,400	Adverse

(iii) Labour Efficiency Variance = Standard Rate (Standard Time – Actual Time)

Skilled	:	60 (2,250 – 2,240)			
		60(10)	=	Rs. 600	Favourable
Semi-skilled	:	40 (1,350 – 960)			
		40(390)	=	Rs. 15,600	Favourable
Unskilled	:	30 (1,800 – 2,560)			
		30 (–760)	=	RS. 22,800	Adverse
Labour Efficiency Variance			=	Rs. 6,600	Adverse

Verification :

Labour Cost Variance = Labour Rate Variance + Labour Efficiency Variance

–13,000 = –6,400 – 6,600

–13,000 = –13,000.

Example 3

The following data is taken out from the books of a manufacturing concern :

Budgeted labour composition for producing 100 articles

20 Men @ Rs. 1.25 per hour for 25 hours

30 women @ 1.10 per hour for 30 hours

Actual labour composition for producing 100 articles

25 Men @ Rs. 1.50 per hour for 24 hours

25 Women @ Re. 1.20 per hour for 25 hours

Calculate : (i) Labour Cost Variance, (ii) Labour Rate Variance, (iii) Labour Efficiency Variance, (iv) Labour Mix Variance.

Solution :

(i) Labour Cost Variance = Standard Labour Cost – Actual Labour cost

Men	:	(20 × 25 × 1.25) – (25 × 24 × 1.50)		
		625 – 900	= Rs. 275	Adverse
Women	:	(30 × 30 × 1.10) – (25 × 25 × 1.20)		
		990 – 750	= Rs. 240	Favourable
Labour Cost Variance		= –275 + 240	= Rs. 35	Adverse.

(ii) Labour Rate Variance = Actual Time (Standard Rate – Actual Rate)

Men	:	600 (1.25 – 1.50)		
		600 (–0.25)	= Rs. 150.00	Adverse
Women	:	625 (1.10 – 1.20)		
		625 (–0.10)	= Rs. 62.50	Adverse
Labour Rate Variance =			= Rs. 212.50	Adverse.

(iii) Labour Efficiency Variance = Standard Rate (Standard Time-Actual Time)

Men	:	1.25 (500 – 600)		
		1.25 (–100)	= Rs. 125	Adverse
Women	:	1.10 (900 – 625)		
		1.10 (275)	= Rs. 302.5	Favourable
Labour Efficiency Variance =			= Rs. 177.50	Favourable

(iv) Labour Mix Variance :

Standard time for Men and Women = 1,400 hours

Actual time for Men and Women = 1,225 hours

When standard time of labour mix is different from the actual time of labour mix, the formula for calculating labour mix variance is :

$$\left[\frac{\text{Total Time of Act. Lab. Mix}}{\text{Std. Time of Rev. Std. Lab. Mix}} \times \text{Std. cost of Rev. Std. Lab. Mix}\right]$$

– (Std. Cost of Act. Lab Mix)

$$= \left[\frac{1,225}{1,400} \times (20 \times 25 \times 1.25) + (30 \times 30 \times 1.10)\right]$$

– [(25 × 24 × 1.25) + 25 × 25 × 1.10)]

$$= \frac{1,225}{1,400} \times (625 + 990) - (750 + 687.50)$$

$$= \left[\frac{1,225}{1,400} \times 1,615\right] - 1,437.50$$

= 1413.12 – 1437.50 = Rs. 24.39 unfavourable

Example 4

Calculate labour variances from the following data :

	Standard	Actual
Output in units	2,000	2,500
Number of workers employed	50	60
Number of working days in a month	20	22
Average wage per man per month (Rs.)	280	330

Solution :

Standard wage rate per day = $\frac{280}{20}$ = Rs. 14

Actual wage per day = $\frac{330}{22}$ = Rs. 15

Standard man days for an output of 2,000 units = 50 × 20 = 1000

Since actual output is more than the standard output, standard time will be adjusted.

Standard man days for actual output = $\frac{1,000}{2,000} \times 2500 = 1250$

(i) Labour Rate Variance = Actual Time (Standard Rate – Actual Rate)

1320 (14 – 15)

1320 (– 1) = Rs. 1320 Adverse.

(ii) Labour Efficiency Variance = Standard Rate (Standard Time - Actual Time)

14 (1250 – 1320)

14 (–70) = Rs. 980 Adverse.

(iii) Labour Cost Variance = Labour Rate Variance + Labour Efficiency Variance

= (–1320) +(–980) = Rs. 2,300 Adverse.

Example 5

Calculate labour mix variance from the following figures:

Budgeted Labour Force

80 Skilled workers @ Rs. 225 per month

160 Semi-skilled workers 200 per month.

Actual Labour Force

120 Skil led workers @ Rs. 240 per month

180 Semi-skilled workers @ Rs. 225 per month.

Due to shortage of skilled workers, it was decided to reduce skilled workers by 10% and increase semi-skilled workers by 5%.

Solution :

Revised Standard:

Skilled = $80 - 8\left(80 \times \frac{10}{100}\right)$ = 72

Semi-skilled = $160 + 8\left(160 \times \frac{5}{100}\right)$ = 168

240

There is difference between revised standard labour mix and actual labour mix so the formula will be :

$$\left[\frac{\text{Total Time of Actual Labour Mix}}{\text{Std. Time of Rev. Std. Labour Mix}} \times \text{Std. Cost of Rev. Std. Labour Mix}\right]$$

– (Std. Cost of Actual Labour Mix)

$\frac{300}{240}$ (72 × 225 + 168 × 200) – (120 × 225 +180 × 200)

$\frac{300}{240}$ (16,200 + 33,600) – (27,000 + 36,000)

$\frac{300}{240}$ × 49,800 – 63,000

62,250 – 63,000 = Rs. 750 Adverse.

5.17.3 Overhead Cost Variances

Overhead costs are the operating costs of a business which cannot be identified or allocated but which can be apportioned to, or absorbed by cost centres or cost units.

According to the terminology of Cost Accountancy (ICWA, London) overhead is defined as "the aggregate of indirect material cost, indirect wages (indirect labour cost) and indirect expenses". Thus, overhead costs are indirect costs and are important for the management for the purposes of cost control. Under cost accounting, overhead costs are absorbed by cost units on some suitable basis. Under standard costing, overhead rates are predetermined in terms of either labour hours (per hour) or production units (per unit of output).

The actual labour hours or actual units produced are multiplied by the standard overhead rate to determine the standard overhead cost that ought to have been incurred. Standard overhead cost so calculated is then compared with actual overhead cost to find out the variance, if any, so as to take corrective measures. Overhead cost variance can, thus, be defined as the difference between the standard cost of overhead allowed for actual output (in terms of production units or labour hours) and the actual overhead cost incurred.

The formula for the calculation of overhead cost variance is given below:

Overhead Cost Variance = Actual Output × Standard Overhead Rate per unit – Actual Overhead Cost

Or, = Standard Hours for Actual Output × Standard Overhead Rate per hour – Actual Overhead Cost

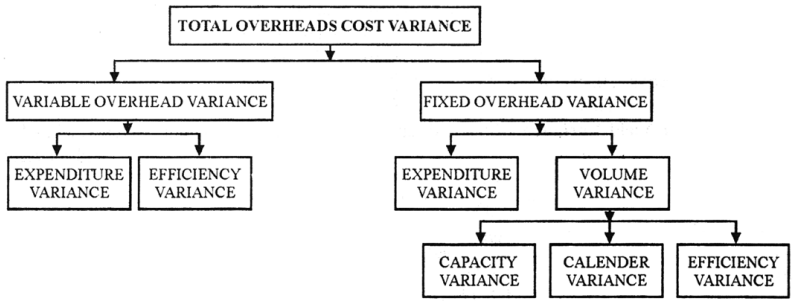
An analytical study of the behaviour of overheads in relation to changes in volume of output reveals that there are some items of cost which tend to vary directly with the volume of output whereas, there are others which remain unaffected by variations in the volume of output achieved or labour hours spent. The former costs represent the variable overhead and the latter fixed overheads.

Thus, overhead cost variances can be classified as :

(i) Variable Overhead Variance, and

(ii) Fixed Overhead Variance

Variable Overhead Variance can further be analysed into (a) Variable Overhead Expenditure or Spending Variance, and (b) Variable Overhead Efficiency Variance. Similarily, Fixed Overhead Variance may be sub-divided into (a) Fixed Overhead Expenditure Variance, and (b) Fixed Overhead Volume variance. Further, Fixed volume variance can be analysed into capacity, calender and efficiency variances. The following diagram shows the entire classification of overhead cost variance :



(i) VARIABLE OVERHEAD VARIANCE

Variable overheads vary directly with the volume of output and hence, the standard variable overhead rate remains uniform. Therefore, computation of variable overhead

variance, also known as variable overhead cost variance parallels the material and labour cost variances. Thus, variable overhead cost variance (VOCV) is the difference between the standard variable overhead cost for actual output and the actual variable overhead cost. It can be calculated as follows :

VOCV = (Actual Output × Standard Variable Overhead Rate per unit) – Actual Variable Overheads

Or, = (Standard Hours for Actual Output × Standard Variable Overhead Rate per hour) – Actual Variable Overheads.

In case information relating to standard hours allowed for actual output and the actual time (hours) taken is available, variable overhead cost variance can be further analysed into :

(a) Variable Overhead Expenditure or Spending Variance, and

(b) Variable Overhead Efficiency Variance.

(a) Variable Overhead Expenditure or Spending Variance. This is the differnce between the standard variable overheads for the actual hours and the actual variable overheads incurred and can be calculated as:

Variable Overhead Expenditure Variance

= (Actual Hours × Standard Variable Overhead Rate per hour) – Actual Variable Overhead

Or, = Actual Hours (Standard Variable Overhead Rate – Actual Variable Overhead Rate)

(b) Variable Overhead Efficiency Variance. It represents the difference between the standard hours allowed for actual production and the actual hours taken multiplied with the standard variable overhead rate. Symbolically:

Variable Overhead Efficiency Variance

= Standard Variable Overhead Rate (Standard Hours for Actual Output) – Actual Hours.

PROBLEMS

Example

Calculate variable overhead variances from the following data :

Budgeted Production for January, 2014	3000 units
Budgeted Variable Overhead	Rs. 15,000
Standard Time for One Unit	2 hours
Actual Production for January, 2014	2,500 units
Actual Hours Worked	4500 hours
Actual Variable Overhead	Rs. 13,500

Solution :

1. Variable Overhead Cost Variance (VOCV)

VOCV = Actual Output × Standard Variable Overhead Rate – Actual Variable Overhead

= Rs. (2500 × 5) – 13500 = Rs. 1000 (Adverse)

(Standard Variable Overhead Rate = Rs.) $\frac{15,000}{3,000}$ = Rs. 5 per unit

2. Variable Overhead Expenditure or Spending Variance (VOSV)

VOSV = (Actual Hours × Standard Variable Overhead Rate) – Actual Variable Overhead

= Rs. (4500 × 2.50) – 13500

= Rs. 11250 – 13500 = Rs. 2250 (Adverse)

3. Variable Overhead Efficiency Variance (VOEV)

VOEV = Standard Variable Overhead Rate (Standard Hours for Actual Output – Actual Hours)

= Rs. 2.50 (5000 – 4500) = Rs. 1250 (Favourable)

Verification

VOCV = VOSV + VOEV

– 1000 = – 2250 + 1250

or –1000 = –1000

(ii) FIXED OVERHEADS VARIANCE

This variance is calculated as :

Actual Output × Standard Fixed Overheads Rate – Actual Fixed Overheads.

The standard fixed overhead rate is calculated by dividing budgeted fixed overheads by standard output specified.

Fixed overheads variance may be divided into expenditure and volume variances.

(a) Expenditure Variance: It is that part of fixed overhead variance which is due to the difference between budgeted expenditure and actual expenditure.

Overhead Expenditure Variance = Budgeted Fixed Overheads - Actual Fixed Overheads

(b) Volume Variance: This variance shows a variation in overhead recovery due to budgeted production being more or less than the actual production. When actual production is more than the standard production, it will show an over-recovery of fixed overheads and the variance will be favourable. On the other hand, if actual production is less than the standard production it will show an under recovery and the variance will be unfavourable.

Volume variance may arise due to change in capacity, variation in efficiency or change in budgeted and actual number of working days. Volume variance is calculated as follows :

Volume Variance = Actual Output × Standard Rate – Budgeted Fixed Overheads

Volume variance is sub-divided into following variances :

(i) Capacity Variance: It is that part of volume variance which arises due to over-utilisation or under- utilisation of plant and equipment. The working in the factory is more or less than the standard capacity. This variance arises due to idle time caused by strikes, power failure, non-supply of materials, break down of machinery, absenteeism etc. Capacity variance is calculated as follows :

Capacity Variance = Standard Rate (Revised Budgeted Units – Budgeted Units) Or, Standard Rate (Revised Budgeted Hrs – Budgeted Hrs).

(ii) Calendar Variance: This variance arises due to the deference between actual number of days and the budgeted days. It may arise due to more public holidays announced than anticipated or working for more days because of change in holidays schedule, etc. If actual working days are more than budgeted, the variance will be favourable and it will be unfavourable if actual working days are less than the budgeted number of days Calendar variance can be expressed as follows:

Decrease or Increase in number of units produced due to the difference of budgeted and actual days x Standard Rate per unit.

(iii) Efficiency Variance: This is that portion of the volume variance which arises due to increased or reduced output because of more or less efficiency than expected. It signifies deviation of standard quantity from the actual quantity produced. This variance is related to the efficiency variance of labour. Efficiency variance is calculated as :

Standard Rate (Actual Quantity – Standard Quantity)

Or, Standard.Rate per hour (Standard Hours Produced – Actual Hours)

Example 1

From the following information compute :

(i) Fixed Overheads Variance

(ii) Expenditure Variance

(iii) Volume Variance

(iv) Capacity Variance

(v) Efficiency Variance.

	Budget	Actual
Fixed Overheads for November	Rs. 20,000	20,400
Units of Production in November	10,000	10,400
Standard time for 1 Unit	2 hours	
Actual Hours Worked		20,100 hours

Solution :

Standard time = 10,000 × 2 = 20,000 hours

$$\text{Fixed Overheads Rate} = \frac{20,000}{20,000} = \text{Re. } 1$$

(i) Fixed Overheads Variance = Actual Hours × Fixed Overheads Rate – Actual Fixed Overheads

= 20,100 × 1 – 20,400

20,100 - 20,400 = Rs. 300 Unfavourable

(ii) Expenditure Variance = Budgeted Fixed Overheads – Actual Fixed Overheads

20,000 – 20,400 = Rs. 400 Unfavourable.

(iii) Volume Variance = Actual Hours Worked × Fixed Overheads Rate – Budgeted Fixed Overheads

20,100 × 1 – 20,000 = Rs. 100 Favourable.

(iv) Capacity Variance = Fixed Overheads Rate (Revised Budgeted Hours – Budgeted Hours)

$$\text{Revised Budgeted Hours} = \frac{20,000}{10,000} \times 10,400 = 20,800 \text{ hours}$$

Capacity Variance = 1 (20,800 – 20,000) = Rs. 800 Favourable.

