SELF LEARNING MATERIAL

COMMERCE

COURSE : COM - 103

(1st Semester)

COST AND MANAGEMENT ACCOUNTING

BLOCK : 1,2,3, 4 & 5

Directorate of Open & Distance Learning
DIBRUGARH UNIVERSITY
DIBRUGARH-786004

COMMERCE

COURSE : COM - 103

COST AND MANAGEMENT ACCOUNTING

Contributor :

Prof. ARM Rehman
Department of Commerce
Dibrugarh University

Editor :

Dr. Ajanta B. Rajkonwar
Department of Commerce
Dibrugarh University

Published on behalf of the Directorate of Open and Distance Learning, Dibrugarh University by the Director, DODL, D.U. and printed at **SUNPRINT,** Dibrugarh University Market Complex, Dibrugarh-786004.

Acknowledgement

The Directorate of Open and Distance Learning, Dibrugarh University duely acknowledges the financial assistance from the Distance Education Council, IGNOU, New Delhi for preparation of this Self Learning Material.

COMMERCE

COURSE : COM - 103

COST AND MANAGEMENT ACCOUNTING

CONTENTS

COST AND MANAGEMENT ACCOUNTING

BLOCK - 1

COST ACCOUNTANCY : INTRODUCTION
ACTIVITY BASED COSTING - COST REDUCTION

This block comprises three units.

UNIT- 1 : EVOLUTION OF COST ACCOUNTANCY, CONCEPTS AND CONVENTIONS OF COST ACCOUNTANCY, ESSENTIALS OF COST ACCOUNTING SYSTEM

Structure

1.0 Objectives

After going through this unit, you should be able to :

- Explain the definition of Cost Accounting.
- Discuss the nature and objectives of Cost Accounting.
- Narrate the importance of Cost Accounting.
- Trace the evolution of Cost Accounting.
- Define clearly the important cost concepts.

1.1 INTRODUCTION

In fact, costs play a significant role in the context of "matching concept". Truly speaking cost determination and its application is not only useful to accountants but it is also used as a technique of managerial decision-making, business strategy and industrial control. Therefore, it is appropriate to introduce you with the basic foundation and idea about the mechanism of cost accounting principles so as to enable you to understand its applicability to Management Accounting.

1.2 DEFINITIONS OF COST, COSTING AND COST ACCOUNTING

Cost

Cost may be defined as one which is sacrificed or is given in order to obtain something. The cost of an item represents actual outgoings or ascertained charges incurred in its production and sale. This term means the cost to produce and sell, but because of different meaning, it is advisable to qualify the term 'cost' to express exactly what it means e.g. prime cost, works cost, total cost etc.

Costing

Costing is a term which denotes the 'technique' or 'process' of ascertaining cost.

" It is the technique and process of ascertaining costs". - I.C.M.A., London

It expresses the actual cost of any particular unit of production and also discloses how such total cost is constituted. According to Wheldon, it is "the classifying, recording and appropriate allocation of expenditure for the determination of the costs of products or services; the relation of these costs to sales volumes and the ascertainment of profitability."

Cost Accounting

Cost Accounting is the art and science of computing and determining the cost of production. The Institute of Costs and Works Accountants of London defined cost accountancy as "the application of costing and cost accounting principles, methods and techniques to the science, art and practice of cost control and the ascertainment of profitability. It includes the presentation of information derived therefrom for the purpose of managerial decision making."

According to **Kohler**-cost accounting includes the presentation and interpretation of cost data as an important decision-making tool to management, in controlling current and future operations. He has defined cost accounting as :

"…….. that branch of accounting dealing with the classification, recording, allocation, summarization and reporting of current and prospective costs. Included in the field of cost accreting are the design of operation of cost systems and procedures; the determination of costs byu departments, functions, responsibilities, activities, products, territories, periods and other units of forecasted future costs and standard or desired costs, as well as historical costs; the comparison of costs of different periods, of actual with estimated or standard costs, and of alternative costs; the presentation and interpretation of cost data s an aid to management in controlling current and future operations."

Other important definitions of cost accounting are also presented here.

According to **Sickele** - Cost accounting is the science of recording and presenting business transactions pertaining to the production of goods and services, whereby these records become a method of measurement and a means of control.

Morse has defined it as - Cost accounting is the processing and evaluation of monetary and non-monetary data to provide information for external reporting, internal planning and control of business operations and special analysis and decisions.

All these definitions thus reveal three different interpretations of cost accounting :

(i) Cost record keeping aspect,

(ii) Cost finding aspect and

(iii) Decision Making aspect.

1.3 NATURE OF COST ACCOUNTANCY

The nature of Cost Accounting may be explained as :

1. Ascertainment of cost : Cost Accounting is concerned with ascertainment of cost of each product, process or operation and ensuring that all the expenses have been absorbed in the cost of products. For this purpose, the Cost Accountant has to introduce a system of recording costs. Suitable records should be maintained for materials, labour and overheads. The cost data gives a basis for the determination of selling price. Again matching of costs with revenue helps in assessing the profitability of each product or service.

2. Cost control : Cost accounting is also concerned with improving efficiency by controlling and reducing cost. This aspect is becoming increasingly important due to growing competition. This is achieved by using budgets and standards set up for the guidance of management. Deviations are ascertained by comparing actual with standards.

Accordingly remedial measures are taken. A check is also exercised over the stocks of raw materials, work-in-process, and finished gods so that wastage is avoided and least amount of capital is locked up in these stocks.

3. Determination of prices : Cost Accounting provides detailed information about the cost of product. It provides adequate cost data for fixation of selling prices and submitting quotations. It also guides management is fixing prices during the time of depression or incurrence of loss.

4. Managerial decision : Cost Accounting provides suitable data and information to management on different decisional

problems, such as : 9i) whether to make or buy ; (ii) whether to accept an order below cost; (iii) whether to introduce a new product; (iv) what should be the priority accorded to a product and (v) future expansion policies and capital outlays.

1.4 OBJECTIVES OF COST ACCOUTING

The objects of cost accounting can be grouped under these two heads:

A. Primary objectives and

B. Secondary objectives.

A. Primary Objectives

i) To ascertain the cost of producing an article or job.

ii) To ascertain the performance of an activity or operation as well as services rendered.

iii) To exercise control and regulate selling price and to see that cost of production of an article or articles are recovered in selling price.

iv) To prepare tender estimate and quotation and minimize the risks of losses while preparing or estimating prices for quotations.

v) To point out and to obviate waste and leakages or loopholes in elements of cost.

vi) To raise 'productivity' of an organization.

B. Secondary Objectives

i) To generate reliable cost information with a view to help the management to have a comparison between workers' efficiency and machine and also tracing leakage in material and labour, maintain control over inventory etc.

ii) To aid management in taking managerial decision on projects plan.

iii) To aid in exercising social control of business.

1.5 IMPORTANCE OF COST ACCOUNTING

Cost accounting is of immense importance to management, employees, creditors, Government and society in general. These are explained under the following heads:

Benefits to Management

Cost accounting aids management is carrying out its functions effectively and efficiently.

Planning : Cost accounting compiles up-to-date cost data, analysed by operations, products, elements, functions and departments and presents them in a suitable form. On the basis of such data, management can plan is future operations in a more efficient manner.

Budgeting : Cost accounting does not merely record actual costs incurred but also works out estimated and standard costs for exercising control. It prepares budgets for future activities based on past experience and anticipated changes in future. It helps management to make an objective assessment of organizational strengths, weaknesses, opportunities and threats (SWOT analysis) before implementing a project.

Decision making : Cost accounting enables management to arrive at decisions based on cost data. With the help of valuable cost data, management decides issues such as make or buy, expand or contract business activities, putting scarce inputs to effective use, evaluating the profitability of various alternatives, selling below cost price etc.

Pricing : Cost accounting provides useful data for quoting appropriate prices for inland as well as foreign markets by applying the techniques such as marginal costing, budgetary control well before undertaking production schedule. Cost accounting data enables management to fix minimum prices during depression, by segregating expenses into fixed and variable components.