(v) Efficiency Variance = Fixed Overheads Rate (Actual Hours – Revised Standard Hours)

1 (20,100 – 20,800) = Rs. 700 Unfavourable.

Verification :

(i) Fixed Overheads Variance = Expenditure + Volume Variance

– 300 = –400 + 100

– 300 = –300

(ii) Volume Variance = Capacity Variance + Efficiency Variance

+ 100 = + 800 – 700

+ 100 = + 100.

Example 2

A Cost Accountant of a company was given the following information regarding the overheads for February 2014 :

(a) Overhead Cost Variance Rs. 1400 (Adverse)

(b) Overhead Volume Variance Rs. 1000 (Adverse)

(c) Budgeted Hours for February 2014, 1200 hours

(d) Budgeted Overheads for February 2014., Rs. 6000

(e) Actual Rate of Recovery of Overheads Rs. 8 per hour

You are required to assist him in computing the following for February 2014 :

1. Overhead Expenditure Variance
2. Actual Overheads incurred.
3. Actual hours for actual production
4. Overheads Capacity Variance.
5. Overheads Efficiency Variance.
6. Standard Hours for Actual Production.

Solution :

1. Overhead Expenditure Variance :

Overhead Cost Variance = Expenditure Variance + Volume Variance

1400 (Adverse) = Expenditure Variance + 1000 (Adverse)

or, Expenditure Variance = 1400 (Adverse) – 1000 (Adverse)

= – 1400 – (–1000) = 400 (Adverse)

2. Actual Overhead Incurred :

Overhead Expenditure Variance = Budgeted Fixed Overhead – Actual Fixed Overheads.

or, Actual Fixed Overheads = Budgeted Fixed Overhead – Overhead Expenditure Variance

= 6000 (Fav.) –400 (Adv)

= 6000 – (–400) = Rs. 6400

3. Actual Hours for Actual Production

$$= \frac{\text{Actual Overheads Incurred}}{\text{Actual Rate of Recovery of Overheads}}$$

$$= \frac{6400}{8} = 800 \text{ hours}$$

4. Overhead Capacity Variance

= Standard Rate (Revised Budgeted or Actual Hours – Budgeted Hours)

$$= \frac{6000}{1200} (800 - 1200) = \text{Rs. } 2000 \text{ (Adverse)}$$

Rs. 2000 (Adverse)

5. Overhead Efficiency Variance

= Volume Variance = Capacity Variance + Efficiency Variance (as there is no calender variance)

or, Efficiency Variance = Volume Variance – Capacity Variance

= 1000 (Adverse) – 2000 (Adverse)

= –1000 + 2000 = Rs. 1000 (Favourable)

6. Standard Hours for Actual Production

= Volume Variance (in terms of labour hours)

= Standard Rate per Hour (Standard Hours for Actual Output – Budgeted Hours)

Or, 1000 (Adverse) $= \frac{6000}{1200}$ (Standard Hours for Actual Output – 1200 hrs.)

Or, $\left(-1000 \times \frac{1,200}{6,000}\right)$ = Standard Hours for Actual Output–1200 hrs.

Or, Standard Hours for Actual Production

= –200 + 1200 Hrs. = 1000 hours.

Example 3

The following data has been collected from the records of a unit for computing the various fixed overhead variances for a period :

	Rs.
Number of budgeted working days	25
Budgeted man hours per day	6,000
Output (budgeted) per man hour (in units)	1
Fixed overhead cost as budgeted	1,50,000
Actual number of working days	27
Actual man hours per day	6,300
Actual output per man hour (in units)	0.9
Actual fixed overhead incurred	1,56,000

Calculate fixed overhead variances :

(a) Expenditure Variance,

(b) Calendar Variance,

(c) Capacity Variance,

(d) Efficiency Variance,

(e) Volume Variance,

(f) Fixed Cost Variance.

Solution :

(a) Fixed Overhead Expenditure Variance

= Budgeted Fixed Overheads-Actual Fixed Overheads

= 1,50,000 – 1,56,000 = Rs. 6,000 (Adverse)

(b) Fixed Overhead Calendar Variance

= Decrease or Increase in number of units produced due to the difference of budgeted and actual days × standard Rate per unit

In increased 2 days, production will increase

= 6000 × 1 × 2 = 12,000 units

Standard Fixed Overhead Rate = $\frac{1,50,000}{6,000 \times 25} = \frac{1,50,000}{1,50,000}$ = Re. 1 per unit

Calendar Variance = 12,000 × 1 = Rs. 12,000 (Favourable)

(c) Fixed Overhead Capacity Variance

= Standard Rate (Revised Budgeted Units - Budgeted Units)

Budgeted units for 27 days = 6000 × 27 = 1,62,000

Revised Budgeted Units for 27 days = 6300 × 27 = 1,70,100

Capacity Variance = 1 (1,70,100 – 1,62,00)

= 1(8,100) = Rs. 8100 (Favourable)

(d) Fixed Overhead Efficiency Variance

= Standard Rate (Actual Quantity -Standard Quantity)

Standard Quantity :

Budgeted Production (in units) = 1,50,000

Increase due to increase in capacity = 8,100

Increase due to calendar variance = 12.000

1,70.100

Actual Quantity = 6300 × 27 × 0.9 = 1,53,090 units

Efficiency variance = 1 (1,53,090 – 1,70,100)

= 1 (–17,010) = Rs. 17,010 (Adverse)

(e) Fixed Overhead Volume Variance

= (Actual Output × Standard Rate) – (Budgeted Fixed Overheads)

(1,53090 × 1) – (1,50,000) = Rs. 3,090 Favourable

(f) Fixed Overhead Cost Variance

= Actual Output × Standard Rate – Actual Fixed Overheads

= (1,53,090 × 1) – (1,56,000)

= Rs. 2,910 (Adverse)

Verification :

(i) Fixed Overhead Cost Variance = Expenditure Variance + Volume Variance

2,910 (Adverse) = 6000 (Adverse) + 3,090 (Favourable)

2910(A) = 2910(A)

(ii) Volume Variance = Capacity Variance + Calendar Variance + Efficiency Variance

3,090 (Favourable) = 8,100(F) + 12,000 (F) + 17,010 (A)

3,090 (F) = 3,090 (F)

5.17.4 Sales / Profit Variances

The variances discussed in earlier pages related to the cost of goods manufactured. The impact of different variances, favourable and unfavourable, cost from materials, labour and overheads side has been studied. In addition, the study of sales variance is also important. The analysis of sales variances is important to study profit variances.

A sales value variance reveals the difference between actual sales and budgeted sales. This variance may arise due to change in sales price, sales volume or sales mix. Sales variances may be classified as follows:

a) Sales Value Variance

b) Sales Price Variance

c) Sales Volume Variance

d) Sales Mix Variance.

a) Sales Value Variance. A Sales Value Variance is the difference between budgeted sales and actual sales. It is calculated as :

Sales Value Variance = Actual Value of Sales- Budgeted Value of Sales.

If actual sales are more than the budgeted sales, the variance will be favourable and on the other hand, the variance will be unfavourable if actual sales are less than the budgeted sales.

b) Sales Price Variance. A sales price variance is that portion of sales value variance which arises due to the difference between the standard price specified and the actual price charged. It is calculated as :

Sales Price Variance = Actual Quantity (Actual Price - Standard Price).

c) Sales Volume Variance. It is that part of sales value variance which is due to the difference between actual quantity of sales and budgeted quantity of sales. It is calculated as :

Sales Volume Variance = Standard Price (Actual Quantity of Sales – Standard Quantity of Sales).

d) Sales Mix Variance. It is a sub-variance of sales volume variance. The proportion in which different quantities were budgeted may be different from the proportion of actual quantities sold. It is the difference of standard value of revised mix and standard value of actual mix.

Example 1

The budget and actual sales for a period in respect of two products are as follows :

Product	Quantity (Units)	Budgeted Price (Rs.)	Value (Rs.)	Quantity (units)	Actual Price (Rs.)	Value (Rs.)
X	600	3	17800	800	4	3,200
Y	800	4	3,200	600	3	1,800

Calculate Sales Variances.

Solution :

i) Sales Value Variance = Actual Value of Sales-Standard Value of Sales

Total Actual Value = 3,200 + 1,800 = 5,000

Total Standard Value = 1,800 + 3,200 = 5,000

Sales Value Variance = 5,000-5,000 = Nil

ii) Sales Price Variance = Actual Quantity Sold (Actual Price - Standard Price)

Product A 800 (4 - 3) = 800 Favourable

Product B 600 (3-4) = 600 Unfavourable

Sales Price Variance = 200 Favourable

iii) Sales Volume Variance = Standard Price (Actual Units - Standard Units)

Product A 3 (800 - 600) = 600 Favourable

Product B 4(600-800) = 800 Unfavourable

Sales Volume Variance = 200 Unfavourable.

Verification:

Sales Value Variance = Sales Price Variance + Sales Volume Variance

0 = 200 + (- 200)

0 = 0

Example 2

The information regarding budgeted and actual sales of two products has been given as follows :

Quantity	Sales Price (units)	Quantity (Rs.)	Sales Price (units)	Sales Price (Rs.)
Product A	800	10	1,000	12
Product B	1,200	6	1,400	5

Find out variances.

Solution :

i) Sales Value Variance = Actual Value of Sales – Standard Value of Sales

Actual Values of Sales :

Product A	= 1000 × 12	12000
Product B	= 1400 × 5	7000
Total	=	19000

Standard Value of Sales :

Product A	= 800 × 10	8000
Product B	= 1200 × 6	7200
Total	=	15200
Sales Value Variance	= 19000 – 15,200	3800 Favourable

ii) Sales Volume Variance = Actual Quantity Sold (Actual Price – Standard Price)

Product A	= 1000 (12 – 10)			
	= 1000 (2)	=	2000	Favorable
Product B	= 1400 (5–6)			
	= 1400 (–1)	=	1400	Unfavorable
Sales Price Variance	=		600	Favorable

iii) Sales Volume Variance = Standard Price (Actual units sold – Standard units)

Product A	= 10(1000 – 800)		
	= 10 (200)	2000	Favorable
Product B	= 6 (1400 – 1200)		
	= 6 (200)	1200	Favorable
Sales Volume Variance	=	3200	Favorable

iv) Sales Mix Variance :

There is a difference between standard quantity and actual quanity, so the standard will be revised in proportion to actual quantity of sales.

Revised Standard :

Product A $= \frac{800}{2000} \times 2400 = 960$ Units

Product B $= \frac{1200}{2000} \times 2400 = 1440$ Units

Sales Mix Variance = Standard Value of Actual Mix – Standard Value of Revised Standard Mix

Standard Value of Actual Mix :

Product A	= 10 × 1000 =	10,000
Product B	= 6 × 1400 =	8400
Total	=	18,400

Standard Value of Revised Standard Mix :

Product A	= 10 × 960 =	9,600
Product B	= 6 × 1440 =	8,640
Total	=	18,240

Sales Mix Variance = 18,400 – 18,240 = 160 Favorable

Verification :

Sales Value Variance = Sales Price Variance + Sales Volume Variance

3,800 (Fav.) = 600(Fav.) + 3,200 (Fav.)

3,800 (Fav.) = 3,800 (Fav.)

Profit Method of Calculating Sales Variances

In this method the effect of change in sales quantities and sales prices on the profits of the concern is determined. A businessman may be interested more in knowing variations in profits than in sales, profit method of calculating sales variances will be useful. The variances are analysed as follows :

a) Total Sales Margin Variance = Actual Profit - Budgeted Profit. Actual Profit = Actual quantity sold × Actual profit per unit. Budgeted Profit = Budgeted quantity of Sales × Budgeted profit per unit.

b) Sales Margin Variance due to Selling Price. This variance arises due to the difference between actual selling price and standard selling price. This variance is calculated as :

= Actual Quantity (Actual Price – Standard Price)

c) Sales Margin Variance due to Volume. This Variance arises due to the difference between actual quantity of sales and budgeted quantity of sales. It is calculated as :

Standard Profit per Unit (Actual Quantity of Sales - Standard Quantity of Sales).

Example 3

Standard Manufactures Ltd., has given the following budgeted and actual sales figures.

	Budgeted		Actual	
	Quantity	Sale Price Rs.	Quantity	Sale Price Rs.
Product A	500	60	600	65
Product B	700	40	650	38

The cost per unit of product A and B was Rs. 55 and Rs. 32 respectively. Compute variances to explain difference between budgeted and actual profit.

Solution :

i) Total Sales Margin Variance = Actual Profit - Budgeted Profit

Or (Actual Quantity x Actual Profit per Unit) - ((Budgeted Quantity x Budgeted Profit per Unit)

Actual Profit per Unit = Actual Sales Price - Actual Cost

Product A = 65 - 55 = 10

Product B = 38 - 32 = 6

Budgeted Profit per Unit = Budgeted Sale Price — Actual Cost

Product A = 60 – 55 = 5

Product B = 40 – 32 = 8

Actual Profit

Product A	= 600 x 10 =	6,000
Product B	= 650. x 6 =	3,900
		9,900

Budgeted Profit

Product A	= 500 x 5 =	2,500
Product B	= 700 x 8 =	5,600
		8,100
Sales Margin Variance	= 9,900 – 8,100 =	1,800 Favourable

ii) Sales Margin Variance due to Selling Price :

= Actual Quantity (Actual Price – Standard Price)

Product A = 600 (65 – 60)

= 600 (5) – 3000 Favorable

Product B = 650 (38 – 40)

= 650 (–2) – 1300 Unfavorable

Sales Margin Variance due to Selling price = 1700 Favorable

iii) Sales Margin Variance due to Volume = Standard Profit per unit (Actual Quantity – Standard quantity)

Product A = 5 (600 – 500)

= 5 (100) = 500 Favorable

Product B = 8 (650 – 700)

= 8 (–50) = 400 Unfavourable

Sales Margin Variance due to Volume = Rs. 100 Favorable

Verification :

Total Sales Margin Variance = Sales Margin Variance due to Selling Price + Sales Margin Variance due to Volume

1,800 (Fav.) = 1,700 (Fav.) + 100 (Fav.)

1,800 (Fav.) = 1,800 (Fav.)

SHORT NOTES

1. Budget

A budget is the monetary or/and quantitative expression of business plans and policies to be pursued in the future period of time. The term budgeting is used for preparing budgets and other procedures for planning, co-ordination and control of business enterprise.

2. Budgeting

Budgeting is a business process in which senior executives and department heads set spending limits and cost thresholds for each business unit. At the end of each month or quarter, segment managers compare actual data with budget amounts and make adjustments.

3. Budgetary Control

Budgetary control is the process of determining various budgeted figures for the enterprises for the future period and then comparing the budgeted figures with the actual performance for calculating variances, if any. First of all budgets are prepared and then actual results are recorded. The comparison of budgeted and actual figures will enable the management to find out discrepancies and take remedial measures at a proper time. The budgetary control is a continuous process which helps in planning and co-ordination. It provides a method of control too. A budget is a means and budgetary control is the end-result.

4. Budget Centre

A budget center is that part of the organization for which the budget is prepared. A budget center may be a department, section of a department, or any other part of the department. Ideally, the head of every center should be a member of the Budget Committee. However, it must be ensured that each budget center at least has an indirect representation in the Budget Committee. The establishment of budget centers is essential for covering all parts of the organization becomes easy when different centers are established. The budget centers are also necessary for cost control purposes.