Controlling : Cost accounting serves as a means of control in the following manner:

- An efficient system of inventory control in the form of buying, receiving, inspection, storage, issue of materials, prevents wastage, under-and-over stocking of materials at various levels. The fixation of stock levels and inventory control ensures regular and adequate supply of materials of proper quality and quantity whenever required.
- An appropriate system of control over labour cost by job and time records helps management avoid idle time, defective work etc. and utilize human resources in most optimal way.
- It provides systematic and meaningful records to management, facilitating the introduction of corrective measures at the appropriate time.

Effective utilization of resources : The standards for measuring efficiencfy are set annually. Deviations are checked quickly, weak points are identified and remedial steps are taken up at the right time. The reasons for profit or loss during a period are examined thoroughly for future guidance. Attempts are made to put resources to the best possible use. Costs and revenues of two products, two periods, two departments etc. are compared from time to time with a view to improve efficiency on a continuous basis.

Benefits to Employees

Cost accounting provides a number of benefits to employees which are explained below:

- It facilitates the introduction of different incentive schemes and bonus plans and, thus, provides adequate rewards for sincere and efficient workers.
- Appraisal of employee performance is done scientifically by setting standards of efficiency and measuring it through time and motion studies. Job and time cards help management in identifying people who are regular, productive, and, thus, deserve promotions from time to time.

Benefits to Creditors

Creditors, bankers, debentureholders study the data provided by cost accountants in order to ascertain the solvency, profitability and future prosperity of an enterprise before they lend. The reports of cost accountants immensely help them take right decisions.

Benefits to the Government

The techniques of cost accounting are useful in formulating national plans aimed at achieving economic progress. In order to take decisions relating to price ceiling, import and export policies, granting of quotas and subsidies, taxation, the Government requires cost data of various industries, Cost audit, to a large extent, helps in ensuring that corporate funds are not squandered away in uneconomical activities.

Benefits to the Society :

Costing provides immense benefits to the society in the following ways :

- It minimizes all kinds of waste, facilities are used to their maximum potential, and therefore, ultimate consumers get quality products at an economical price.
- It brings stability by improving operating and managerial efficiency.
- Cost reduction and cost saving efforts carried out by various firms helps in curbing inflationary tendencies in the economy of the country.

1.6 EVOLUTION OF COST ACCOUNTING

Though financial accounting had its beginning early during the modern civilization, development of cost accounting has been rather slow and late The beginning of cost accounting may be first traced to Robert Loder's "Farm Accounts" for 1610-20. Attempts were made by many industrialists in Great Britain and in the United States to install factory cost systems as early as in 1805. However, such efforts were sporadic.

According to Lawrence and Humphreys, some good starting point was 1875 with the writings of John Walker, a practical foundryman, when he published in Liverpool, "Prime Cost Keeping for Engineers, Iron founders, Boiler and Bridge Makers et cetera." Although his book was entitled Prime Cost Keeping, chapter V described 'the manner in which the percentage for general expenses is arrived at.' He stated the basic data of costing and indicated how they should be recorded. He described how average costs of material and labour over fixed periods of time should be computed, the period of such average being quarter of a year.

Serious studies in cost accounting started in 1890's with the writings of Henry Metcalfe "The Cost of Manufactures", Emile Garcke and John Manger Fells "Factory Accounts : Their Principles and Practice", George P. Norton "Textile Manufacturers" Book-Keeping", J. Slater Lewis "The Commercial Organisation of Factories" and later with Alexander H. Church "The Proper Distrubiton of Establishment Charges", Engineering Magazine, 1901; J. Lee Nicholson "Cost Accounting : Theory and Practices" and J. Maurice Clark "Studies in the Economics of Overhead Costs." The development of cost accounting in this period was also slow due to the following two reasons.

- Firstly, cost accounting tried to adopt itself within the framework of financial accounting.
- Secondly, the accountants had a tendency not to disclose the cost accounting methods they had developed within their own firms.

The First World War brought in "cost plus contract" in the field of cost accounting. With a view to avoid delays in estimating for urgent contracts, contracts were placed for war work on the basis that they would reimburse the cost, plus a percentage to cover the administration and other overhead expenses incurred by the contractee. The demand for persons adequately qualified to price such contracts caused a great influx to the profession of cost accounting. In 1919 the Institute of Cost and Works Accountants (presently known as the

Chartered Institute of Management Accountants) came into being in Great Britain. At about the same time, the National Association of Cost Accountants (now known as the National Association of Accountants) was established in New York. These two institutions have contributed significantly to the progress of cost accounting profession.

The advancement of cost accounting during this period was influenced by the growth of 'scientific management' and a shift of emphasis from cost ascertainment to cost control. In 1920's the 'standard costs' were developed in the USA and the leading cost accountants in Great Britain recognized it as a remarkable and progressive addition to their costing techniques. Budgetary control also followed subsequently. Cost accounting was integrated within the general accounts and standard costs were initiated to measure performance. Thus, the gradual evolution of cost accounting upto mid 1950's can be traced to the following stages:

Stage - I : Cost accounting was developed for cost ascertainment (including inventory valuation) and profit measurement.

Stage - II : The emphasis was on cost control.

Stage - III : Cost analysis stage.

In India the necessity of qualified cost accountants was felt particularly during the Second World War. The number of these accountants at that time was not many. They acquired their professional education and training from the Institute of Cost and Management Accountants of England. They were mainly employed in Indian Defence Factories where historical costing and budgetary control had been in vogue for a number of years.

It was felt that the profession of Cost Accounting be formally organized in India. In 1959, the Cost and Works Accountants Act of India was enacted by the Government of India and the Institute of Cost and Works Accountants of India which initially was a company limited by guarantee, started functioning as a body corporate.

Thereafter the Government of India have been taking important steps to improve the profession. The concept of cost audit is an example on the point. The financial audit (Sec. 224-227 of the Companies Act, 1956) at the end of the year was

perhaps considered by the Government to be inadequate to assess the real efficiency of working of manufacturing establishments. Accordingly the Government of India have framed Cost Accounting Record Rules for maintenance of cost statements for various industries (upto 31st March, 1986, 34 industries have been brought under the purview of the Cost Accounting Record Rules). As a secondary step, the Government of India from time to time issues order under Section 233-B for cost audit in the selected industries falling under the purview of the record rules. The Sachar Committee have recommended for 'continuous audit' in certain industries. The Institute of Cost and Works Accountants of India has also been making efforts for development of the profession. A separate Directorate has been functioning exclusively for promoting professional development.

1.7 ESSENTIALS OF COST ACCOUNTING

An ideal and well-structured system of cost accounting is essential for ascertaining and controlling costs. To meet the management requirements of cost identification and control in organization, a sound cost recording system must be established. The following are some of the essentials of a good costing system:

1. Suitable : The cost accounting system must be suitable. It must be developed according to the nature, conditions, size and requirements of the organisation.

2. Simple : It must be simple and easy to understand and implement. Simple record and clear form of control is the foremost requirement.

3. Flexible : The costing system must be flexible enough so that it can be adapted to the changes that may take place in the organization.

4. Comparable : The costing system should be implemented in such a way that the management must be able to make a comparison of facts with the past figures, figures of other concerns or other departments of the same unit.

5. Uniform : All forms and proforma etc. used in the costing system should be uniform in size and quality of contents.

6. Cost-effective : The system should be cost effective to ensure that the benefits must outweigh the costs.

7. Labour-saving : The cost accounting system must involve minimum clerical work so that employees of the organization should feel it easy while implementing the system.

8. Control : It must provide for an effective system of control over materials, labour and overhead costs.

9. Reconciliation: The cost accounting system must be so devised that financial as well as cost records are capable of easy reconciliation.

1.8 COST CONCEPTS FOR MANAGERIAL DECISIONS

For managerial decision purposes, costs may be classified into the following types:

Differential costs : Differential cost is the increase or decrease in total cost that results from an alternative course of action. It is determined by subtracting the cost of one alternative from the cost of another alternative. The alternative choice may arise because of change in the method of production, change in the volume of sales, make or buy decisions, accept or refuse decisions etc.

Opportunity costs : It is the measurable advantage scarified as a result of the rejection of alternative uses of resources, whether of materials, labour or facilities. For example, if an owned building is proposed to be used for a project, the likely rent of the building is the opportunity cost which should be taken into consideration for evaluating the profitability of the project.