5. Budget Committee

A budget committee is formed to assist the Budget Officer. The Budget Officer acts as coordinator of this committee. The heads of all the important departments are made members of this committee. The committee is responsible for preparation and execution of budgets. The members of this committee put up the case of their respective departments and help the committee to take collective decisions, if necessary. The budget committee is responsible for reviewing the budgets prepared by various functional heads.

6. Budget Manual

A budget manual is a document that spells out the duties and responsibilities of the various executives concerned with it specialties among various functional areas.

7. Budget Period

A budget is always related to specified time period. The budget period is the length of time for which a budget is prepared and employed. The period may depend upon the type of budget. There is no specific period as such. However, for the sake of convenience, the budget period may be fixed depending upon the following factors.

(a) Types of Business

(b) Types of Budget

(c) Nature of the demand of the product

(d) Length of trade cycle

(e) Economic factors

(f) Availability of accounting period

(g) Availability of finance

(h) Control operation

8. Key Factor

Key Factor is also called as "Limiting Factor" or Governing Factor. While preparing the budget it is necessary to consider the key factor for successful budgetary control. The influence of the Key Factor which dominates the business operations in order to ensure that the functional budgets are reasonably capable of fulfillment.

9. Production Budget

Production budget is prepared after the preparation of sales budget, to determine quality of goods which should be produced to meet the budget sales .It is expressed in physical terms, such as

(a) Union of output

(b) Labour of house

(c) Material requirement.

10. Cash Budget

The cash budget is a summary of the firms expected cash inflows and outflows over a particular period of time .In other word, cash budget involves of a projection of future cash receipts and cash disbursements over various time intervals. There must be a balance between cash and the cash demanding activities.

11. The Master budget

The institute of cost and management accountings England, defines it as the Summery Budget, incorporating its component functional budgets, which is finally approved, adopted and employed. In other words, it is a summery budget which is prepared from and summarizes all the functional budget.

12. Zero-Base Budgeting (ZBB)

The ZBB take account consequences that may flow if the project or responsibility centre is scratched. In other words, the objective of ZBB is to formulate the budget so as to estimate the amount of expenditure likely to be incurred if the existing project resumes operation after being scratched. This method is called Zero Base budgeting since the existing system is discontinued and a fresh is made or the existing system is reviewed on the assumption of Zero-Base.

13. Fixed Budgets

It is a budget in which targets are rigidly fixed. Accord ting to I.C.M.A. London. Fixed budget is a budget which to remain in changed irrespective of the level of activity actually attained. Such budgets are usually prepared from one to three months in advance of the fiscal year to which they are applicable.

14. Flexible Budget

Fixed budget is generally rigid as it is based on one level of activity and one set of condition and hence not quite helpful for control purpose. A flexible budget is therefore, designed to provide information as to sales, expenses and profits for different levels of activity which may be obtained.

15. Sales Budget

Sales budget is the most important budget and of primary importance. It forms the basis on which all the other budgets are built up. This budget is a forecast of quantities and values of sales to be achieved in a budget period. Every effort should be made to ensure that its figure is as accurate as possible because this is usually the starting budget.

16. Standard Costing

Standard costing is an important subtopic of cost accounting. Standard costs are usually associated with a manufacturing company's costs of direct material, direct labour, and manufacturing overhead.

17. Variance Analysis

Variance Analysis is the process of analyzing variances by sub-dividing the total variance in such a way that the management can assign responsibility for standard performance. It is a continuous process. It must be followed by intelligence and actual interpretation.

Analysis of variances involves the segregation of total cost variances into different elements in such a way as to indicate or locate clearly the causes of such variances and persons held responsible for them.

FACULTY OF MANAGEMENT

BBA (Regular) III – Year Examination

Model Paper

MANAGEMENT ACCOUNTING

Time : 3 Hours | Max. Marks : 70

Note : Answer all questions.

PART – A (10 x 2 = 20 Marks)

[Short Answer Type]

1. Answer the following in not more than 75 words.
   - (a) Concept of cost
   - (b) Cost sheet
   - (c) Management Accounting
   - (d) Cost Accounting
   - (e) Liquidity Ratios
   - (f) Turnover Ratios
   - (g) P/V Ratio
   - (h) Break even point
   - (i) Budget Manual
   - (j) Standard Costing

PART – B (5 x 10 = 50 Marks)

[Essay Answer Type]

2. (a) What is Cost Accounting? Discuss briefly its important functions in a business firm.

   OR

   (b) Explain the method of preparation of a cost sheet and its contents.

3. (a) Explain the nature, scope and objectives of Management Accounting.

   OR

(b) Describe the relationship between Financial Accounting and Management Accounting.

4. (a) The following are the ratios relating to the activities of National Traders Ltd.

Debtors velocity	3 months
Stock velocity	8 months
Creditors velocity	2 months
Gross profit ratio	25%

Gross profit for the current year ended 31st December amounts to Rs. 4,00,000. Closing stock of the year is Rs. 10,000 more than the opening stock. Bills receivable amounts to Rs. 25,000 and Bills payable to Rs. 10,000. Find out: (i) Sales (b) Sundry debtors (c) Closing Stock (d) Sundry creditors.

OR

(b) Explain the classification of Ratios.

5. (a) From the following particulars calculate

(i) Contribution per unit

(ii) P/V Ratio

(iii) Break even point in units

(iv) What will be the selling price per unit, if the break even point is brought down to 10,000 units:

Selling price per unit	Rs. 20
Variable cost per unit	Rs. 16
Fixed expenses	Rs. 60,000

OR

(b) Explain the advantages and limitations of marginal costing.

6. (a) Explain the objectives, characteristics and essentials of Budgetary Control.

OR

(b) From the following particulars calculate

(i) Total Material cost variance

(ii) Material Price variance

(iii) Material Usage Variance

Materials	Standard		Actual	
	Units	Price (Rs.)	Units	Price (Rs.)
A	1010	1.00	1080	1.20
B	410	1.50	380	1.80
C	350	2.00	380	1.90

FACULTY OF MANAGEMENT

BBA - III - Year Examination

MANAGEMENT ACCOUNTING

Time : 3 Hours] **ANSWERS TO MARCH / APRIL - 2017** [Max. Marks : 75

Note : Answer all the questions.

PART - A (10 × 2 = 20 Marks) **ANSWERS**

1. Write short notes on the following at one place only.

a) Historical Cost.

Ans :

Historical cost is a measure of a value used in accounting in which the price of an aset on balance sheet is based on its nominal or original cost when acquired by the company. The historical cost method is used for assets in the United States under Generally Accepted Accounting Principles (GAAP). Example, Land and Building.

b) Notional Cost.

Ans :

Notional costs and opportunity costs are two important concepts in cost and management accounting as they have for reaching effects on decisions making process. But both are distinct and under standing the features of each type of cost is vital as it has important implications from decision making perspective.

c) Process costing. **(Unit-III, Page No. 81, Q.6)**

d) Joint and By Product costing

Ans :

Joint Costing

Joint costs are the costs that are incurred from buying or producing two products at the source time in cost accounting terms joint costs have source cost objects. For example , shipping costs. This include product cost and advertisement cost.

By Product Costing

It refers to the costs used to create a product. These costs include direct labour, direct materials, consumable production supplies and factory overhead. Product cost can also be considered the cost of the labour requred to deliver a service to a customer in the letter case, product cost should include all costs related to a service, such as compensation, payroll taxes and benefits for employee etc.

e) Debt Euqity Ratio. **[Unit-III, Page No. 93, Topic-3.2.2 (a)]**

f) Inventory turnover ratio

Ans :

The inventory turnover ratio is calculated by dividing the cost of goods sold for a period by the average inventory for that period. Average inventory is used instead of ending inventory because many companies merchandise fluctuations throughout the year.

g) Break even point. **(Unit-IV, Page No. 192, Topic-4.9)**

h) Margin of Safety. **(Unit-IV, Page No. 203, Topic-4.11)**

i) Fixed Vs Variable budget. **(Unit-V, Page No. 242, Topic-C 1, 2)**

j) Material variance. **(Unit-V, Page No. 261, Topic-5.17.1)**

PART - B (5 × 10 = 50 Marks)

2. a) Explain the concept of cost and its classification **(Unit-I, Page No.16, Topic-1.5)**

OR

b) From the following information prepare cost sheet

	Rs.
Direct material	1,60,000
Direct labour	45,000
Direct expenses	15,000
Factory overheads	35,000
Office and administration overheads 20% of works cost	
Selling and distribution over heads	45,000
Closing stock of finished goods	25,000
Profit on sales 10%	10,000

Ans :

Statement of Cost

	Direct Material	1,60,000
	Direct Labour	45,000
	Direct expenses	15,000
a)	Prime cost	2,20,000
	Add : Factory overhead	35,000
b)	Work cost or factory cost	2,55,000
	Add : Office and admn overhead (20% of work cost)	51,000
c)	Cost of production	3,06,000
	Add : opening stock of finished goods	25,000
		3,31,000
	Less : Closing stock of finished goods	10,000
d)	Cost of goods sold	3,21,000
	Add : Selling and distribution overhead	45,000
e)	Cost of sales	3,66,000
	Profit on sales 10%	36,600
	SALES	4,02,600

3. a) Explain the nature and scope of management accounting

Nature of Management A/c. **(Unit-II, Page No. 48, Topic.2.1.3)**

Scope of Management A/c. **(Unit-II, Page No. 50, Topic.2.1.4)**

OR

b) Describe the methods and systems of costing. **(Unit-II, Page No. 64, Topic.2.7.1)**

4. a) Describe the advantages and limitations of ratio analysis

Advantages. **(Unit-III, Page No. 87, Topic.3.1.5)**

Limitations. **(Unit-III, Page No. 90, Topic.3.1.6)**

OR

b) Excepts from Ramakrishnan inc.'s 2008 and 2009 balance sheets is listed below (in millions of rupees.

Current assets	2008 Rs	2009 Rs	Current liabilities	2008 Rs	2009 Rs
Cash and marketable securities	15	20	Accrued wages and taxes	18	19
Accounts receivable	75	84	Accounts payable	45	51
Inventory	110	121	Notes payable	40	45
Total	200	225	Total	103	115

Solution

i) Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

For 2008 Current Ratio = $\frac{200}{103}$ = 1.94

For 2009 Current Ratio = $\frac{225}{115}$ = 1.95

ii) Quick Ratio = $\frac{\text{Quick assets}}{\text{Current liabilities}}$

Quick Assets = Total current Assets – Inventory – prepaid expenses

(Ignore prepaid expenses it is not given)

Quick Ratio for 2008 = $\frac{200-110}{103}$ = 0.87

For 2009 Quick Ratio = $\frac{225-121}{115}$ = 0.90

iii) Cash Ratio = (cash + cash equivalent) / Total current liabilities

For 2008 cash Ratio = $\frac{15}{103}$ = 0.145

For 2009 cash Ratio = $\frac{20}{115}$ = 0.173

5. a) Describe the advantages and limitations of marginal costing **(Unit-IV, Page No. 216,218, Topic.4.14 & 4.15)**

OR

b) Whittier Company plans to sell 1,000 movers at Rs. 400 each in the coming year Product costs include:

Direct materials per movers Rs. 180. Direct labour per mower 100

Variable factory over head per mower 25. total fixed factory overhead 15,000

Variable selling expenses is a commission of Rs. 20 per mover. fixed selling and administrative expense total Rs. 30,000

Required

1. Calculate the total variable cost per unit

2. Calculate the tiotal fixed expense for the year

3. Calculate the number of mowers that Whittier Company must sell to break even

Ans :

1. Variable Cost

Variable cost = Total Quantity of output $\times$ Variable cost per unit of output

Given : Direct materials per mower = Rs. 180

Direct labour per mower = Rs. 100

Variable selling expense of commission per mower = Rs. 20

$$VC = 1000\left(\frac{180}{1000}+\frac{100}{1000}+\frac{20}{1000}+\frac{25}{1000}\right)$$

$= 305$

$\Rightarrow$ Variable cost = ` 305

2. Fixed Cost

Given total fixed factory overhead = Rs. 15,000

Fixed selling and administrative expenses = Rs. 30,000

Fixed cost = 15,000 + 30,000 = Rs. 45,000

3. Break Even Analysis (BEP)

No. of mower that Whittier company must sell to break even

$$\text{BEP (in units)} = \frac{FC(\text{Fixed Cost})}{C(\text{Contribution})}$$

C = Selling Price (S.P) – Variable Cost (VC)

$$\text{BEP (in units)} = \frac{FC}{SP-VC} = \frac{45,000}{400-305} = 473.68$$

---

6. a) Explain the essentials of budgetary control **(Unit-V, Page No.229, Topic-5.2)**

OR

b) The Schlosser Lawn Furniture company uses 12 meters of aluminum pipe at Rs. 0.80 per meter as standard for the production of its Type A lawn chair. During one month's operations. 1,00,000 meters of the pipe were purchased at Rs. 0.78 a meter and 7,200 chairs were produced using 87,300 meters of pipe. The materials recognized when materials are purchased. Calculate Materials Cost, price and quantity variances.

Ans :

i) Material cost variance = Standard Material Cost – Actual material cost

= (87,300 $\times$ 0.80) – (1,00,000 $\times$ 0.78)

= 69,840 – 78,000

= 8,160 unfavourable

ii) Material Price Variance = Actual quantity (standard price – Actual price)

= 1,00,000 (0.78 – 0.80)

= 1,00,000 $\times$ 0.20

= 2,000 unfavourable

iii) Material usage variance = Standard Price (Standard quantity – Actual quantity)

= 0.80 (87,300 – 1,00,000)

= 10,160 unfavourable

FACULTY OF MANAGEMENT

BBA - III - Year Examination

MANAGEMENT ACCOUNTING

Time : 3 Hours] **ANSWERS TO MARCH / APRIL - 2017** [Max. Marks : 75

Note : Answer all the questions.

PART - A (10 × 2 = 20 Marks) **ANSWERS**

1. Write short notes on the following at one place only.

a) Historical Cost.

Ans :

Historical cost is a measure of a value used in accounting in which the price of an aset on balance sheet is based on its nominal or original cost when acquired by the company. The historical cost method is used for assets in the United States under Generally Accepted Accounting Principles (GAAP). Example, Land and Building.

b) Notional Cost.

Ans :

Notional costs and opportunity costs are two important concepts in cost and management accounting as they have for reaching effects on decisions making process. But both are distinct and under standing the features of each type of cost is vital as it has important implications from decision making perspective.

c) Process costing. **(Unit-III, Page No. 81, Q.6)**

d) Joint and By Product costing

Ans :

Joint Costing

Joint costs are the costs that are incurred from buying or producing two products at the source time in cost accounting terms joint costs have source cost objects. For example , shipping costs. This include product cost and advertisement cost.

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It refers to the costs used to create a product. These costs include direct labour, direct materials, consumable production supplies and factory overhead. Product cost can also be considered the cost of the labour requred to deliver a service to a customer in the letter case, product cost should include all costs related to a service, such as compensation, payroll taxes and benefits for employee etc.

e) Debt Euqity Ratio. **[Unit-III, Page No. 93, Topic-3.2.2 (a)]**

f) Inventory turnover ratio

Ans :

The inventory turnover ratio is calculated by dividing the cost of goods sold for a period by the average inventory for that period. Average inventory is used instead of ending inventory because many companies merchandise fluctuations throughout the year.

g) Break even point. **(Unit-IV, Page No. 192, Topic-4.9)**

h) Margin of Safety. **(Unit-IV, Page No. 203, Topic-4.11)**

i) Fixed Vs Variable budget. **(Unit-V, Page No. 242, Topic-C 1, 2)**

j) Material variance. **(Unit-V, Page No. 261, Topic-5.17.1)**

PART - B (5 × 10 = 50 Marks)

2. a) Explain the concept of cost and its classification **(Unit-I, Page No.16, Topic-1.5)**

OR

b) From the following information prepare cost sheet

	Rs.
Direct material	1,60,000
Direct labour	45,000
Direct expenses	15,000
Factory overheads	35,000
Office and administration overheads 20% of works cost	
Selling and distribution over heads	45,000
Closing stock of finished goods	25,000
Profit on sales 10%	10,000

Ans :

Statement of Cost

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	Direct Labour	45,000
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a)	Prime cost	2,20,000
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	Add : opening stock of finished goods	25,000
		3,31,000
	Less : Closing stock of finished goods	10,000
d)	Cost of goods sold	3,21,000
	Add : Selling and distribution overhead	45,000
e)	Cost of sales	3,66,000
	Profit on sales 10%	36,600
	SALES	4,02,600

3. a) Explain the nature and scope of management accounting

Nature of Management A/c. **(Unit-II, Page No. 48, Topic.2.1.3)**

Scope of Management A/c. **(Unit-II, Page No. 50, Topic.2.1.4)**

OR

b) Describe the methods and systems of costing. **(Unit-II, Page No. 64, Topic.2.7.1)**

4. a) Describe the advantages and limitations of ratio analysis

Advantages. **(Unit-III, Page No. 87, Topic.3.1.5)**

Limitations. **(Unit-III, Page No. 90, Topic.3.1.6)**

OR

b) Excepts from Ramakrishnan inc.'s 2008 and 2009 balance sheets is listed below (in millions of rupees.

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5. a) Describe the advantages and limitations of marginal costing **(Unit-IV, Page No. 216,218, Topic.4.14 & 4.15)**

OR

b) Whittier Company plans to sell 1,000 movers at Rs. 400 each in the coming year Product costs include:

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Required

1. Calculate the total variable cost per unit

2. Calculate the tiotal fixed expense for the year

3. Calculate the number of mowers that Whittier Company must sell to break even

Ans :

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Variable cost = Total Quantity of output $\times$ Variable cost per unit of output

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$$VC = 1000\left(\frac{180}{1000}+\frac{100}{1000}+\frac{20}{1000}+\frac{25}{1000}\right)$$

$= 305$

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Fixed cost = 15,000 + 30,000 = Rs. 45,000

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No. of mower that Whittier company must sell to break even

$$\text{BEP (in units)} = \frac{FC(\text{Fixed Cost})}{C(\text{Contribution})}$$

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FACULTY OF MANAGEMENT

BBA - III - Year Examination

MANAGEMENT ACCOUNTING

Time : 3 Hours] **ANSWERS TO MARCH / APRIL - 2017** [Max. Marks : 75

Note : Answer all the questions.

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PART - B (5 × 10 = 50 Marks)

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Given total fixed factory overhead = Rs. 15,000

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Fixed cost = 15,000 + 30,000 = Rs. 45,000

3. Break Even Analysis (BEP)

No. of mower that Whittier company must sell to break even

$$\text{BEP (in units)} = \frac{FC(\text{Fixed Cost})}{C(\text{Contribution})}$$

C = Selling Price (S.P) – Variable Cost (VC)

$$\text{BEP (in units)} = \frac{FC}{SP-VC} = \frac{45,000}{400-305} = 473.68$$

---

6. a) Explain the essentials of budgetary control **(Unit-V, Page No.229, Topic-5.2)**

OR

b) The Schlosser Lawn Furniture company uses 12 meters of aluminum pipe at Rs. 0.80 per meter as standard for the production of its Type A lawn chair. During one month's operations. 1,00,000 meters of the pipe were purchased at Rs. 0.78 a meter and 7,200 chairs were produced using 87,300 meters of pipe. The materials recognized when materials are purchased. Calculate Materials Cost, price and quantity variances.

Ans :

i) Material cost variance = Standard Material Cost – Actual material cost

= (87,300 $\times$ 0.80) – (1,00,000 $\times$ 0.78)

= 69,840 – 78,000

= 8,160 unfavourable

ii) Material Price Variance = Actual quantity (standard price – Actual price)

= 1,00,000 (0.78 – 0.80)

= 1,00,000 $\times$ 0.20

= 2,000 unfavourable

iii) Material usage variance = Standard Price (Standard quantity – Actual quantity)

= 0.80 (87,300 – 1,00,000)

= 10,160 unfavourable

FACULTY OF MANAGEMENT

BBA - III - Year Examination

MANAGEMENT ACCOUNTING

Time : 3 Hours] **ANSWERS TO MARCH / APRIL - 2017** [Max. Marks : 75

Note : Answer all the questions.

PART - A (10 × 2 = 20 Marks) **ANSWERS**

1. Write short notes on the following at one place only.

a) Historical Cost.

Ans :

Historical cost is a measure of a value used in accounting in which the price of an aset on balance sheet is based on its nominal or original cost when acquired by the company. The historical cost method is used for assets in the United States under Generally Accepted Accounting Principles (GAAP). Example, Land and Building.

b) Notional Cost.

Ans :

Notional costs and opportunity costs are two important concepts in cost and management accounting as they have for reaching effects on decisions making process. But both are distinct and under standing the features of each type of cost is vital as it has important implications from decision making perspective.

c) Process costing. **(Unit-III, Page No. 81, Q.6)**

d) Joint and By Product costing

Ans :

Joint Costing

Joint costs are the costs that are incurred from buying or producing two products at the source time in cost accounting terms joint costs have source cost objects. For example , shipping costs. This include product cost and advertisement cost.

By Product Costing

It refers to the costs used to create a product. These costs include direct labour, direct materials, consumable production supplies and factory overhead. Product cost can also be considered the cost of the labour requred to deliver a service to a customer in the letter case, product cost should include all costs related to a service, such as compensation, payroll taxes and benefits for employee etc.

e) Debt Euqity Ratio. **[Unit-III, Page No. 93, Topic-3.2.2 (a)]**

f) Inventory turnover ratio

Ans :

The inventory turnover ratio is calculated by dividing the cost of goods sold for a period by the average inventory for that period. Average inventory is used instead of ending inventory because many companies merchandise fluctuations throughout the year.

g) Break even point. **(Unit-IV, Page No. 192, Topic-4.9)**

h) Margin of Safety. **(Unit-IV, Page No. 203, Topic-4.11)**

i) Fixed Vs Variable budget. **(Unit-V, Page No. 242, Topic-C 1, 2)**

j) Material variance. **(Unit-V, Page No. 261, Topic-5.17.1)**

PART - B (5 × 10 = 50 Marks)

2. a) Explain the concept of cost and its classification **(Unit-I, Page No.16, Topic-1.5)**

OR

b) From the following information prepare cost sheet

	Rs.
Direct material	1,60,000
Direct labour	45,000
Direct expenses	15,000
Factory overheads	35,000
Office and administration overheads 20% of works cost	
Selling and distribution over heads	45,000
Closing stock of finished goods	25,000
Profit on sales 10%	10,000

Ans :

Statement of Cost

	Direct Material	1,60,000
	Direct Labour	45,000
	Direct expenses	15,000
a)	Prime cost	2,20,000
	Add : Factory overhead	35,000
b)	Work cost or factory cost	2,55,000
	Add : Office and admn overhead (20% of work cost)	51,000
c)	Cost of production	3,06,000
	Add : opening stock of finished goods	25,000
		3,31,000
	Less : Closing stock of finished goods	10,000
d)	Cost of goods sold	3,21,000
	Add : Selling and distribution overhead	45,000
e)	Cost of sales	3,66,000
	Profit on sales 10%	36,600
	SALES	4,02,600

3. a) Explain the nature and scope of management accounting

Nature of Management A/c. **(Unit-II, Page No. 48, Topic.2.1.3)**

Scope of Management A/c. **(Unit-II, Page No. 50, Topic.2.1.4)**

OR

b) Describe the methods and systems of costing. **(Unit-II, Page No. 64, Topic.2.7.1)**

4. a) Describe the advantages and limitations of ratio analysis

Advantages. **(Unit-III, Page No. 87, Topic.3.1.5)**

Limitations. **(Unit-III, Page No. 90, Topic.3.1.6)**

OR

b) Excepts from Ramakrishnan inc.'s 2008 and 2009 balance sheets is listed below (in millions of rupees.

Current assets	2008 Rs	2009 Rs	Current liabilities	2008 Rs	2009 Rs
Cash and marketable securities	15	20	Accrued wages and taxes	18	19
Accounts receivable	75	84	Accounts payable	45	51
Inventory	110	121	Notes payable	40	45
Total	200	225	Total	103	115

Solution

i) Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

For 2008 Current Ratio = $\frac{200}{103}$ = 1.94

For 2009 Current Ratio = $\frac{225}{115}$ = 1.95

ii) Quick Ratio = $\frac{\text{Quick assets}}{\text{Current liabilities}}$

Quick Assets = Total current Assets – Inventory – prepaid expenses

(Ignore prepaid expenses it is not given)

Quick Ratio for 2008 = $\frac{200-110}{103}$ = 0.87

For 2009 Quick Ratio = $\frac{225-121}{115}$ = 0.90

iii) Cash Ratio = (cash + cash equivalent) / Total current liabilities

For 2008 cash Ratio = $\frac{15}{103}$ = 0.145

For 2009 cash Ratio = $\frac{20}{115}$ = 0.173

5. a) Describe the advantages and limitations of marginal costing **(Unit-IV, Page No. 216,218, Topic.4.14 & 4.15)**

OR

b) Whittier Company plans to sell 1,000 movers at Rs. 400 each in the coming year Product costs include:

Direct materials per movers Rs. 180. Direct labour per mower 100

Variable factory over head per mower 25. total fixed factory overhead 15,000

Variable selling expenses is a commission of Rs. 20 per mover. fixed selling and administrative expense total Rs. 30,000

Required

1. Calculate the total variable cost per unit

2. Calculate the tiotal fixed expense for the year

3. Calculate the number of mowers that Whittier Company must sell to break even

Ans :

1. Variable Cost

Variable cost = Total Quantity of output $\times$ Variable cost per unit of output

Given : Direct materials per mower = Rs. 180

Direct labour per mower = Rs. 100

Variable selling expense of commission per mower = Rs. 20

$$VC = 1000\left(\frac{180}{1000}+\frac{100}{1000}+\frac{20}{1000}+\frac{25}{1000}\right)$$

$= 305$

$\Rightarrow$ Variable cost = ` 305

2. Fixed Cost

Given total fixed factory overhead = Rs. 15,000

Fixed selling and administrative expenses = Rs. 30,000

Fixed cost = 15,000 + 30,000 = Rs. 45,000

3. Break Even Analysis (BEP)

No. of mower that Whittier company must sell to break even

$$\text{BEP (in units)} = \frac{FC(\text{Fixed Cost})}{C(\text{Contribution})}$$

C = Selling Price (S.P) – Variable Cost (VC)

$$\text{BEP (in units)} = \frac{FC}{SP-VC} = \frac{45,000}{400-305} = 473.68$$

---

6. a) Explain the essentials of budgetary control **(Unit-V, Page No.229, Topic-5.2)**

OR

b) The Schlosser Lawn Furniture company uses 12 meters of aluminum pipe at Rs. 0.80 per meter as standard for the production of its Type A lawn chair. During one month's operations. 1,00,000 meters of the pipe were purchased at Rs. 0.78 a meter and 7,200 chairs were produced using 87,300 meters of pipe. The materials recognized when materials are purchased. Calculate Materials Cost, price and quantity variances.

Ans :

i) Material cost variance = Standard Material Cost – Actual material cost

= (87,300 $\times$ 0.80) – (1,00,000 $\times$ 0.78)

= 69,840 – 78,000

= 8,160 unfavourable

ii) Material Price Variance = Actual quantity (standard price – Actual price)

= 1,00,000 (0.78 – 0.80)

= 1,00,000 $\times$ 0.20

= 2,000 unfavourable

iii) Material usage variance = Standard Price (Standard quantity – Actual quantity)

= 0.80 (87,300 – 1,00,000)

= 10,160 unfavourable

FACULTY OF MANAGEMENT

BBA - III - Year Examination

MANAGEMENT ACCOUNTING

Time : 3 Hours] **ANSWERS TO MARCH / APRIL - 2017** [Max. Marks : 75

Note : Answer all the questions.

PART - A (10 × 2 = 20 Marks) **ANSWERS**

1. Write short notes on the following at one place only.

a) Historical Cost.

Ans :

Historical cost is a measure of a value used in accounting in which the price of an aset on balance sheet is based on its nominal or original cost when acquired by the company. The historical cost method is used for assets in the United States under Generally Accepted Accounting Principles (GAAP). Example, Land and Building.

b) Notional Cost.

Ans :

Notional costs and opportunity costs are two important concepts in cost and management accounting as they have for reaching effects on decisions making process. But both are distinct and under standing the features of each type of cost is vital as it has important implications from decision making perspective.

c) Process costing. **(Unit-III, Page No. 81, Q.6)**

d) Joint and By Product costing

Ans :

Joint Costing

Joint costs are the costs that are incurred from buying or producing two products at the source time in cost accounting terms joint costs have source cost objects. For example , shipping costs. This include product cost and advertisement cost.