Imputed costs : These are the costs that do not involve at any time actual cash outlay and, as a consequence, which do not appear in the financial records. However such costs involve foregoing on the part of the person or persons for whom costs are being calculated. In fact, these are hypothetical costs which are computed only for the purpose of decision making. For instance, rent on own building, interest on capital etc. are imputed costs.

Replacement cost : This is the cost at which an identical asset could be purchased so that the identical old asset is being

replaced. In other words replacement cost is the current market cost of replacing an asset. When the management contemplates the replacement of an asset, it has to keep in mind its replacement cost and not the cost at which it was purchased earlier.

Out-of-pocket costs : Out-of-pocket costs represent cash payments to be incurred (such as wages, rent) as against costs which do not require cash outlay(viz depreciation). It is widely used by business concerns as an aid in making decision pertaining to price fixation during depression, make or buy decisions etc.

Sunk costs : These costs were incurred in the past and are not recoverable in a given condition. Sunk costs may not be relevant for a particular decision-making. For example, a machine costing Rs.25,000 has a present book value of Rs,5,000. If the machine were scrapped and replaced, the loss would be Rs.5,000.This undepreciated book value of the machine is a sunk cost and is not relevant to decision regarding the replacement of this machine.

Conversion cost : This cost denotes the sum of direct labour and overhead costs in the manufacture of a product. It represents the total cost of 'converting' a raw material into finished product. Appropriate use of this cost can be made in certain managerial decision.

Future costs : Since no decision can change historical costs, decisions made now can affect only what will happen in the future. Hence the only relevant costs for decision-making are pre-determined or future costs. At the same time, it is the historical costs which generally provide a basis for computation of future cost. Besides this, anticipated changing relationships in the future are also important for estimating future costs.

1.9 POINTS TO REMEMBER

Cost Accounting is concerned with recording, classification, ascertainment, allocation, summarization and reporting of current and prospective costs.

The primary objectives of cost accounting are :

(i) To ascertain the cost of product.

(ii) To ascertain the performance of an activity or operation.

(iii) To exercise control and regulate selling prices.

(iv) To raise the productivity of an organistion.

Cost Accounting is of immense importance to management, employees, creditors, Government and society in general. It aids management in carrying out the managerial functions effectively and efficiently in the areas of planning, budgeting, decision-making, controlling and optimal utilization of resources.

The following are some of the essential of a good costing system:

(i) Suitable, (ii) Simple, (iii) Flexible, (iv) Comparable, (v) Uniform (vi) Cost-effective, (viii) Labour-saving, (viii) Control and (ix) Reconciliation.

1.10 KEY WORDS

Cost : The cost of an item means actual outgoings or ascertained charges incurred in its manufacture and sale.

Costing : It is a term which indicates the technique and process of ascertaining costs.

Differential cost : Differential cost represents the increase or decrease in the total cost that results from an alternative course of action.

Opportunity cost : It is the measurable advantage sacrificed as a result of rejection of alternative uses of resources, whether of materials, labour or facilities.

Imputed costs : These are the costs that do not involve at any time actual cash outlay and as a consequence, do not appear in the financial records.

Out-of-pocket costs : Out-of-pocket costs represent cash payments to be incurred (such as wages, rent) as against costs which do not require cash outlay (viz. depreciation).

Sunk costs: These costs were incurred in the past and are not recoverable in a given condition.

Conversion cost : It represents the total cost of converting a raw material into finished product.

1.11. SELF-ASSESSMENT QUESTIONS OR ASSIGNMENTS

1. What is cost accounting? Discuss the objectives of cost accounting.
2. Explain the importance of cost accounting as a managerial tool.
3. How does cost accounting help in the planning and control of operations of a business enterprise?
4. " A sound costing system must place the same emphasis on cost control as on cost ascertainment." Comment on the statement.
5. Describe the definitions of cost, costing and cost accounting. Discuss the nature of cost accounting.
6. Give a brief account of the evolution of cost accounting.
7. "While financial accounting is external, cost accounting is internal to the business". Comment.
8. Discuss the essentials of cost accounting.
9. Explain the different cost concepts for managerial decisions.
10. Narrate the following cost concepts :
    (a) Differential cost.
    (b) Opportunity cost
    (c) Imputed cost
    (d) Sunk cost
    (e) Out-of-pocket cost
    (f) Future cost

1.12 FURTHER READINGS

Arora, M.N., "Cost Accounting" Vikas Publishing House Pvt. Ltd., New Delhi.

Jain, S.P. and Narang, K.L., "Cost Accounting" Kalyani Publishers, New Delhi.

Khan, M.Y. and Jain, P.K., "Cost Accounting" Tata McGraw-Hill Publishing Company Ltd., New Delhi.

Block - 1

UNIT - 2 : ACTIVITY BASED COSTING

Structure

2.0 Objectives

After studying this unit, you should be able to :

- Explain the meaning of Activity Based Costing.
- State the classification of activities.
- Define Cost Drivers.
- Make a comparison of Activity Based Costing with Conventional Costing System.
- Discuss the impact of Activity Based Costing in terms of its benefits and limitations.

2.1 WEAKNESSES OF CONVENTIONAL COSTING

Conventional costing suffers from some inherent weaknesses. Conventional costing may lead to overcosting or undercosting of products or services. Overcosting happens when a product or service consumes a relatively low level of

resources but is allocated a relatively high cost. Undercosting occurs when a product or service consumes a relatively high level of resources but is allocated a relatively low cost. Over- or undercosting of products leads to distorted cost information. Substandard cost information causes management to make wrong decisions for product emphasis, pricing, make or buy etc. Subsequently the objectives of costing system remain far from having been achieved.

Traditional costing leads to under or overcosting of products or services mainly due to following reasons. In traditional costing, overhead or indirect costs are recovered on the basis of volume only e.g., labour hour rate, machine hour rate etc.

Under the traditional method of allocation, costs are averaged or spread over products / services equally irrespective of activities or demands on resources. This is because of the fundamental assumption in the allocation of cost that the higher the volume the greater the share of indirect costs to a product or service and vice versa. In fact, this assumption is not based on reality.

2.2 MEANING OF ACTIVITY-BASED COSTING

An activity is a process or procedure that causes work. Activity-Based Costing gives emphasis on activities as the fundamental cost objects. In the context of ABC by acivities we only mean the activities of the support or service departments viz. machine set-up, material handling, engineering charge, quality testing, inspection etc. It is thus apparent that ABC differs from the traditional costing system only in respect of allocation of overhead or indirect costs. Direct costs are identified with the cost object, in the same way as done in case of traditional costing system. Overhead costs are attached to the cost objects based on activities.

Activities drive costs. Therefore, costs are allocated based on appropriate cost drivers. Consequently cost drivers are the factors that are significant determinants of costs. For

instance, costs of warehousing depend on the number of items in stock, costs of purchase department depend on the number of orders placed etc. A few examples of activities and the relevant cost drivers are given below :

Activity	Cost driver
Purchasing materials	... No. of orders placed
Warehousing	... Items in stock
Material handling	.... No. of parts
Inspection	.... Inspection per item
Quality testing	.... Hours of test time
Packing	.... No. of packing orders
Distribution	.... No. of depots
Customer Service	.... No. of orders
Receiving materials	.... No. of receiving orders
Communications	.... No. of phone calls

Activity-Based Costing is not an alternative costing system. It is an approach to develop more logically and accurately the cost numbers used in the existing costing systems. It then facilitates various strategic exercises such as value chain analysis, benchmarking, target costing etc. for overall operational improvement.

2.3. STAGES AND FLOW OF COSTS IN ACTIVITY-BASED COSTING

There are two primary stages in Activity-Based costing. Firstly, tracing costs to activities and secondly, tracing activities to products.

First, activities are identified and thereafter classified into different categories that have relationship with the different parts of the production process. Direct labour related activities, machine related activities (machine cost centers), and support activities such as ordering, receiving, materials handling, production scheduling, packing and despatching are examples of such activities.

Secondly, factory overhead costs of the activities are identified and classified into homogeneous cost pools. A homogendes cost pool is a collection of overhead costs that are logically related to the tasks being performed. A cost pool should be established for each activity. Cost pool is like a cost centre or activity centre around which costs are accumulated.