By Product Costing

It refers to the costs used to create a product. These costs include direct labour, direct materials, consumable production supplies and factory overhead. Product cost can also be considered the cost of the labour requred to deliver a service to a customer in the letter case, product cost should include all costs related to a service, such as compensation, payroll taxes and benefits for employee etc.

e) Debt Euqity Ratio. **[Unit-III, Page No. 93, Topic-3.2.2 (a)]**

f) Inventory turnover ratio

Ans :

The inventory turnover ratio is calculated by dividing the cost of goods sold for a period by the average inventory for that period. Average inventory is used instead of ending inventory because many companies merchandise fluctuations throughout the year.

g) Break even point. **(Unit-IV, Page No. 192, Topic-4.9)**

h) Margin of Safety. **(Unit-IV, Page No. 203, Topic-4.11)**

i) Fixed Vs Variable budget. **(Unit-V, Page No. 242, Topic-C 1, 2)**

j) Material variance. **(Unit-V, Page No. 261, Topic-5.17.1)**

PART - B (5 × 10 = 50 Marks)

2. a) Explain the concept of cost and its classification **(Unit-I, Page No.16, Topic-1.5)**

OR

b) From the following information prepare cost sheet

	Rs.
Direct material	1,60,000
Direct labour	45,000
Direct expenses	15,000
Factory overheads	35,000
Office and administration overheads 20% of works cost	
Selling and distribution over heads	45,000
Closing stock of finished goods	25,000
Profit on sales 10%	10,000

Ans :

Statement of Cost

	Direct Material	1,60,000
	Direct Labour	45,000
	Direct expenses	15,000
a)	Prime cost	2,20,000
	Add : Factory overhead	35,000
b)	Work cost or factory cost	2,55,000
	Add : Office and admn overhead (20% of work cost)	51,000
c)	Cost of production	3,06,000
	Add : opening stock of finished goods	25,000
		3,31,000
	Less : Closing stock of finished goods	10,000
d)	Cost of goods sold	3,21,000
	Add : Selling and distribution overhead	45,000
e)	Cost of sales	3,66,000
	Profit on sales 10%	36,600
	SALES	4,02,600

3. a) Explain the nature and scope of management accounting

Nature of Management A/c. **(Unit-II, Page No. 48, Topic.2.1.3)**

Scope of Management A/c. **(Unit-II, Page No. 50, Topic.2.1.4)**

OR

b) Describe the methods and systems of costing. **(Unit-II, Page No. 64, Topic.2.7.1)**

4. a) Describe the advantages and limitations of ratio analysis

Advantages. **(Unit-III, Page No. 87, Topic.3.1.5)**

Limitations. **(Unit-III, Page No. 90, Topic.3.1.6)**

OR

b) Excepts from Ramakrishnan inc.'s 2008 and 2009 balance sheets is listed below (in millions of rupees.

Current assets	2008 Rs	2009 Rs	Current liabilities	2008 Rs	2009 Rs
Cash and marketable securities	15	20	Accrued wages and taxes	18	19
Accounts receivable	75	84	Accounts payable	45	51
Inventory	110	121	Notes payable	40	45
Total	200	225	Total	103	115

Solution

i) Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

For 2008 Current Ratio = $\frac{200}{103}$ = 1.94

For 2009 Current Ratio = $\frac{225}{115}$ = 1.95

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Quick Assets = Total current Assets – Inventory – prepaid expenses

(Ignore prepaid expenses it is not given)

Quick Ratio for 2008 = $\frac{200-110}{103}$ = 0.87

For 2009 Quick Ratio = $\frac{225-121}{115}$ = 0.90

iii) Cash Ratio = (cash + cash equivalent) / Total current liabilities

For 2008 cash Ratio = $\frac{15}{103}$ = 0.145

For 2009 cash Ratio = $\frac{20}{115}$ = 0.173

5. a) Describe the advantages and limitations of marginal costing **(Unit-IV, Page No. 216,218, Topic.4.14 & 4.15)**

OR

b) Whittier Company plans to sell 1,000 movers at Rs. 400 each in the coming year Product costs include:

Direct materials per movers Rs. 180. Direct labour per mower 100

Variable factory over head per mower 25. total fixed factory overhead 15,000

Variable selling expenses is a commission of Rs. 20 per mover. fixed selling and administrative expense total Rs. 30,000

Required

1. Calculate the total variable cost per unit

2. Calculate the tiotal fixed expense for the year

3. Calculate the number of mowers that Whittier Company must sell to break even

Ans :

1. Variable Cost

Variable cost = Total Quantity of output $\times$ Variable cost per unit of output

Given : Direct materials per mower = Rs. 180

Direct labour per mower = Rs. 100

Variable selling expense of commission per mower = Rs. 20

$$VC = 1000\left(\frac{180}{1000}+\frac{100}{1000}+\frac{20}{1000}+\frac{25}{1000}\right)$$

$= 305$

$\Rightarrow$ Variable cost = ` 305

2. Fixed Cost

Given total fixed factory overhead = Rs. 15,000

Fixed selling and administrative expenses = Rs. 30,000

Fixed cost = 15,000 + 30,000 = Rs. 45,000

3. Break Even Analysis (BEP)

No. of mower that Whittier company must sell to break even

$$\text{BEP (in units)} = \frac{FC(\text{Fixed Cost})}{C(\text{Contribution})}$$

C = Selling Price (S.P) – Variable Cost (VC)

$$\text{BEP (in units)} = \frac{FC}{SP-VC} = \frac{45,000}{400-305} = 473.68$$

---

6. a) Explain the essentials of budgetary control **(Unit-V, Page No.229, Topic-5.2)**

OR

b) The Schlosser Lawn Furniture company uses 12 meters of aluminum pipe at Rs. 0.80 per meter as standard for the production of its Type A lawn chair. During one month's operations. 1,00,000 meters of the pipe were purchased at Rs. 0.78 a meter and 7,200 chairs were produced using 87,300 meters of pipe. The materials recognized when materials are purchased. Calculate Materials Cost, price and quantity variances.

Ans :

i) Material cost variance = Standard Material Cost – Actual material cost

= (87,300 $\times$ 0.80) – (1,00,000 $\times$ 0.78)

= 69,840 – 78,000

= 8,160 unfavourable

ii) Material Price Variance = Actual quantity (standard price – Actual price)

= 1,00,000 (0.78 – 0.80)

= 1,00,000 $\times$ 0.20

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iii) Material usage variance = Standard Price (Standard quantity – Actual quantity)

= 0.80 (87,300 – 1,00,000)

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FACULTY OF MANAGEMENT

BBA - III - Year Examination

MANAGEMENT ACCOUNTING

Time : 3 Hours] **ANSWERS TO MARCH / APRIL - 2017** [Max. Marks : 75

Note : Answer all the questions.

PART - A (10 × 2 = 20 Marks) **ANSWERS**

1. Write short notes on the following at one place only.

a) Historical Cost.

Ans :

Historical cost is a measure of a value used in accounting in which the price of an aset on balance sheet is based on its nominal or original cost when acquired by the company. The historical cost method is used for assets in the United States under Generally Accepted Accounting Principles (GAAP). Example, Land and Building.

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Ans :

Notional costs and opportunity costs are two important concepts in cost and management accounting as they have for reaching effects on decisions making process. But both are distinct and under standing the features of each type of cost is vital as it has important implications from decision making perspective.

c) Process costing. **(Unit-III, Page No. 81, Q.6)**

d) Joint and By Product costing

Ans :

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Joint costs are the costs that are incurred from buying or producing two products at the source time in cost accounting terms joint costs have source cost objects. For example , shipping costs. This include product cost and advertisement cost.

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e) Debt Euqity Ratio. **[Unit-III, Page No. 93, Topic-3.2.2 (a)]**

f) Inventory turnover ratio

Ans :

The inventory turnover ratio is calculated by dividing the cost of goods sold for a period by the average inventory for that period. Average inventory is used instead of ending inventory because many companies merchandise fluctuations throughout the year.

g) Break even point. **(Unit-IV, Page No. 192, Topic-4.9)**

h) Margin of Safety. **(Unit-IV, Page No. 203, Topic-4.11)**

i) Fixed Vs Variable budget. **(Unit-V, Page No. 242, Topic-C 1, 2)**

j) Material variance. **(Unit-V, Page No. 261, Topic-5.17.1)**

PART - B (5 × 10 = 50 Marks)

2. a) Explain the concept of cost and its classification **(Unit-I, Page No.16, Topic-1.5)**

OR

b) From the following information prepare cost sheet

	Rs.
Direct material	1,60,000
Direct labour	45,000
Direct expenses	15,000
Factory overheads	35,000
Office and administration overheads 20% of works cost	
Selling and distribution over heads	45,000
Closing stock of finished goods	25,000
Profit on sales 10%	10,000

Ans :

Statement of Cost

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a)	Prime cost	2,20,000
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d)	Cost of goods sold	3,21,000
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e)	Cost of sales	3,66,000
	Profit on sales 10%	36,600
	SALES	4,02,600

3. a) Explain the nature and scope of management accounting

Nature of Management A/c. **(Unit-II, Page No. 48, Topic.2.1.3)**

Scope of Management A/c. **(Unit-II, Page No. 50, Topic.2.1.4)**

OR

b) Describe the methods and systems of costing. **(Unit-II, Page No. 64, Topic.2.7.1)**

4. a) Describe the advantages and limitations of ratio analysis

Advantages. **(Unit-III, Page No. 87, Topic.3.1.5)**

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5. a) Describe the advantages and limitations of marginal costing **(Unit-IV, Page No. 216,218, Topic.4.14 & 4.15)**

OR

b) Whittier Company plans to sell 1,000 movers at Rs. 400 each in the coming year Product costs include:

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1. Calculate the total variable cost per unit

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Ans :

1. Variable Cost

Variable cost = Total Quantity of output $\times$ Variable cost per unit of output

Given : Direct materials per mower = Rs. 180

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$$VC = 1000\left(\frac{180}{1000}+\frac{100}{1000}+\frac{20}{1000}+\frac{25}{1000}\right)$$

$= 305$

$\Rightarrow$ Variable cost = ` 305

2. Fixed Cost

Given total fixed factory overhead = Rs. 15,000

Fixed selling and administrative expenses = Rs. 30,000

Fixed cost = 15,000 + 30,000 = Rs. 45,000

3. Break Even Analysis (BEP)

No. of mower that Whittier company must sell to break even

$$\text{BEP (in units)} = \frac{FC(\text{Fixed Cost})}{C(\text{Contribution})}$$

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6. a) Explain the essentials of budgetary control **(Unit-V, Page No.229, Topic-5.2)**

OR

b) The Schlosser Lawn Furniture company uses 12 meters of aluminum pipe at Rs. 0.80 per meter as standard for the production of its Type A lawn chair. During one month's operations. 1,00,000 meters of the pipe were purchased at Rs. 0.78 a meter and 7,200 chairs were produced using 87,300 meters of pipe. The materials recognized when materials are purchased. Calculate Materials Cost, price and quantity variances.

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= 1,00,000 $\times$ 0.20

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FACULTY OF MANAGEMENT

BBA - III - Year Examination

MANAGEMENT ACCOUNTING

Time : 3 Hours] **ANSWERS TO MARCH / APRIL - 2017** [Max. Marks : 75

Note : Answer all the questions.

PART - A (10 × 2 = 20 Marks) **ANSWERS**

1. Write short notes on the following at one place only.

a) Historical Cost.

Ans :

Historical cost is a measure of a value used in accounting in which the price of an aset on balance sheet is based on its nominal or original cost when acquired by the company. The historical cost method is used for assets in the United States under Generally Accepted Accounting Principles (GAAP). Example, Land and Building.

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Ans :

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e) Debt Euqity Ratio. **[Unit-III, Page No. 93, Topic-3.2.2 (a)]**

f) Inventory turnover ratio

Ans :

The inventory turnover ratio is calculated by dividing the cost of goods sold for a period by the average inventory for that period. Average inventory is used instead of ending inventory because many companies merchandise fluctuations throughout the year.

g) Break even point. **(Unit-IV, Page No. 192, Topic-4.9)**

h) Margin of Safety. **(Unit-IV, Page No. 203, Topic-4.11)**

i) Fixed Vs Variable budget. **(Unit-V, Page No. 242, Topic-C 1, 2)**

j) Material variance. **(Unit-V, Page No. 261, Topic-5.17.1)**

PART - B (5 × 10 = 50 Marks)

2. a) Explain the concept of cost and its classification **(Unit-I, Page No.16, Topic-1.5)**

OR

b) From the following information prepare cost sheet

	Rs.
Direct material	1,60,000
Direct labour	45,000
Direct expenses	15,000
Factory overheads	35,000
Office and administration overheads 20% of works cost	
Selling and distribution over heads	45,000
Closing stock of finished goods	25,000
Profit on sales 10%	10,000

Ans :

Statement of Cost

	Direct Material	1,60,000
	Direct Labour	45,000
	Direct expenses	15,000
a)	Prime cost	2,20,000
	Add : Factory overhead	35,000
b)	Work cost or factory cost	2,55,000
	Add : Office and admn overhead (20% of work cost)	51,000
c)	Cost of production	3,06,000
	Add : opening stock of finished goods	25,000
		3,31,000
	Less : Closing stock of finished goods	10,000
d)	Cost of goods sold	3,21,000
	Add : Selling and distribution overhead	45,000
e)	Cost of sales	3,66,000
	Profit on sales 10%	36,600
	SALES	4,02,600

3. a) Explain the nature and scope of management accounting

Nature of Management A/c. **(Unit-II, Page No. 48, Topic.2.1.3)**

Scope of Management A/c. **(Unit-II, Page No. 50, Topic.2.1.4)**

OR

b) Describe the methods and systems of costing. **(Unit-II, Page No. 64, Topic.2.7.1)**

4. a) Describe the advantages and limitations of ratio analysis

Advantages. **(Unit-III, Page No. 87, Topic.3.1.5)**

Limitations. **(Unit-III, Page No. 90, Topic.3.1.6)**

OR

b) Excepts from Ramakrishnan inc.'s 2008 and 2009 balance sheets is listed below (in millions of rupees.

Current assets	2008 Rs	2009 Rs	Current liabilities	2008 Rs	2009 Rs
Cash and marketable securities	15	20	Accrued wages and taxes	18	19
Accounts receivable	75	84	Accounts payable	45	51
Inventory	110	121	Notes payable	40	45
Total	200	225	Total	103	115

Solution

i) Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

For 2008 Current Ratio = $\frac{200}{103}$ = 1.94

For 2009 Current Ratio = $\frac{225}{115}$ = 1.95

ii) Quick Ratio = $\frac{\text{Quick assets}}{\text{Current liabilities}}$

Quick Assets = Total current Assets – Inventory – prepaid expenses

(Ignore prepaid expenses it is not given)

Quick Ratio for 2008 = $\frac{200-110}{103}$ = 0.87

For 2009 Quick Ratio = $\frac{225-121}{115}$ = 0.90

iii) Cash Ratio = (cash + cash equivalent) / Total current liabilities

For 2008 cash Ratio = $\frac{15}{103}$ = 0.145

For 2009 cash Ratio = $\frac{20}{115}$ = 0.173

5. a) Describe the advantages and limitations of marginal costing **(Unit-IV, Page No. 216,218, Topic.4.14 & 4.15)**

OR

b) Whittier Company plans to sell 1,000 movers at Rs. 400 each in the coming year Product costs include:

Direct materials per movers Rs. 180. Direct labour per mower 100

Variable factory over head per mower 25. total fixed factory overhead 15,000

Variable selling expenses is a commission of Rs. 20 per mover. fixed selling and administrative expense total Rs. 30,000

Required

1. Calculate the total variable cost per unit

2. Calculate the tiotal fixed expense for the year

3. Calculate the number of mowers that Whittier Company must sell to break even

Ans :

1. Variable Cost

Variable cost = Total Quantity of output $\times$ Variable cost per unit of output

Given : Direct materials per mower = Rs. 180

Direct labour per mower = Rs. 100

Variable selling expense of commission per mower = Rs. 20

$$VC = 1000\left(\frac{180}{1000}+\frac{100}{1000}+\frac{20}{1000}+\frac{25}{1000}\right)$$

$= 305$

$\Rightarrow$ Variable cost = ` 305

2. Fixed Cost

Given total fixed factory overhead = Rs. 15,000

Fixed selling and administrative expenses = Rs. 30,000

Fixed cost = 15,000 + 30,000 = Rs. 45,000

3. Break Even Analysis (BEP)

No. of mower that Whittier company must sell to break even

$$\text{BEP (in units)} = \frac{FC(\text{Fixed Cost})}{C(\text{Contribution})}$$

C = Selling Price (S.P) – Variable Cost (VC)

$$\text{BEP (in units)} = \frac{FC}{SP-VC} = \frac{45,000}{400-305} = 473.68$$

---

6. a) Explain the essentials of budgetary control **(Unit-V, Page No.229, Topic-5.2)**

OR

b) The Schlosser Lawn Furniture company uses 12 meters of aluminum pipe at Rs. 0.80 per meter as standard for the production of its Type A lawn chair. During one month's operations. 1,00,000 meters of the pipe were purchased at Rs. 0.78 a meter and 7,200 chairs were produced using 87,300 meters of pipe. The materials recognized when materials are purchased. Calculate Materials Cost, price and quantity variances.