Third, the factors that affect the cost of a particular activity should be identified. They ate called cost drivers. Direct costs do not need cost drivers as they can be linked directly to a product. Direct costs are themselves cost drivers. But all other works or manufacturing costs need cost drivers. Cost drivers are the forces, factors that determine the cost of activities. Cost drivers can link a pool of costs in an activity centre to the product. The basic assumption in Activity-Based Costing is that cost behaviour is influenced by cost drivers. Thus, in order to trace overhead costs to products, appropriate cost drivers should be identified.

2.4. COST ANALYSIS UNDER ACTIVITY BASED COSTING

Activities are identified and classified into different categories or segments of the production process. The grouping of activities is done using the different levels at which activities are performed. Activities are broadly classified into one of the four activity categories :

1. Unit level Activities
2. Batch level Activities
3. Product level Activities
4. Facility level Activities

Unit level activities are those activities that are performed each time a unit is produced. These are repetitive activities. For instance, direct labour hours, machine hours, power are used each time a unit is produced. Direct meterials and direct labour activities are also unit level activities, although these are not overhead costs. Costs of unit level activities vary with the number of unit produced.

Batch level activities are those activities which are performed each time a batch of goods is produced. The cost of batch level activities varies with the number of batches but are fixed with regard to the number of units in each batch. Material handling, machine setups, inspections, production scheduling are examples of batch level activities which are related to batches rather than to individual products.

Product level activities are performed to support the production of each different type of product. Maintenance of equipment, maintaining bills of materials, handling materials, testing routines are some examples of product-level activities.

Facility-level activities are those which are necessary for sustaining a factory's general manufacturing process. These activities are common to a variety of products and are very difficult to link to product-specific activities. Factory management, maintenance, plant depreciation, security are examples of facility-level activities.

In Activity-Based Costing, facility-level activities and costs are treated as periodic cost. The costs associated with unit level, batch level and product level - are assigned to products, using cost drivers that express the cause and effect relationship between activity consumption and cost.

2.5. DIFFERENCES BETWEEN ACTIVITY-BASED COSTING AND CONVENTIONAL COSTING

1. The real change Activity-Based Costing implements in the cost structure of the organisation lies in the treatment of allocation of overheads while the conventional system allocates costs between products on the basis of machine-hours or labour-hours.

2. Traditionally companies distribute their overhead, between different products in the same ratio as the respective costs of direct labour in these products. Hence if a unit of the product A consumes twice as many labour-hours as a unit of product B, the total overhead cost per unit is also distributed between product A and product B in the same ratio. As such, the manufacturer of the two

products uses the overheads, in a production that bears no relationship with labour costs.

But the Activity-Based Costing allocates the total overhead costs to different activities on the basis of cost drivers so as to distribute the total costs accurately between them.

3. The result of using Actively-Based costing is found to be a dramatic one. The respective costs of different products are often found to be as much as 50% higher or lower than those computed under the conventional costing system.

2.6. SCOPE OF ACTIVITY-BASED COSTING

The Activity-Based Costing may be effectively used in the following situations where :

1. The ratio of indirect cost to total cost is rising rapidly.
2. The company is confused about the optimum product-mix and pricing.
3. The company seems to be competitive in one line, but not in others.
4. The Turnover is rising without any corresponding growth in profits.
5. Labour operation are being replaced by automated ones. Different operations require varying number of operators.
6. Quality management costs are rising, but not customer-satisfaction.

2.7. BENEFITS AND LIMITATIONS OF ACTIVITY-BASED COSTING

The benefits of Activity-Based Costing are :

1. In Activity-Based Costing, managers emphasize on activities rather than products because activities in various departments may be combined and costs of

similar activities ascertained, e.g. handling of materials, repairs of machines, quality control etc. Since detailed costs are kept by activities, the total company costs for each activity can be ascertained, analysed, planned and controlled.

2. Since costs are identified with activities and then allocated to products or services, based on appropriate cost drivers, product/service costs ascertained are more accurate. Moreover, since overhead or indirect costs constitute a sizable portion of the total costs of the firm, the overall impact of allocation of indirect costs to product/services more accurately is significant.

3. Managers manage activities rather than products. Changes in activities result into changes in costs. Therefore if activities are undertaken efficiently, costs will decrease and products will be more competitive.

4. To manage activities in a better way and to make rational economic decisions, managers need to identify the relationships of causes (activities) and effects (costs) in a more detailed and accurate manner. Activity-Based Costing gives emphasis on this aspect.

5. If management realizes that a large number of its products may be breakeven or unprofitable, the Activity-Based Costing system is useful in setting priorities for managerial decision and action.

The limitations of Activity-Based Costing are :

1. Activity-Based Costing does not encourage managers to think about changing work processes to make business more competitive.

2. In some areas, Activity-Based Costing does not conform to generally accepted accounting principles. For example, Activity-Based Costing encourages allocation of non-product costs like research and development to products while committed product costs like factory depreciation are not allocated to products.

3. Activity-Based Costing does not encourage identification and removal of constraints causing delays. An overemphasis

on cost reduction without regard to constraints, does not create an environment conducive for understanding the problems and their solution.

2.8. INSTALLATION OF ACTIVITY-BASED COSTING

In India, at present, firms have to operate in a competitive environment and there is no scope for inefficiency and cost relating to the same. Although full-fledged implementation of Activity-Based Costing in India is limited, yet many large Indian companies which are using conventional costing leading to allocation of overhead costs need to switch over to the Activity-Based Costing system.

The factors which justify the implementation of Activity-Based Costing are :

(a) Relatively high ratio of overhead costs to total cost;

(b) Product complexity ; and

(c) Diversity of volume.

The steps involved in installation of Activity-Based Costing are :

(a) Primary steps : These are feasibility studies, establishing IT infrastructure, convincing the line-employees and value chain analysis.

(b) Operational steps : These include identification of activities, costs and cost drivers, computation of absorption rates and allocation of overhead costs based on the activities/ transactions.

The aforesaid steps are now explained in brief as follows.

1. Feasibility Study : Installation of Activity-Based Costing needs considerable efforts and costs. The types of costs needed are :

(a) Cost of development of the system and (development cost).

(b) Cost of running the system. (operational cost)

The expected benefits are :

(i) more accurate cost information for product pricing;

(ii) more accurate profit analysis by product, process, customer and department ;

(iii) improved measures of performance ; and

(iv) improved insight into cost causation.

The anticipated benefits should overweigh the costs in order to justify the installation of Activity-Based Costing.

2. IT infrastructure : In practice, a lot of information is required to be generated for Activity-Based Costing. The rationale for Activity-Based Costing depends on the analysis of each and every activity/resource deployed and incurrence of cost. Therefore, creation of a database is a must for successful operation of Activity-Based Costing. Hence, IT infrastructure should be built up to provide necessary back up.

3. Selling the concept to the line-employees : The difficulty in selling the concept to the line-employees was one of the problems faced by many Canadian firms in implementing Activity-Based Costing. Often employees offer resistance to new system. Training programmes, case study, demonstration, group discussion etc. help considerably to sell the concept to the employees.

4. Strategy and value chain analysis : The Activity-Based Costing system must fulfill two basic strategic requirements :

(i) Providing information and analytical support, and

(ii) Providing impetus for development of new and revised strategy.

Value chain analysis emphasizes on the strategic aspects of various activities within the firm. The purpose of value chain analysis is to determine where managers can lower costs from production to distribution in the company's segment of the chain. It, thus encourages operational efficiency and rationalization of cost structure with activities.

5. Inventorisation and screening of activities : The salient feature of Activity-Based Costing is its emphasis on activities as the fundamental cost objects. The whole process of a firm's operations from product design to marketing - are represented by several important activities. Hence, the success of Activities-Based Costing depends on a comprehensive inventorisation of all activities and their screening.

6. Identification of costs and cost drivers : Resources employed, or costs incurred, for undertaking the activities should be identified, Identification of costs vis-à-vis activities may not be easy.

For identification of costs and cost drivers, the following three approaches may be adopted :

(i) Personal observation and measurement by each line-manager in respect of activity under his control ;

(ii) Analysis of cost and operating records ; and

(iii) Feedback about the experience of other organizations.

A cost driver is the cost allocation base. When there are a number of cost drivers for any particular cost pool, costs should be allocated based on the primary cost driver.

2.9. POINTS TO REMEMBER

Traditional costing leads to under or overcastting of products or services since indirect costs are recovered on the basis volume only e.g., labour-hour rate, machine hour rate etc.