Ans :

i) Material cost variance = Standard Material Cost – Actual material cost

= (87,300 $\times$ 0.80) – (1,00,000 $\times$ 0.78)

= 69,840 – 78,000

= 8,160 unfavourable

ii) Material Price Variance = Actual quantity (standard price – Actual price)

= 1,00,000 (0.78 – 0.80)

= 1,00,000 $\times$ 0.20

= 2,000 unfavourable

iii) Material usage variance = Standard Price (Standard quantity – Actual quantity)

= 0.80 (87,300 – 1,00,000)

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FACULTY OF MANAGEMENT

BBA - III - Year Examination

MANAGEMENT ACCOUNTING

Time : 3 Hours] **ANSWERS TO MARCH / APRIL - 2017** [Max. Marks : 75

Note : Answer all the questions.

PART - A (10 × 2 = 20 Marks) **ANSWERS**

1. Write short notes on the following at one place only.

a) Historical Cost.

Ans :

Historical cost is a measure of a value used in accounting in which the price of an aset on balance sheet is based on its nominal or original cost when acquired by the company. The historical cost method is used for assets in the United States under Generally Accepted Accounting Principles (GAAP). Example, Land and Building.

b) Notional Cost.

Ans :

Notional costs and opportunity costs are two important concepts in cost and management accounting as they have for reaching effects on decisions making process. But both are distinct and under standing the features of each type of cost is vital as it has important implications from decision making perspective.

c) Process costing. **(Unit-III, Page No. 81, Q.6)**

d) Joint and By Product costing

Ans :

Joint Costing

Joint costs are the costs that are incurred from buying or producing two products at the source time in cost accounting terms joint costs have source cost objects. For example , shipping costs. This include product cost and advertisement cost.

By Product Costing

It refers to the costs used to create a product. These costs include direct labour, direct materials, consumable production supplies and factory overhead. Product cost can also be considered the cost of the labour requred to deliver a service to a customer in the letter case, product cost should include all costs related to a service, such as compensation, payroll taxes and benefits for employee etc.

e) Debt Euqity Ratio. **[Unit-III, Page No. 93, Topic-3.2.2 (a)]**

f) Inventory turnover ratio

Ans :

The inventory turnover ratio is calculated by dividing the cost of goods sold for a period by the average inventory for that period. Average inventory is used instead of ending inventory because many companies merchandise fluctuations throughout the year.

g) Break even point. **(Unit-IV, Page No. 192, Topic-4.9)**

h) Margin of Safety. **(Unit-IV, Page No. 203, Topic-4.11)**

i) Fixed Vs Variable budget. **(Unit-V, Page No. 242, Topic-C 1, 2)**

j) Material variance. **(Unit-V, Page No. 261, Topic-5.17.1)**

PART - B (5 × 10 = 50 Marks)

2. a) Explain the concept of cost and its classification **(Unit-I, Page No.16, Topic-1.5)**

OR

b) From the following information prepare cost sheet

	Rs.
Direct material	1,60,000
Direct labour	45,000
Direct expenses	15,000
Factory overheads	35,000
Office and administration overheads 20% of works cost	
Selling and distribution over heads	45,000
Closing stock of finished goods	25,000
Profit on sales 10%	10,000

Ans :

Statement of Cost

	Direct Material	1,60,000
	Direct Labour	45,000
	Direct expenses	15,000
a)	Prime cost	2,20,000
	Add : Factory overhead	35,000
b)	Work cost or factory cost	2,55,000
	Add : Office and admn overhead (20% of work cost)	51,000
c)	Cost of production	3,06,000
	Add : opening stock of finished goods	25,000
		3,31,000
	Less : Closing stock of finished goods	10,000
d)	Cost of goods sold	3,21,000
	Add : Selling and distribution overhead	45,000
e)	Cost of sales	3,66,000
	Profit on sales 10%	36,600
	SALES	4,02,600

3. a) Explain the nature and scope of management accounting

Nature of Management A/c. **(Unit-II, Page No. 48, Topic.2.1.3)**

Scope of Management A/c. **(Unit-II, Page No. 50, Topic.2.1.4)**

OR

b) Describe the methods and systems of costing. **(Unit-II, Page No. 64, Topic.2.7.1)**

4. a) Describe the advantages and limitations of ratio analysis

Advantages. **(Unit-III, Page No. 87, Topic.3.1.5)**

Limitations. **(Unit-III, Page No. 90, Topic.3.1.6)**

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b) Excepts from Ramakrishnan inc.'s 2008 and 2009 balance sheets is listed below (in millions of rupees.

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Cash and marketable securities	15	20	Accrued wages and taxes	18	19
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Solution

i) Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

For 2008 Current Ratio = $\frac{200}{103}$ = 1.94

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For 2008 cash Ratio = $\frac{15}{103}$ = 0.145

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5. a) Describe the advantages and limitations of marginal costing **(Unit-IV, Page No. 216,218, Topic.4.14 & 4.15)**

OR

b) Whittier Company plans to sell 1,000 movers at Rs. 400 each in the coming year Product costs include:

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Required

1. Calculate the total variable cost per unit

2. Calculate the tiotal fixed expense for the year

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Ans :

1. Variable Cost

Variable cost = Total Quantity of output $\times$ Variable cost per unit of output

Given : Direct materials per mower = Rs. 180

Direct labour per mower = Rs. 100

Variable selling expense of commission per mower = Rs. 20

$$VC = 1000\left(\frac{180}{1000}+\frac{100}{1000}+\frac{20}{1000}+\frac{25}{1000}\right)$$

$= 305$

$\Rightarrow$ Variable cost = ` 305

2. Fixed Cost

Given total fixed factory overhead = Rs. 15,000

Fixed selling and administrative expenses = Rs. 30,000

Fixed cost = 15,000 + 30,000 = Rs. 45,000

3. Break Even Analysis (BEP)

No. of mower that Whittier company must sell to break even

$$\text{BEP (in units)} = \frac{FC(\text{Fixed Cost})}{C(\text{Contribution})}$$

C = Selling Price (S.P) – Variable Cost (VC)

$$\text{BEP (in units)} = \frac{FC}{SP-VC} = \frac{45,000}{400-305} = 473.68$$

---

6. a) Explain the essentials of budgetary control **(Unit-V, Page No.229, Topic-5.2)**

OR

b) The Schlosser Lawn Furniture company uses 12 meters of aluminum pipe at Rs. 0.80 per meter as standard for the production of its Type A lawn chair. During one month's operations. 1,00,000 meters of the pipe were purchased at Rs. 0.78 a meter and 7,200 chairs were produced using 87,300 meters of pipe. The materials recognized when materials are purchased. Calculate Materials Cost, price and quantity variances.

Ans :

i) Material cost variance = Standard Material Cost – Actual material cost

= (87,300 $\times$ 0.80) – (1,00,000 $\times$ 0.78)

= 69,840 – 78,000

= 8,160 unfavourable

ii) Material Price Variance = Actual quantity (standard price – Actual price)

= 1,00,000 (0.78 – 0.80)

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= 0.80 (87,300 – 1,00,000)

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FACULTY OF MANAGEMENT

BBA - III - Year Examination

MANAGEMENT ACCOUNTING

Time : 3 Hours] **ANSWERS TO MARCH / APRIL - 2017** [Max. Marks : 75

Note : Answer all the questions.

PART - A (10 × 2 = 20 Marks) **ANSWERS**

1. Write short notes on the following at one place only.

a) Historical Cost.

Ans :

Historical cost is a measure of a value used in accounting in which the price of an aset on balance sheet is based on its nominal or original cost when acquired by the company. The historical cost method is used for assets in the United States under Generally Accepted Accounting Principles (GAAP). Example, Land and Building.

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Ans :

Notional costs and opportunity costs are two important concepts in cost and management accounting as they have for reaching effects on decisions making process. But both are distinct and under standing the features of each type of cost is vital as it has important implications from decision making perspective.

c) Process costing. **(Unit-III, Page No. 81, Q.6)**

d) Joint and By Product costing

Ans :

Joint Costing

Joint costs are the costs that are incurred from buying or producing two products at the source time in cost accounting terms joint costs have source cost objects. For example , shipping costs. This include product cost and advertisement cost.

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It refers to the costs used to create a product. These costs include direct labour, direct materials, consumable production supplies and factory overhead. Product cost can also be considered the cost of the labour requred to deliver a service to a customer in the letter case, product cost should include all costs related to a service, such as compensation, payroll taxes and benefits for employee etc.

e) Debt Euqity Ratio. **[Unit-III, Page No. 93, Topic-3.2.2 (a)]**

f) Inventory turnover ratio

Ans :

The inventory turnover ratio is calculated by dividing the cost of goods sold for a period by the average inventory for that period. Average inventory is used instead of ending inventory because many companies merchandise fluctuations throughout the year.

g) Break even point. **(Unit-IV, Page No. 192, Topic-4.9)**

h) Margin of Safety. **(Unit-IV, Page No. 203, Topic-4.11)**

i) Fixed Vs Variable budget. **(Unit-V, Page No. 242, Topic-C 1, 2)**

j) Material variance. **(Unit-V, Page No. 261, Topic-5.17.1)**

PART - B (5 × 10 = 50 Marks)

2. a) Explain the concept of cost and its classification **(Unit-I, Page No.16, Topic-1.5)**

OR

b) From the following information prepare cost sheet

	Rs.
Direct material	1,60,000
Direct labour	45,000
Direct expenses	15,000
Factory overheads	35,000
Office and administration overheads 20% of works cost	
Selling and distribution over heads	45,000
Closing stock of finished goods	25,000
Profit on sales 10%	10,000

Ans :

Statement of Cost

	Direct Material	1,60,000
	Direct Labour	45,000
	Direct expenses	15,000
a)	Prime cost	2,20,000
	Add : Factory overhead	35,000
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	Add : Office and admn overhead (20% of work cost)	51,000
c)	Cost of production	3,06,000
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	Less : Closing stock of finished goods	10,000
d)	Cost of goods sold	3,21,000
	Add : Selling and distribution overhead	45,000
e)	Cost of sales	3,66,000
	Profit on sales 10%	36,600
	SALES	4,02,600

3. a) Explain the nature and scope of management accounting

Nature of Management A/c. **(Unit-II, Page No. 48, Topic.2.1.3)**

Scope of Management A/c. **(Unit-II, Page No. 50, Topic.2.1.4)**

OR

b) Describe the methods and systems of costing. **(Unit-II, Page No. 64, Topic.2.7.1)**

4. a) Describe the advantages and limitations of ratio analysis

Advantages. **(Unit-III, Page No. 87, Topic.3.1.5)**

Limitations. **(Unit-III, Page No. 90, Topic.3.1.6)**

OR

b) Excepts from Ramakrishnan inc.'s 2008 and 2009 balance sheets is listed below (in millions of rupees.

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Cash and marketable securities	15	20	Accrued wages and taxes	18	19
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Solution

i) Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

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For 2008 cash Ratio = $\frac{15}{103}$ = 0.145

For 2009 cash Ratio = $\frac{20}{115}$ = 0.173

5. a) Describe the advantages and limitations of marginal costing **(Unit-IV, Page No. 216,218, Topic.4.14 & 4.15)**

OR

b) Whittier Company plans to sell 1,000 movers at Rs. 400 each in the coming year Product costs include:

Direct materials per movers Rs. 180. Direct labour per mower 100

Variable factory over head per mower 25. total fixed factory overhead 15,000

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Required

1. Calculate the total variable cost per unit

2. Calculate the tiotal fixed expense for the year

3. Calculate the number of mowers that Whittier Company must sell to break even

Ans :

1. Variable Cost

Variable cost = Total Quantity of output $\times$ Variable cost per unit of output

Given : Direct materials per mower = Rs. 180

Direct labour per mower = Rs. 100

Variable selling expense of commission per mower = Rs. 20

$$VC = 1000\left(\frac{180}{1000}+\frac{100}{1000}+\frac{20}{1000}+\frac{25}{1000}\right)$$

$= 305$

$\Rightarrow$ Variable cost = ` 305

2. Fixed Cost

Given total fixed factory overhead = Rs. 15,000

Fixed selling and administrative expenses = Rs. 30,000

Fixed cost = 15,000 + 30,000 = Rs. 45,000

3. Break Even Analysis (BEP)

No. of mower that Whittier company must sell to break even

$$\text{BEP (in units)} = \frac{FC(\text{Fixed Cost})}{C(\text{Contribution})}$$

C = Selling Price (S.P) – Variable Cost (VC)

$$\text{BEP (in units)} = \frac{FC}{SP-VC} = \frac{45,000}{400-305} = 473.68$$

---

6. a) Explain the essentials of budgetary control **(Unit-V, Page No.229, Topic-5.2)**

OR

b) The Schlosser Lawn Furniture company uses 12 meters of aluminum pipe at Rs. 0.80 per meter as standard for the production of its Type A lawn chair. During one month's operations. 1,00,000 meters of the pipe were purchased at Rs. 0.78 a meter and 7,200 chairs were produced using 87,300 meters of pipe. The materials recognized when materials are purchased. Calculate Materials Cost, price and quantity variances.

Ans :

i) Material cost variance = Standard Material Cost – Actual material cost

= (87,300 $\times$ 0.80) – (1,00,000 $\times$ 0.78)

= 69,840 – 78,000

= 8,160 unfavourable

ii) Material Price Variance = Actual quantity (standard price – Actual price)

= 1,00,000 (0.78 – 0.80)

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FACULTY OF MANAGEMENT

BBA - III - Year Examination

MANAGEMENT ACCOUNTING

Time : 3 Hours] **ANSWERS TO MARCH / APRIL - 2017** [Max. Marks : 75

Note : Answer all the questions.

PART - A (10 × 2 = 20 Marks) **ANSWERS**

1. Write short notes on the following at one place only.

a) Historical Cost.

Ans :

Historical cost is a measure of a value used in accounting in which the price of an aset on balance sheet is based on its nominal or original cost when acquired by the company. The historical cost method is used for assets in the United States under Generally Accepted Accounting Principles (GAAP). Example, Land and Building.

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Notional costs and opportunity costs are two important concepts in cost and management accounting as they have for reaching effects on decisions making process. But both are distinct and under standing the features of each type of cost is vital as it has important implications from decision making perspective.

c) Process costing. **(Unit-III, Page No. 81, Q.6)**

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Ans :

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f) Inventory turnover ratio

Ans :

The inventory turnover ratio is calculated by dividing the cost of goods sold for a period by the average inventory for that period. Average inventory is used instead of ending inventory because many companies merchandise fluctuations throughout the year.

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PART - B (5 × 10 = 50 Marks)

2. a) Explain the concept of cost and its classification **(Unit-I, Page No.16, Topic-1.5)**

OR

b) From the following information prepare cost sheet

	Rs.
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	Profit on sales 10%	36,600
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3. a) Explain the nature and scope of management accounting

Nature of Management A/c. **(Unit-II, Page No. 48, Topic.2.1.3)**

Scope of Management A/c. **(Unit-II, Page No. 50, Topic.2.1.4)**

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$$VC = 1000\left(\frac{180}{1000}+\frac{100}{1000}+\frac{20}{1000}+\frac{25}{1000}\right)$$

$= 305$

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2. Fixed Cost

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Fixed cost = 15,000 + 30,000 = Rs. 45,000

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$$\text{BEP (in units)} = \frac{FC(\text{Fixed Cost})}{C(\text{Contribution})}$$

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$$\text{BEP (in units)} = \frac{FC}{SP-VC} = \frac{45,000}{400-305} = 473.68$$

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6. a) Explain the essentials of budgetary control **(Unit-V, Page No.229, Topic-5.2)**

OR

b) The Schlosser Lawn Furniture company uses 12 meters of aluminum pipe at Rs. 0.80 per meter as standard for the production of its Type A lawn chair. During one month's operations. 1,00,000 meters of the pipe were purchased at Rs. 0.78 a meter and 7,200 chairs were produced using 87,300 meters of pipe. The materials recognized when materials are purchased. Calculate Materials Cost, price and quantity variances.

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= 1,00,000 $\times$ 0.20

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FACULTY OF MANAGEMENT

BBA - III - Year Examination

MANAGEMENT ACCOUNTING

Time : 3 Hours] **ANSWERS TO MARCH / APRIL - 2017** [Max. Marks : 75

Note : Answer all the questions.

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1. Write short notes on the following at one place only.

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d) Joint and By Product costing

Ans :

Joint Costing

Joint costs are the costs that are incurred from buying or producing two products at the source time in cost accounting terms joint costs have source cost objects. For example , shipping costs. This include product cost and advertisement cost.

By Product Costing

It refers to the costs used to create a product. These costs include direct labour, direct materials, consumable production supplies and factory overhead. Product cost can also be considered the cost of the labour requred to deliver a service to a customer in the letter case, product cost should include all costs related to a service, such as compensation, payroll taxes and benefits for employee etc.

e) Debt Euqity Ratio. **[Unit-III, Page No. 93, Topic-3.2.2 (a)]**

f) Inventory turnover ratio

Ans :

The inventory turnover ratio is calculated by dividing the cost of goods sold for a period by the average inventory for that period. Average inventory is used instead of ending inventory because many companies merchandise fluctuations throughout the year.

g) Break even point. **(Unit-IV, Page No. 192, Topic-4.9)**

h) Margin of Safety. **(Unit-IV, Page No. 203, Topic-4.11)**

i) Fixed Vs Variable budget. **(Unit-V, Page No. 242, Topic-C 1, 2)**

j) Material variance. **(Unit-V, Page No. 261, Topic-5.17.1)**

PART - B (5 × 10 = 50 Marks)

2. a) Explain the concept of cost and its classification **(Unit-I, Page No.16, Topic-1.5)**

OR

b) From the following information prepare cost sheet

	Rs.
Direct material	1,60,000
Direct labour	45,000
Direct expenses	15,000
Factory overheads	35,000
Office and administration overheads 20% of works cost	
Selling and distribution over heads	45,000
Closing stock of finished goods	25,000
Profit on sales 10%	10,000

Ans :

Statement of Cost

	Direct Material	1,60,000
	Direct Labour	45,000
	Direct expenses	15,000
a)	Prime cost	2,20,000
	Add : Factory overhead	35,000
b)	Work cost or factory cost	2,55,000
	Add : Office and admn overhead (20% of work cost)	51,000
c)	Cost of production	3,06,000
	Add : opening stock of finished goods	25,000
		3,31,000
	Less : Closing stock of finished goods	10,000
d)	Cost of goods sold	3,21,000
	Add : Selling and distribution overhead	45,000
e)	Cost of sales	3,66,000
	Profit on sales 10%	36,600
	SALES	4,02,600

3. a) Explain the nature and scope of management accounting

Nature of Management A/c. **(Unit-II, Page No. 48, Topic.2.1.3)**

Scope of Management A/c. **(Unit-II, Page No. 50, Topic.2.1.4)**

OR

b) Describe the methods and systems of costing. **(Unit-II, Page No. 64, Topic.2.7.1)**

4. a) Describe the advantages and limitations of ratio analysis

Advantages. **(Unit-III, Page No. 87, Topic.3.1.5)**

Limitations. **(Unit-III, Page No. 90, Topic.3.1.6)**

OR

b) Excepts from Ramakrishnan inc.'s 2008 and 2009 balance sheets is listed below (in millions of rupees.

Current assets	2008 Rs	2009 Rs	Current liabilities	2008 Rs	2009 Rs
Cash and marketable securities	15	20	Accrued wages and taxes	18	19
Accounts receivable	75	84	Accounts payable	45	51
Inventory	110	121	Notes payable	40	45
Total	200	225	Total	103	115

Solution

i) Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

For 2008 Current Ratio = $\frac{200}{103}$ = 1.94

For 2009 Current Ratio = $\frac{225}{115}$ = 1.95

ii) Quick Ratio = $\frac{\text{Quick assets}}{\text{Current liabilities}}$

Quick Assets = Total current Assets – Inventory – prepaid expenses

(Ignore prepaid expenses it is not given)

Quick Ratio for 2008 = $\frac{200-110}{103}$ = 0.87

For 2009 Quick Ratio = $\frac{225-121}{115}$ = 0.90

iii) Cash Ratio = (cash + cash equivalent) / Total current liabilities

For 2008 cash Ratio = $\frac{15}{103}$ = 0.145

For 2009 cash Ratio = $\frac{20}{115}$ = 0.173

5. a) Describe the advantages and limitations of marginal costing **(Unit-IV, Page No. 216,218, Topic.4.14 & 4.15)**

OR

b) Whittier Company plans to sell 1,000 movers at Rs. 400 each in the coming year Product costs include:

Direct materials per movers Rs. 180. Direct labour per mower 100

Variable factory over head per mower 25. total fixed factory overhead 15,000

Variable selling expenses is a commission of Rs. 20 per mover. fixed selling and administrative expense total Rs. 30,000

Required

1. Calculate the total variable cost per unit

2. Calculate the tiotal fixed expense for the year

3. Calculate the number of mowers that Whittier Company must sell to break even

Ans :

1. Variable Cost

Variable cost = Total Quantity of output $\times$ Variable cost per unit of output

Given : Direct materials per mower = Rs. 180

Direct labour per mower = Rs. 100

Variable selling expense of commission per mower = Rs. 20

$$VC = 1000\left(\frac{180}{1000}+\frac{100}{1000}+\frac{20}{1000}+\frac{25}{1000}\right)$$

$= 305$

$\Rightarrow$ Variable cost = ` 305

2. Fixed Cost

Given total fixed factory overhead = Rs. 15,000

Fixed selling and administrative expenses = Rs. 30,000

Fixed cost = 15,000 + 30,000 = Rs. 45,000

3. Break Even Analysis (BEP)

No. of mower that Whittier company must sell to break even

$$\text{BEP (in units)} = \frac{FC(\text{Fixed Cost})}{C(\text{Contribution})}$$

C = Selling Price (S.P) – Variable Cost (VC)

$$\text{BEP (in units)} = \frac{FC}{SP-VC} = \frac{45,000}{400-305} = 473.68$$

---

6. a) Explain the essentials of budgetary control **(Unit-V, Page No.229, Topic-5.2)**

OR

b) The Schlosser Lawn Furniture company uses 12 meters of aluminum pipe at Rs. 0.80 per meter as standard for the production of its Type A lawn chair. During one month's operations. 1,00,000 meters of the pipe were purchased at Rs. 0.78 a meter and 7,200 chairs were produced using 87,300 meters of pipe. The materials recognized when materials are purchased. Calculate Materials Cost, price and quantity variances.

Ans :

i) Material cost variance = Standard Material Cost – Actual material cost

= (87,300 $\times$ 0.80) – (1,00,000 $\times$ 0.78)

= 69,840 – 78,000

= 8,160 unfavourable

ii) Material Price Variance = Actual quantity (standard price – Actual price)

= 1,00,000 (0.78 – 0.80)

= 1,00,000 $\times$ 0.20

= 2,000 unfavourable

iii) Material usage variance = Standard Price (Standard quantity – Actual quantity)

= 0.80 (87,300 – 1,00,000)

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FACULTY OF MANAGEMENT

BBA - III - Year Examination

MANAGEMENT ACCOUNTING

Time : 3 Hours] **ANSWERS TO MARCH / APRIL - 2017** [Max. Marks : 75

Note : Answer all the questions.

PART - A (10 × 2 = 20 Marks) **ANSWERS**

1. Write short notes on the following at one place only.

a) Historical Cost.

Ans :

Historical cost is a measure of a value used in accounting in which the price of an aset on balance sheet is based on its nominal or original cost when acquired by the company. The historical cost method is used for assets in the United States under Generally Accepted Accounting Principles (GAAP). Example, Land and Building.

b) Notional Cost.

Ans :

Notional costs and opportunity costs are two important concepts in cost and management accounting as they have for reaching effects on decisions making process. But both are distinct and under standing the features of each type of cost is vital as it has important implications from decision making perspective.

c) Process costing. **(Unit-III, Page No. 81, Q.6)**

d) Joint and By Product costing

Ans :

Joint Costing

Joint costs are the costs that are incurred from buying or producing two products at the source time in cost accounting terms joint costs have source cost objects. For example , shipping costs. This include product cost and advertisement cost.

By Product Costing

It refers to the costs used to create a product. These costs include direct labour, direct materials, consumable production supplies and factory overhead. Product cost can also be considered the cost of the labour requred to deliver a service to a customer in the letter case, product cost should include all costs related to a service, such as compensation, payroll taxes and benefits for employee etc.

e) Debt Euqity Ratio. **[Unit-III, Page No. 93, Topic-3.2.2 (a)]**

f) Inventory turnover ratio

Ans :

The inventory turnover ratio is calculated by dividing the cost of goods sold for a period by the average inventory for that period. Average inventory is used instead of ending inventory because many companies merchandise fluctuations throughout the year.

g) Break even point. **(Unit-IV, Page No. 192, Topic-4.9)**

h) Margin of Safety. **(Unit-IV, Page No. 203, Topic-4.11)**

i) Fixed Vs Variable budget. **(Unit-V, Page No. 242, Topic-C 1, 2)**

j) Material variance. **(Unit-V, Page No. 261, Topic-5.17.1)**

PART - B (5 × 10 = 50 Marks)

2. a) Explain the concept of cost and its classification **(Unit-I, Page No.16, Topic-1.5)**

OR

b) From the following information prepare cost sheet

	Rs.
Direct material	1,60,000
Direct labour	45,000
Direct expenses	15,000
Factory overheads	35,000
Office and administration overheads 20% of works cost	
Selling and distribution over heads	45,000
Closing stock of finished goods	25,000
Profit on sales 10%	10,000

Ans :

Statement of Cost

	Direct Material	1,60,000
	Direct Labour	45,000
	Direct expenses	15,000
a)	Prime cost	2,20,000
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	Less : Closing stock of finished goods	10,000
d)	Cost of goods sold	3,21,000
	Add : Selling and distribution overhead	45,000
e)	Cost of sales	3,66,000
	Profit on sales 10%	36,600
	SALES	4,02,600

3. a) Explain the nature and scope of management accounting

Nature of Management A/c. **(Unit-II, Page No. 48, Topic.2.1.3)**

Scope of Management A/c. **(Unit-II, Page No. 50, Topic.2.1.4)**

OR

b) Describe the methods and systems of costing. **(Unit-II, Page No. 64, Topic.2.7.1)**

4. a) Describe the advantages and limitations of ratio analysis

Advantages. **(Unit-III, Page No. 87, Topic.3.1.5)**

Limitations. **(Unit-III, Page No. 90, Topic.3.1.6)**

OR

b) Excepts from Ramakrishnan inc.'s 2008 and 2009 balance sheets is listed below (in millions of rupees.

Current assets	2008 Rs	2009 Rs	Current liabilities	2008 Rs	2009 Rs
Cash and marketable securities	15	20	Accrued wages and taxes	18	19
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Solution

i) Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

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For 2008 cash Ratio = $\frac{15}{103}$ = 0.145

For 2009 cash Ratio = $\frac{20}{115}$ = 0.173

5. a) Describe the advantages and limitations of marginal costing **(Unit-IV, Page No. 216,218, Topic.4.14 & 4.15)**

OR

b) Whittier Company plans to sell 1,000 movers at Rs. 400 each in the coming year Product costs include:

Direct materials per movers Rs. 180. Direct labour per mower 100

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Required

1. Calculate the total variable cost per unit

2. Calculate the tiotal fixed expense for the year

3. Calculate the number of mowers that Whittier Company must sell to break even

Ans :

1. Variable Cost

Variable cost = Total Quantity of output $\times$ Variable cost per unit of output

Given : Direct materials per mower = Rs. 180

Direct labour per mower = Rs. 100

Variable selling expense of commission per mower = Rs. 20

$$VC = 1000\left(\frac{180}{1000}+\frac{100}{1000}+\frac{20}{1000}+\frac{25}{1000}\right)$$

$= 305$

$\Rightarrow$ Variable cost = ` 305

2. Fixed Cost

Given total fixed factory overhead = Rs. 15,000

Fixed selling and administrative expenses = Rs. 30,000

Fixed cost = 15,000 + 30,000 = Rs. 45,000

3. Break Even Analysis (BEP)

No. of mower that Whittier company must sell to break even

$$\text{BEP (in units)} = \frac{FC(\text{Fixed Cost})}{C(\text{Contribution})}$$

C = Selling Price (S.P) – Variable Cost (VC)

$$\text{BEP (in units)} = \frac{FC}{SP-VC} = \frac{45,000}{400-305} = 473.68$$

---

6. a) Explain the essentials of budgetary control **(Unit-V, Page No.229, Topic-5.2)**

OR

b) The Schlosser Lawn Furniture company uses 12 meters of aluminum pipe at Rs. 0.80 per meter as standard for the production of its Type A lawn chair. During one month's operations. 1,00,000 meters of the pipe were purchased at Rs. 0.78 a meter and 7,200 chairs were produced using 87,300 meters of pipe. The materials recognized when materials are purchased. Calculate Materials Cost, price and quantity variances.

Ans :

i) Material cost variance = Standard Material Cost – Actual material cost

= (87,300 $\times$ 0.80) – (1,00,000 $\times$ 0.78)

= 69,840 – 78,000

= 8,160 unfavourable

ii) Material Price Variance = Actual quantity (standard price – Actual price)

= 1,00,000 (0.78 – 0.80)

= 1,00,000 $\times$ 0.20

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iii) Material usage variance = Standard Price (Standard quantity – Actual quantity)

= 0.80 (87,300 – 1,00,000)

= 10,160 unfavourable

FACULTY OF MANAGEMENT

BBA - III - Year Examination

MANAGEMENT ACCOUNTING

Time : 3 Hours] **ANSWERS TO MARCH / APRIL - 2017** [Max. Marks : 75

Note : Answer all the questions.