Activity-Based Costing is an approach to develop more logically and accurately the cost numbers used in the existing costing systems.

Activity-Based Costing allocates the total overhead costs to different activities on the basis of cost drivers so as to distribute the total costs accurately between them.

2.10. KEY WORDS

Cost Driver	:	Cost drivers are the factors or transactions that are significant determinants of costs. Costs are, therefore, allocated based on appropriate cost drivers.
Cost Pool	:	A cost pool represents a grouping of individual cost items. For indirect or support department costs which need allocation to products or services, such pools need to be

formed. It comprises costs that have the same or similar cause and effect relationship with the cost allocation base.

2.11. SELF ASSESSMENT QUESTIONS

1. Explain briefly the limitations of traditional costing where overhead costs are allocated based on volume.
2. What do you mean by Activity-Based Costing ? How product costs are determined in Activity-Based Costing?
3. How Should costs be allocated in Activity-Based Costing? Illustrate your answer with imaginary figures.
4. Discuss the stages and flow of costs in Activity-Based Costing .
5. Explain, in brief, cost analysis under Activity-Based Costing.
6. Narrate the scope of Activity-Based Costing. Describe the differences between Activity-Based Costing and Conventional Costing.
7. Describe the benefits and limitations of Activity-Based Costing.
8. What are the factors than determine the suitability of application of Activity-Based Costing ? Explain them in brief.
9. Why do managers prefer Activity-Based Costing system to traditional costing system ? Explain the broad classifications of activities in Activity-Based Costing.
10. Write short notes on :
    a. Cost Driver ;
    b. Cost pool ; and
    c. Traditional costing system.

2.12. FURTHER READINGS

Banerjee, B.	"Cost Accounting", The World Press Private Ltd., Kolkata.
Lal, Jawahar,	" Managerial Accounting Himalaya Publshing House, Mumbai.

BLOCK - 1

UNIT - 3 : COST REDUCTION

Structure

3.0 Objectives

After studying this unit, you should be able to :

- Explain the meaning of Cost Reduction.
- State the objectives and scope of Cost Reduction.
- Identity the areas of Cost Reduction.
- Describe the differences between Cost Reduction and Cost Control.
- Discuss the principles of Cot Reduction and control.
- Narrate the techniques to control and reduce Costs.

3.1. MEANING OF COST REDUCTION

Cost control attempts to bring the actuals in harmony with the predetermined targets. If this materialises assuming no increase or decrease in costs, the profit margin becomes

more or less stable at a particular level of sales. Of course, this is easier said than done. In reality, prices may fluctuate. Alternatively, sales may decrease due to different reasons. But in all these situations, the business must aim at maximizing profits at the same level of sales by reducing costs.

Cost reduction aims to achieve a permanent reduction in cost, without jeopardizing the quality of the product. It is a systematically planned way of improving efficiency of business operations.

According to the C.I.M.A., London "Cost reduction is to be understood as the achievement of real and permanent reductions in the unit cost of goods manufactured or services rendered without impairing their suitability for the use intended."

It has three important characteristics :

1. The reduction must be real. It must arise within the organisation as a result of improved efficiency.
2. The reduction must be a permanent one.
3. The reduction should not be at the cost of essential characteristics and quality of the products or services rendered.

3.2. COST CONTROL AND COST REDUCTION :

Cost control and Cost Reduction may both be considered to be the two sides of the same coin,

Cost control aims at reducing inefficiencies and wastes and setting up targets and in achieving them. According to Eric L. Kohler, cost control is the employment of management devices in the performance of any necessary operation so that pre-determined objectives of quality, quantity and time may be achieved at the lowest possible outlay for goods and services. In brief, it is the regulation by executive advice of the costs of operating an undertaking. The first requirement of cost control is to fix the reasonable targets for all important activities, in consultation with employees who are responsible for achieving them. Secondly, the actual performance should be compared with the targets at periodic intervals. Important

deriations must be identified, analysed and brought to the notice of those responsible for results. Cost reduction aims to achieve a permanent reduction in costs, without impairing the quality of the product.

3.3 OBJECTIVES OF COST REDUCTION :

The objectives of cost reduction programmes are :

1. Developing cost consciousness among employees.
2. Avoiding wasteful expenditure.
3. Developing efficient operating procedures.
4. Improving the overall efficiency of organisatised work.

For the purpose of achieving these objectives the cost reduction programmes must be undertaken systematically. Employees of the organisation should be motivated to participate in the programmes actively. Priorities should be pre-determined so as to decide the sequence in which cost reduction efforts must be implemented in different areas.

3.4 PRINCIPLES OF COST REDUCTION AND CONTROL :

Cost reduction and control is a total task and an all-performing job that must affect every phase of the business from inquiry to invoice. Therefore the successful programme is applied with equal weightage to every unit, section, department and division. Further, it is developed keeping with certain basic principles. The violation of any one of these principles reduces the probability of any permanent impact.

The "principles'' of cost reduction and control are almost comparable to the principles of sound management.

1. It must be based on a sound management organisation.
2. The programme must be based on a management cycle.
3. It must be planned job, coupled with all other company activities.

4. The programme is a continuous line responsibility. Therefore, every employee must be held consistently accountable.
5. Responsibility for cost control must be delegated accompanied by corresponding authority.
6. The programme must be assessed, redesigned and revaluated in a continuous process of follow-up.

3.5 SCOPE AND AREAS OF COST REDUCTION

The scope of cost reduction is very vast. Every segment of an organisation is involved in this programme. Cost reduction may be implemented in the following areas :

1. Design : Product design has the maximum scope for offering cost reduction with hamparing quality of the products. It may be achieved by a change in improvement in the following areas :

(a) Design of methods of production;

(b) Design of machinery, tools and equipments;

(c) Standardisation of methods;

(d) Layout of building, machinery, transport equipment etc.

2. Factory organization and production methods:

The scope of cost reduction in this area is also very high. For instance, the area of control for cost reduction programme includes:

(a) Material purchase, receiving, inspection, storage, handling stock etc;

(b) Recruitment, training, promotion, methods of remuneration to labour;

(c) Overhead;

(d) Production planning and control;

(e) Tools storage, maintenance and control;

(f) Maintenance of transport equipment;

(g) System analysis;

(h) Suitable working conditions.

3. Administration : Since cost reduction is a top management matter, there is enormous scope of cost reduction in this area. This includes the following:

(a) Reorganising the office, assessing the effectiveness of existing staff;

(b) Rationale of certain expenses, e.g. overtime wages, traveling, use of company car etc.;

(c) Ckecking possible misuse by appointing Vigilance Inspectors.

4. Marketing : By rationale thinking and joint efforts much economy can be achieved in this area also. Market research, advertisement, sales office, warehousing, packing, distribution, after-sale service etc. are the areas where cost reduction programme can be undertaken.

5. Finance : Cost reduction may be extended to the use of finance by better utilization of fixed assets and working capital. Savings in capital may be achieved in :

(a) Better utilization of fixed assets employed;

(b) Disposal of uneconomical fixed assets and reinvestment of the said fund in profitable channel;

(c) Non-acquisition of fixed assets where chances of obsolescence are high;

(d) Better inventory control;

(e) Better credit control;

(f) Increased productivity by raising the level of capacity utilization.

3.6 DISTINCTION BETWEEN COST CONTROL AND COST REDUCTION

Cost Control	Cost Reduction
1. Aims at achieving pre-determined targets. The goal is to attain targets.	1. Aims at achieving a real and permanent reduction is cost. The goal is to improve the standards.
2. The process of cost control is to set target, ascertain actual performance, and compare it with target, investigate the variances and minimize them.	2. It is not concerned with maintenance of performance according to standards. It challenges standards.
3. Emphasis is on present and past.	3. Emphasis is on present and future.
4. Seeks to attain lowest cost possible under existing conditions.	4. Recognises no conditions as permanent, since a change will result in a lower-cost.
5. Usually limited to items which have standards.	5. Applied to every section of the business.
6. It tends to set up a conservative procedure and lacks dynamism.	6. It is a continuous process searching for alternatives all the times and is innovative.
7. It is a preventive function; costs are optimised before they are incurred.	7. It is a contractive function and does operate even when a cost control system exists.
8. It is management by directive dictating how to do a thing.	8. It adds thinking to doing at all levels of management.
9. It represents efforts made towards achieving a target or goal.	9. It represents achievement in reduction of costs in all efforts to reach the goal.