PART - A (10 × 2 = 20 Marks) **ANSWERS**

1. Write short notes on the following at one place only.

a) Historical Cost.

Ans :

Historical cost is a measure of a value used in accounting in which the price of an aset on balance sheet is based on its nominal or original cost when acquired by the company. The historical cost method is used for assets in the United States under Generally Accepted Accounting Principles (GAAP). Example, Land and Building.

b) Notional Cost.

Ans :

Notional costs and opportunity costs are two important concepts in cost and management accounting as they have for reaching effects on decisions making process. But both are distinct and under standing the features of each type of cost is vital as it has important implications from decision making perspective.

c) Process costing. **(Unit-III, Page No. 81, Q.6)**

d) Joint and By Product costing

Ans :

Joint Costing

Joint costs are the costs that are incurred from buying or producing two products at the source time in cost accounting terms joint costs have source cost objects. For example , shipping costs. This include product cost and advertisement cost.

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It refers to the costs used to create a product. These costs include direct labour, direct materials, consumable production supplies and factory overhead. Product cost can also be considered the cost of the labour requred to deliver a service to a customer in the letter case, product cost should include all costs related to a service, such as compensation, payroll taxes and benefits for employee etc.

e) Debt Euqity Ratio. **[Unit-III, Page No. 93, Topic-3.2.2 (a)]**

f) Inventory turnover ratio

Ans :

The inventory turnover ratio is calculated by dividing the cost of goods sold for a period by the average inventory for that period. Average inventory is used instead of ending inventory because many companies merchandise fluctuations throughout the year.

g) Break even point. **(Unit-IV, Page No. 192, Topic-4.9)**

h) Margin of Safety. **(Unit-IV, Page No. 203, Topic-4.11)**

i) Fixed Vs Variable budget. **(Unit-V, Page No. 242, Topic-C 1, 2)**

j) Material variance. **(Unit-V, Page No. 261, Topic-5.17.1)**

PART - B (5 × 10 = 50 Marks)

2. a) Explain the concept of cost and its classification **(Unit-I, Page No.16, Topic-1.5)**

OR

b) From the following information prepare cost sheet

	Rs.
Direct material	1,60,000
Direct labour	45,000
Direct expenses	15,000
Factory overheads	35,000
Office and administration overheads 20% of works cost	
Selling and distribution over heads	45,000
Closing stock of finished goods	25,000
Profit on sales 10%	10,000

Ans :

Statement of Cost

	Direct Material	1,60,000
	Direct Labour	45,000
	Direct expenses	15,000
a)	Prime cost	2,20,000
	Add : Factory overhead	35,000
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	Add : Office and admn overhead (20% of work cost)	51,000
c)	Cost of production	3,06,000
	Add : opening stock of finished goods	25,000
		3,31,000
	Less : Closing stock of finished goods	10,000
d)	Cost of goods sold	3,21,000
	Add : Selling and distribution overhead	45,000
e)	Cost of sales	3,66,000
	Profit on sales 10%	36,600
	SALES	4,02,600

3. a) Explain the nature and scope of management accounting

Nature of Management A/c. **(Unit-II, Page No. 48, Topic.2.1.3)**

Scope of Management A/c. **(Unit-II, Page No. 50, Topic.2.1.4)**

OR

b) Describe the methods and systems of costing. **(Unit-II, Page No. 64, Topic.2.7.1)**

4. a) Describe the advantages and limitations of ratio analysis

Advantages. **(Unit-III, Page No. 87, Topic.3.1.5)**

Limitations. **(Unit-III, Page No. 90, Topic.3.1.6)**

OR

b) Excepts from Ramakrishnan inc.'s 2008 and 2009 balance sheets is listed below (in millions of rupees.

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Solution

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5. a) Describe the advantages and limitations of marginal costing **(Unit-IV, Page No. 216,218, Topic.4.14 & 4.15)**

OR

b) Whittier Company plans to sell 1,000 movers at Rs. 400 each in the coming year Product costs include:

Direct materials per movers Rs. 180. Direct labour per mower 100

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Required

1. Calculate the total variable cost per unit

2. Calculate the tiotal fixed expense for the year

3. Calculate the number of mowers that Whittier Company must sell to break even

Ans :

1. Variable Cost

Variable cost = Total Quantity of output $\times$ Variable cost per unit of output

Given : Direct materials per mower = Rs. 180

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Variable selling expense of commission per mower = Rs. 20

$$VC = 1000\left(\frac{180}{1000}+\frac{100}{1000}+\frac{20}{1000}+\frac{25}{1000}\right)$$

$= 305$

$\Rightarrow$ Variable cost = ` 305

2. Fixed Cost

Given total fixed factory overhead = Rs. 15,000

Fixed selling and administrative expenses = Rs. 30,000

Fixed cost = 15,000 + 30,000 = Rs. 45,000

3. Break Even Analysis (BEP)

No. of mower that Whittier company must sell to break even

$$\text{BEP (in units)} = \frac{FC(\text{Fixed Cost})}{C(\text{Contribution})}$$

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---

6. a) Explain the essentials of budgetary control **(Unit-V, Page No.229, Topic-5.2)**

OR

b) The Schlosser Lawn Furniture company uses 12 meters of aluminum pipe at Rs. 0.80 per meter as standard for the production of its Type A lawn chair. During one month's operations. 1,00,000 meters of the pipe were purchased at Rs. 0.78 a meter and 7,200 chairs were produced using 87,300 meters of pipe. The materials recognized when materials are purchased. Calculate Materials Cost, price and quantity variances.

Ans :

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FACULTY OF MANAGEMENT

BBA - III - Year Examination

MANAGEMENT ACCOUNTING

Time : 3 Hours] **ANSWERS TO MARCH / APRIL - 2017** [Max. Marks : 75

Note : Answer all the questions.

PART - A (10 × 2 = 20 Marks) **ANSWERS**

1. Write short notes on the following at one place only.

a) Historical Cost.

Ans :

Historical cost is a measure of a value used in accounting in which the price of an aset on balance sheet is based on its nominal or original cost when acquired by the company. The historical cost method is used for assets in the United States under Generally Accepted Accounting Principles (GAAP). Example, Land and Building.

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f) Inventory turnover ratio

Ans :

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PART - B (5 × 10 = 50 Marks)

2. a) Explain the concept of cost and its classification **(Unit-I, Page No.16, Topic-1.5)**

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b) From the following information prepare cost sheet

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e)	Cost of sales	3,66,000
	Profit on sales 10%	36,600
	SALES	4,02,600

3. a) Explain the nature and scope of management accounting

Nature of Management A/c. **(Unit-II, Page No. 48, Topic.2.1.3)**

Scope of Management A/c. **(Unit-II, Page No. 50, Topic.2.1.4)**

OR

b) Describe the methods and systems of costing. **(Unit-II, Page No. 64, Topic.2.7.1)**

4. a) Describe the advantages and limitations of ratio analysis

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Ans :

1. Variable Cost

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Given : Direct materials per mower = Rs. 180

Direct labour per mower = Rs. 100

Variable selling expense of commission per mower = Rs. 20

$$VC = 1000\left(\frac{180}{1000}+\frac{100}{1000}+\frac{20}{1000}+\frac{25}{1000}\right)$$

$= 305$

$\Rightarrow$ Variable cost = ` 305

2. Fixed Cost

Given total fixed factory overhead = Rs. 15,000

Fixed selling and administrative expenses = Rs. 30,000

Fixed cost = 15,000 + 30,000 = Rs. 45,000

3. Break Even Analysis (BEP)

No. of mower that Whittier company must sell to break even

$$\text{BEP (in units)} = \frac{FC(\text{Fixed Cost})}{C(\text{Contribution})}$$

C = Selling Price (S.P) – Variable Cost (VC)

$$\text{BEP (in units)} = \frac{FC}{SP-VC} = \frac{45,000}{400-305} = 473.68$$

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6. a) Explain the essentials of budgetary control **(Unit-V, Page No.229, Topic-5.2)**

OR

b) The Schlosser Lawn Furniture company uses 12 meters of aluminum pipe at Rs. 0.80 per meter as standard for the production of its Type A lawn chair. During one month's operations. 1,00,000 meters of the pipe were purchased at Rs. 0.78 a meter and 7,200 chairs were produced using 87,300 meters of pipe. The materials recognized when materials are purchased. Calculate Materials Cost, price and quantity variances.

Ans :

i) Material cost variance = Standard Material Cost – Actual material cost

= (87,300 $\times$ 0.80) – (1,00,000 $\times$ 0.78)

= 69,840 – 78,000

= 8,160 unfavourable

ii) Material Price Variance = Actual quantity (standard price – Actual price)

= 1,00,000 (0.78 – 0.80)

= 1,00,000 $\times$ 0.20

= 2,000 unfavourable

iii) Material usage variance = Standard Price (Standard quantity – Actual quantity)

= 0.80 (87,300 – 1,00,000)

= 10,160 unfavourable

FACULTY OF MANAGEMENT

BBA - III - Year Examination

MANAGEMENT ACCOUNTING

Time : 3 Hours] **ANSWERS TO MARCH / APRIL - 2017** [Max. Marks : 75

Note : Answer all the questions.

PART - A (10 × 2 = 20 Marks) **ANSWERS**

1. Write short notes on the following at one place only.

a) Historical Cost.

Ans :

Historical cost is a measure of a value used in accounting in which the price of an aset on balance sheet is based on its nominal or original cost when acquired by the company. The historical cost method is used for assets in the United States under Generally Accepted Accounting Principles (GAAP). Example, Land and Building.

b) Notional Cost.

Ans :

Notional costs and opportunity costs are two important concepts in cost and management accounting as they have for reaching effects on decisions making process. But both are distinct and under standing the features of each type of cost is vital as it has important implications from decision making perspective.

c) Process costing. **(Unit-III, Page No. 81, Q.6)**

d) Joint and By Product costing

Ans :

Joint Costing

Joint costs are the costs that are incurred from buying or producing two products at the source time in cost accounting terms joint costs have source cost objects. For example , shipping costs. This include product cost and advertisement cost.

By Product Costing

It refers to the costs used to create a product. These costs include direct labour, direct materials, consumable production supplies and factory overhead. Product cost can also be considered the cost of the labour requred to deliver a service to a customer in the letter case, product cost should include all costs related to a service, such as compensation, payroll taxes and benefits for employee etc.

e) Debt Euqity Ratio. **[Unit-III, Page No. 93, Topic-3.2.2 (a)]**

f) Inventory turnover ratio

Ans :

The inventory turnover ratio is calculated by dividing the cost of goods sold for a period by the average inventory for that period. Average inventory is used instead of ending inventory because many companies merchandise fluctuations throughout the year.

g) Break even point. **(Unit-IV, Page No. 192, Topic-4.9)**

h) Margin of Safety. **(Unit-IV, Page No. 203, Topic-4.11)**

i) Fixed Vs Variable budget. **(Unit-V, Page No. 242, Topic-C 1, 2)**

j) Material variance. **(Unit-V, Page No. 261, Topic-5.17.1)**

PART - B (5 × 10 = 50 Marks)

2. a) Explain the concept of cost and its classification **(Unit-I, Page No.16, Topic-1.5)**

OR

b) From the following information prepare cost sheet

	Rs.
Direct material	1,60,000
Direct labour	45,000
Direct expenses	15,000
Factory overheads	35,000
Office and administration overheads 20% of works cost	
Selling and distribution over heads	45,000
Closing stock of finished goods	25,000
Profit on sales 10%	10,000

Ans :

Statement of Cost

	Direct Material	1,60,000
	Direct Labour	45,000
	Direct expenses	15,000
a)	Prime cost	2,20,000
	Add : Factory overhead	35,000
b)	Work cost or factory cost	2,55,000
	Add : Office and admn overhead (20% of work cost)	51,000
c)	Cost of production	3,06,000
	Add : opening stock of finished goods	25,000
		3,31,000
	Less : Closing stock of finished goods	10,000
d)	Cost of goods sold	3,21,000
	Add : Selling and distribution overhead	45,000
e)	Cost of sales	3,66,000
	Profit on sales 10%	36,600
	SALES	4,02,600

3. a) Explain the nature and scope of management accounting

Nature of Management A/c. **(Unit-II, Page No. 48, Topic.2.1.3)**

Scope of Management A/c. **(Unit-II, Page No. 50, Topic.2.1.4)**

OR

b) Describe the methods and systems of costing. **(Unit-II, Page No. 64, Topic.2.7.1)**

4. a) Describe the advantages and limitations of ratio analysis

Advantages. **(Unit-III, Page No. 87, Topic.3.1.5)**

Limitations. **(Unit-III, Page No. 90, Topic.3.1.6)**

OR

b) Excepts from Ramakrishnan inc.'s 2008 and 2009 balance sheets is listed below (in millions of rupees.

Current assets	2008 Rs	2009 Rs	Current liabilities	2008 Rs	2009 Rs
Cash and marketable securities	15	20	Accrued wages and taxes	18	19
Accounts receivable	75	84	Accounts payable	45	51
Inventory	110	121	Notes payable	40	45
Total	200	225	Total	103	115

Solution

i) Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

For 2008 Current Ratio = $\frac{200}{103}$ = 1.94

For 2009 Current Ratio = $\frac{225}{115}$ = 1.95

ii) Quick Ratio = $\frac{\text{Quick assets}}{\text{Current liabilities}}$

Quick Assets = Total current Assets – Inventory – prepaid expenses

(Ignore prepaid expenses it is not given)

Quick Ratio for 2008 = $\frac{200-110}{103}$ = 0.87

For 2009 Quick Ratio = $\frac{225-121}{115}$ = 0.90

iii) Cash Ratio = (cash + cash equivalent) / Total current liabilities

For 2008 cash Ratio = $\frac{15}{103}$ = 0.145

For 2009 cash Ratio = $\frac{20}{115}$ = 0.173

5. a) Describe the advantages and limitations of marginal costing **(Unit-IV, Page No. 216,218, Topic.4.14 & 4.15)**

OR

b) Whittier Company plans to sell 1,000 movers at Rs. 400 each in the coming year Product costs include:

Direct materials per movers Rs. 180. Direct labour per mower 100

Variable factory over head per mower 25. total fixed factory overhead 15,000

Variable selling expenses is a commission of Rs. 20 per mover. fixed selling and administrative expense total Rs. 30,000

Required

1. Calculate the total variable cost per unit

2. Calculate the tiotal fixed expense for the year

3. Calculate the number of mowers that Whittier Company must sell to break even

Ans :

1. Variable Cost

Variable cost = Total Quantity of output $\times$ Variable cost per unit of output

Given : Direct materials per mower = Rs. 180

Direct labour per mower = Rs. 100

Variable selling expense of commission per mower = Rs. 20

$$VC = 1000\left(\frac{180}{1000}+\frac{100}{1000}+\frac{20}{1000}+\frac{25}{1000}\right)$$

$= 305$

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