3.7 TECHNIQUE TO CONTROL AND REDUCE COSTS

Different management techniques are used to facilitate the work of cost control and reduction. Some are formal techniques while others are based only on careful observations of physical conditions during daily operations. Others are more refined and formal- results of accounting and statistical analyses or engineering analyses. None of these techniques is considered as the only control and reduction device. In fact, combined techniques are used to complement each other to appropriate cost problem. The important techniques which are utilized to control cost are explained below:

1. Budgetary Control : The budget is the fundamental model of accounting for cost control. By setting goals in advance, it assigns these goals to the operating managers. Some functional budgets are established relating to the responsibilities of executives and an overall master budget too. The actual performance is continuously compared with the budgeted plan or targets expressed in money terms. By adopting the concept of flexible or variable budgeting, the control machinery is made more effective.

2. Standard Costing : Standard Costing develops standards with regard to the three major elements of cost-materials, direct labor and overheads, and then computes variances by measuring the actual performance against the predetermined standards. The fundamental of standard costing is measurement and analysis of variances.

3. Control Ratios : For the purpose cost control, it is often useful to ascertain ratios from accounting data. These provide management with information necessary for their control work. These ratios facilitate intra-firm and inter-firm comparisons and thus locate areas where a certain firm's performance is below the ordinary level, as also the average level attained earlier by itself. Some of the important control ratios are:

(i) $$Capacity\ ratio = \frac{Actual\ hours\ worked}{Budgeted\ hours} x100$$

(ii) $$Activity\ ratio = \frac{Allowed\ hours}{Budgeted\ hours} x100$$

(iii) $$Efficiency\ ratio = \frac{Allowed\ hours}{Actual\ hours\ hours} \times 100$$

4. Value Analysis : The Value Analysis has emerged as a powerful technique to reduce costs. It has also been recognized as the most appropriate, effective and organized methodologies to ensure better cost effectiveness in organization. By analysing the value of goods and services purchased in relation to their use, an attempt is made to substitute designs, components, and materials of lower cost.

The main idea is to examine the functions which are preferred in the manufacture of a product with a view to improve the value. The knowledge of value, functions and cost factors serves to control costs and wastes. The relationship may be expressed as :

$$Value = \frac{Function}{Cost}$$

Two general conceptual tools are basic in the operation of a Value Analysis Programme.

(i) Design analysis of the required material;

(ii) Cost analysis of the required material.

Therefore value may be equivalent to function/ cost or worth/ price. Value can be improved by :

(i) improving function, while the cost remains same.

(ii) Reducing costs while the functions remain same or

(iii) Improving functions and reducing costs simultaneously.

3.8 ADVANTAGES OF COST REDUCTION

The following are the advantages or benefits on cost reduction:

1. To the Business Concern

(i) Cost reduction raises profit and provides a basis for higher dividends to the shareholders, more bonus to staff and more retention of profit.

(ii) Management may spend more for better amenities to labor. This will create an improved relation between management and staff and thus reduce labor turnover.

(iii) Because of above two benefits, it creates greater confidence and goodwill.

2. To the industry

Reduced cost is an important indicator or of productivity and thus efficiency. Hence members of the industry may gain from the experience of the more efficient firm and in this manner the entire industry may be benefited.

3. To the nation

(i) Higher profit will result into more revenue to the Government by way of taxation.

(ii) Higher revenue may result in more spending on development programmes of the country.

(iii) As a consequence of reduction in cost, export prices may be reduced which may lead to higher and higher exports.

3.9 DANGERS OF COST REDUCTION EFFORTS

Cost reduction is a useful and effective device to reduce costs in a real way. The ultimate benefits are quite attractive, in the form of reduced expenditure, better cost consciousness among employees, and higher profits for further growth and development. But on the other hand, some dangers need to looked into carefully.

1. Sacrificing overall goals : It may so happen that a department may resort to certain measures which might be beneficial from its own viewpoint, but not from the organizational point of view.

2. Sacrificing quality : In efforts to reduce costs, there is every possibility of the product quality might be sacrificed.

3. Sacrificing employee morale : At the beginning, employees may start to look at cost reduction programmes with scepticism. It may be termed as another attempt to utilize them to increase the profits of the organization without any personal payoffs.

4. Crash programme, Panic : The pgorammes may be taken up by management hurriedly. It might be put into motion as a last resort viz. when there is a serious cash crunch or when losses mount up seriously. Such panic measures do not yield the desired results.

Such dangers can be timely avoided if the cost reduction programme is implemented systematically. It should not be put into operation as an emergency measure when things go out of hand.

All employees must actively participate and they must have the confidence that the payoffs are going to be substantial.

3.10 COST REDUCTIION - ITS ORGANISATION

The areas and scope of cost reduction are so vast that there should be a systematic and co-ordinated approach to the problem. Generally, in a big concern Cost Reduction Committee is constituted with departmental heads and top executives for designing and administration of cost reduction programme.

In other concerns, one of the executives may be assigned the responsibility or a Cost Reduction Officer may be appointed. But irrespective of the type of machinery, an all-round co-operation from the sections of the organsiation is essential. Moreover it must be planned and followed up by an authorized machinery.

The drive for a cost reduction programme may be initiated by :

1. **Top management :** Generally the programme is initiated by the top management. But although the policy is announced from the top level, its execution and realization should be materialized in the interest of the organization.

2. **Large firms :** Sometimes smaller companies might be compelled to be more efficient to supply components at the prices laid down by large firms. The components might be the entire output of the company. After securing details of relative cost, pressure may be put by the customer firm for cost reduction.

3. **Outside Agencies** like Government Trade Association etc.

3.11 PINTS TO REMEMBER

Cost control attempts to bring the actuals in harmony with pre-determined targets. If it materializes assuming no increase or decrease in costs the profit margin becomes more or less stable at a particular level of sales.

Cost reduction aims to achieve a permanent reduction in costs, without impairing the quality of the product.

Cost reduction and control is a total task and an all-performing job that must affect every phase of the business from inquiry to invoice. Therefore, the successful programme is applied with equal weightage to every unit, section, department and division.

The scope of cost reduction is very vast. Every segment of an organisation is involved in this programme. Cost reduction may be implemented in the areas like design, factory organisation and production methods, administration, marketing and finance.

Important techniques which are utilized to control and reduce costs are budgetary control, standard costing, control ratios and value analysis.

3.12. KEY WORDS

Value Analysis : It is recognized as a powerful technique to reduce costs. By analyzing the value of goods and service purchased in relation to their use, an attempt is made to substitute designs, components and materials of lower cost.

Budgetary Control : It is the process of exercising control through establishment of flexible budgets, continuous comparison of actual performance with the budgeted plan or targets expressed in money terms and taking recourse to remedial measures.

3.13 SELF-ASSESSMENT QUESTIONS

1. Explain the meaning of cost reduction and cost control. What are the objectives of cost reduction?

2. Discuss about the scope of cost reduction. What are the major areas in which cost reduction is usually possible?

3. "Cost control does not necessarily aim at a reduction in cost. Its object is more to ensure the maximum utility of the costs incurred". Discuss to what extent you agree with this statement.

4. Differentiate between cost reduction and cost control.

5. Describe the principles of cost reduction and control.

6. Narrate the different techniques of controlling and reducing costs.

7. Explain the concept of value analysis as a technique of cost reduction.

8. Analyze the advantages that are derived by various parties because of implementation of cost reduction in business or industrial concerns.

9. State the difficulties which are generally encountered by management in implementing cost reduction programme in their organizations.

10. Write short notes on :

    (a) Value Analysis;

    (b) Budgetary Control; and

    (c) Control Ratios.

3.14 FURTHER READING

Rao, V.S.P., "Cost Accounting",

Vrinda Publications (P) Ltd., Delhi.

BLOCK - 2

OPERATING COSTING
PROCESS COSTING
RECONCILIATION OF COST AND FINANCIAL ACCOUNTS

This Block comprises three units.

UNIT -1 : CONCEPT OF OPERATING COSTING, OPERATING CONSTING IN TRANSPORT AND POWER HOUSE.

Structure

1.0 Objectives

After studying this unit, you should be able to :

- Explain the definition of Operating Costing.
- Describe the objectives of Transport Costing.

- Narrate the compositions of costs in Transport Costing.
- Prepare Operating Cost sheet of Transport Undertakings.
- Discuss the concept of Power House Costing.
- Prepare Power House Cost Sheet.

1.1 CONCEPT OF OPERATING COSTING

Operating cost means the cost of rendering a service. The term "operating" indicates the cost procedure applied for determining the cost per unit of service rendered. Opearting costing is thus also known as service costing. Operating costing is practised by those business and industries which render service to consumers: for instance, transport services, utility services like canteens, hospitals etc. and distribution service like supply of electricity, gas etc.

According to Wheldon - operating costing is unit costing as applied to the costing of services. The method of ascertaining operating cost is quite simple and easy. The expenses of providing a service during a particular period are classified under suitable headings like fixed, semi-fixed and variable expenses and then their total amount is divided by the number of service units for the same period. This would resultantly give the cost per unit of service.

Cost Unit : The selection of cost unit in operating costing is complicated. This may be simple cost unit or composite cost unit, the unit for example is per km, per bed, per mea etc. In composite cost unit, more than one unit would be combined as shown below:

Undertaking	**Cost unit**
Passenger transport	Per passenger km.
Goods transport	Per quintal- km. Or Per tonne-km.
Electricity	Per Kilowatt - hour
Hospital	Per patient bed or Per patient day / week
Water Supply	Per 1,000 gallons
Canteen	Per meal

Cinema / Theatre	Per man show
Gas works	Per 1,000 cubic feet produced
Boiler House	Per thousand Kg. of steam

1.2 TRANSPORT COSTING - OBJECTIVES

Transport services are performed by roadways, railways, goods carriers, steamers etc. Such business concerns use operating costing in order to find out the total cost of each vehicle and then applying it to the unit cost. The cost information helps in charging for the services against departments and customers. It also aids in comparing among the vehicles and then applying it to the cost unit.

It further helps in making comparison of alternative modes of transport. Of course, the service rendered by the transport carrier depends upon:

(a) the scientific routing of vehicles,

(b) the use of vehicles of proper type and capacity,

(c) the supervision of the time taken for journeys of known mileage, and

(d) the possibility of return loads so as to minimize empty return journeys.

OBJECTIVES

The objectives of transport costing are :

1. Controlling the operating and running costs and avoiding wastage of all types.
2. Quoting hire charges for clients who require the transport service.
3. Making comparison of the cost of running a vehicle with similar vehicles.
4. Ascertaining the cost of services rendered to other departments.
5. Calculating the cost of idle vehicles.

1.3. COMPOSITION OF COSTS

The total costs in respect of transport costing may be divided into the following three heads:

1. **Standing or Fixed charges :** Standing charges have to be incurred whether the vehicle operates or not. These are more or less fixed in nature. The vehicle may be idle, but even then its expenses have to be incurred. The following are the examples of these expenses:

   (i) License fees
   (ii) Road tax
   (iii) Insurance premium
   (iv) Garage rent
   (v) Apportionment of supervision cost
   (vi) Interest on capital
   (vii) Depreciation (if based on time)

2.. **Operating and Running Cost :** The expenses which are incurred on the actual running of the vehicles, are called operating and running cost. These expenses vary from time to time and even come to zero when the vehicles are off the road. These are variable in nature. The following are the examples of these expenses:

   (i) Petrol and fuel
   (ii) Oil
   (iii) Grease
   (iv) Wages of driver, conductor, attendant
   (v) Depreciation (if allocated on the basis of mileage run)

3. **Maintenance charges :** These expenses are incurred on the repairs and maintenance of vehicles. These are semi-variable in nature and the examples thereof are :

   (i) Wear and tear of tyres
   (ii) Repairs and renewals
   (iii) Tyres and tubes
   (iv) Garage expenses
   (v) Overhaul
   (vi) Cleaning
   (vii) Painting
   (viii) Hire of spare vehicles when the firm's own vehicles are under repair.

1.4 COLLECTION OF COSTS

The procedure followed for this purpose is almost like Job or Contract Costing. Each vehicle is allotted a distinct number and all the basic documents will have the assigned number of respective vehicles. A separate Daily Log Sheet for each vehicle is kept by the concerned driver. It records the details regarding the operation of a vehicle during a given period. For calculating the cost of services, it is necessary to know the capital maintenance and running charges, Oil and fuel used, trips made, time spent by employees at various levels, delay etc. These data help management in improving the operational efficiency, in respect of different vehicles under its control.

1.5 ASCERTAINMENT OF COSTS

Total fixed costs, maintenance costs and running costs are collected and allocated under the respective heads and then divided by total units e.g. ton km. Or passengers carried, to arrive at the per unit average cost. A specimen proforma of cost sheet for ascertainment of costs is given here.

TRANSPORT COMPANY
Cost Sheet
For the month of ……..

Vehicle No.	7068	245	Total
Capacity (Quintals)			
Expenses			
A. Standing Charges :			
Insurance			
Rod Tax			
Licence fees			
General supervision			
Interest on Capital			
Total			
Vehicle No.	7068	245	Total
Capacity (Quintals)			
Expenses			

B.	**Maintenance Charges**:		
	Tyres and tubes		
	Garage rent		
	Repairs		
	Paintings		
	Overheauls		
	Total		
C.	**Running Charges :**		
	Petrol		
	Engine oil		
	Lubricating oil		
	Grease etc.		
	Depreciation (on mileage basis)		
	Total		
	Grand Total (A+B+C)		
	D. Quintals - kms. Run		
	E. Cost per Quintal - km.		

1.6 ILLUSTRATIONS

Illustration - 1

From the following data relating to a tempo compute the cost per running km.

Kms. Run (annual)	---	20,000
Kms. Run per litre	---	25
Estimated life in Kms.	---	1,20,000
Cost of vehicle	---	Rs. 30,000
Road Licence (annual)	---	Rs.1,000
Insurance (annual)	---	Rs.800
Garage rent (annual)	---	Rs.500
Supervision (annual)	---	Rs.1,500
Driver's wages per hour	---	Rs.5
Cost of petrol per litre	---	Rs.2
Repairs and maintenance per km.	---	Rs.1.50
Tyre allocation per km.	---	Rs.0.75

You are to charge interest on the cost of vehicle at 5% per annum. The vehicle runs 25 kms. Per hour on an average.

Solution:

Statement of cost per running km.

A. Fixed cost (per annum) :		Rs
Road license	---	1,000
Insurance	---	800
Garage Rent	---	500
Supervision	---	1,500
Interest @ 5%	---	1,500
Fixed costs per annum	---	5,300
Kms. Run per annum	---	20,000
Fixed cost per km. (A)	---	0.265

B. Variable cost per km. :		**Rs.**
Driver's wages (Rs. 5 per hour for 25 kms.)	---	0.200
Cost of petrol per km. (2/25)	---	0.080
Repairs and maintenance	---	1.500
Tyre allocation	---	0.750
Depreciation (Rs.30,000/1,20,000 km)	---	0.250
Variable cost per km. (B)	---	2.780
Running cost per km. (A+B)	---	3.045

Illustration - 2

The Popular Transport Company provides the following details in respect of a truck of 5 tonne capacity:

Cost of truck	---	Rs. 90,000
Estimated life	---	10 years
Diesel, oil, grease	—	Rs. 15 per trip each way
Repairs and maintenance	---	Rs. 500 per month
Driver's wages	---	Rs. 500 per month
Cleaner's wages	---	Rs. 250 per month
Insurance	---	Rs. 4,800 per year
Tax	---	Rs. 2,400 per year
General supervision charges	---	Rs. 4,800 per year

The truck carries goods to and from city covering a distance of 50 kms. each way.

On outward trip freight is available to the extent of full capacity and on return 20% of capacity.

Assuming that the truck runs on an average 25 days a month, work out :

(a) Operating cost per tonne-km.

(b) Rate per tonne per trip that the company should charge if a profit of 50% on freight is to be earned.

Solution :

Popular Transport Co.

Statement of operating costs per truck (Tonnes-kms. 7,500)

		Costs	
	Per month	**Per tonne-km.**	
	Rs.	Rs.	Rs.
Fixed costs :			
Driver's wages	--- 500		
Cleaner's wages	--- 250		
Insurance	--- 400		
Taxes	--- 200		
General supervision	--- 400		
		1,750	**0,233**
Variable running costs :			
Diesel, oil, grease	--- 750		
Depreciation	--- 750		
Repairs & maintenance	--- 500		
		2,000	**0.267**
(a) Operating Cost :	---	**3,750**	**Re. 0.500**
(b) Freight rate :			
Cost per tonne-km.	Re. 0.50		
Profit per tonne-km.	0.50		
	Re.1.00		

Freight per trip-both ways 300 tonne-kms. @ Re.1.00--- Rs. 300

(Truck makes only one trip a day, tonne-kms. Covered in a trip would be 7,500/25)

Working Notes:

1. Tonne-Kms. Per month

   6 tonnes x 50 kms. X 25 days = 7,500 tonne-Kms.

   5 tonnes on outward trip and one tonne on return trip

   Outward trip tonne-Kms. 5 x 50 x 25 = 6,250

   Inward trip tonne-Kms. 1 x 50 x 25 = 1,250

   Total --- 7,500

2. It is assumed that the truck makes only one trip per day.

3. The scrapvalue of the truck is assumed to be nil. Hence the total amount to be depreciated in a year is Rs.90,000/10 = Rs.9,000

Illustration - 3

The Kaziranga Transport Company is running four buses between two towns which are fifty Kilometers apart. Seating capacity of each bus is 40 passengers.

The following particulars were obtained from their books for a particular month of a year:

		Rs.
Salaries of office and supervisory staff	---	20,000
Wages of drivers, conductors and clearners	---	30,000
Diesel oil and other oils	---	10,000
Repairs and Maintenance	---	3,000
Taxation, Insurance etc.	---	2,500
Depreciation (on Kms. Basis)	---	4,000
Interest and other charges	---	3,500

Actual passengers carried were 75% of the seating capacity. All the four buses run 30 days in the month, each bus made one round trip per day.

Prepare on Operating Cost Sheet for the month showing the cost per passenger - km.

Solution : **The Kaziranga Transport Co.**

Operating Cost Sheet

For the moth of ……

			Rs.
A. Standing Charges :			
Taxation, Insurance etc.	---		2,500
Interest and other charges	---		3,500
	Total	**---**	**6,000**
B. Maintenance Charges :			
Salaries of office and supervisory staff			20,000
Repairs and Maintenance			3,000
	Total	**---**	**23,000**
C. Running Charges :			**Rs.**
Diesel oil and other oils		---	10,000
Wages of drivers, conductors and cleaners		---	30,000
Depreciation (on Kms. Basis)		---	4,000
	Total	**---**	**44,000**
Operating Cost (A+B+C)		---	73,000

$$\text{Cost per Passenger - Km} = \frac{73,000}{3,60,000} = \text{Re. } 0.2027$$

Working Notes :

Passenger = No. of Trips per day x No. of days in a month x percentage of capacity x Km. per tirp.

= 4 x 1 x 30 (75% of 40) x (50 x2)

= 4 x 1 x 30 x 30 x 100

= 3,60,000 passenger - Kms.

Illustration - 4

Sri A.K. Choudhury owns a fleet of taxis and the following information is available from the records maintained by him :

Number of each taxi	---	10
Cost of each taxi	---	Rs. 3,00,000
Salary of manager	---	Rs. 5,000 p.m.
Salary of accountant	---	Rs. 3,000 p.m.
Salary of mechanic	---	Rs. 2,000 p.m.
Salary of cleaner	---	Rs. 1,000 p.m.
Garage rent	---	Rs. 1,000 p.m.
Insurance Premium	---	5 % per annum
Annual tax	---	Rs. 2,400 per taxi
Driver's salary	—	Rs. 2,000 p.m. per taxi
Annual repair	---	Rs. 2,000 per taxi.

Total life of a taxi is about 2,00,000 kms. A taxi runs in all 3,000 km. in a month of which 30% it runs empty. Petrol consumption is one litre for 10 km @ Rs. 50 per litre. Oil and other sundries are Rs. 50 per 100 km. Calculate the cost of running a taxi per km.

Solution :

Operating Cost Sheet for the period……

				Per Km Rs.
			Rs.	
Rs.				
Fixed cost per month (for 10 taxis)				
Manager's salary	---	5,000		
Accountant's salary	---	3,000		
Salary of cleaner	---	1,000		
Salary of mechanic	---	2,000		
Garage Rent	---	1,000		
Total Fixed Cost	**---**	**12,000**		
Fixed cost per taxi (Rs. 12,000 ÷10)			1,200	
Insurance premium (3,000,000 x 5/100 x ½)			1,250	
Taxes (Rs. 2,400 ÷ 12)	---		200	
Driver's salary	---		2,000	
			4,650	
Fixed cost per taxi per km. (Rs. 4,650 ÷ 2,100)				2.20
Variable cost per km. :				
(a) Depreciation (per effective km.)				
[3,00,000 ÷ 2,00,000 x 70/100]				1.05

(b) Petrol per month [50/10 x 3,000] = Rs. 15,000

Per effective Km. = $\frac{15,000}{2,100}$ = Rs. 7.14 — 7.14

(c) Repair ($\frac{2,000}{2,100} \times \frac{1}{12}$) — 0.08

(d) Oil and other sundries (1,500 ÷ 2,100) — 0.71

Cost per km. per taxi --- 11.18

* Note : A taxi runs 30% empty and thus its effective run is only 70%. All costs have been calculated taking into consideration its effective km.

Illustration - 5

Prepare a Cost Sheet for the unit cost per passenger --- km for a fleet of passenger buses run by a Transport Company from the following figures extracted from its books :

5 passenger buses costing Rs. 50,000 : Rs. 1,20,000; Rs. 45,000; Rs. 55,000 and Rs. 80,00 respectively. Yearly depreciation of vehicles 20A% of the cost.

Annual repair, maintenance and spare parts - 80% of depreciation.

Wages of 10 drivers	@ Rs. 100 each per month
Wages of 20 cleaners	@ Rs. 50 each per month
Yearly rate of interest	@ 4% on capital
Rent of six garages	@ Rs. 50 each per month
Director's fees	@ Rs. 400 per month
Office establishment	@ Rs. 1,000 per month
Licence and taxes	@ Rs. 1,000 every six months.
Relisation by sale of old tyres and tubes	@ Rs. 3,200 every six month

900 passengers were carried over 1,600 Kms. during the year.

Solution :

Cost of buses = (Rs. 50,000 + 1,20,000 + 45,000 + 55,000 + 80,000)

= Rs. 3,50,000

Yearly depreciation (20% of cost) = Rs. 70,000

Yearly repairs (80% of depreciation) = Rs. 56,000

Operating Cost Sheet for the year.....

	Rs.	Rs.
A. Standing Charges :		
Wages of drivers (10 x 100 x 12) ---	12,000	
Wages of cleaners (20 x 50 x12) ---	12,000	
		24,000
Interest (4% on Capital) ---		14,000
Director's fees (400 x 12) ---		4,800
Office Establishment (1,000 x 12) ---		12,000
Licence and Taxes (1,000 x 2) ---		2,000
Total		**56,800**

		Rs.
B. Maintenance Charges :		
Garage Rent (6 x 50 x 12) ---		3,600
Repairs, Spare parts etc.	56,000	
Less : Sale proceeds of old tyres, tubes	6,400	
		49,600
		53,200
C. Operating Charges :		
Depreciation		70,000
D. Grand Total (A + B + C) ---		1,80,000
E. Passenger - Kms. carried (900 x 1,600) ---		14,40,000
F. Cost per Passenger - Km. (1,80,000 ÷ 14,40,000)		0.125

1.7 POWER HOUSES COSTING

Power houses also adopt operating costing. Their objective is to ascertain the total cost and per unit cost of

generating steam or electricity for fixing departmental charges and outside tariffs. The details of constituent elements of cost are furnished by the cost office whereas technical data viz., steam pressure, meter-reading, evaporation, factory heating, turbines, losses etc. are supplied by the engineering department. But the important point is that costs need to be built up and analysed are not only meant for cost finding, but also equally important for controlling them. Standards of expenditure should be established under each major head on the basis of detailed studies.

The **main heads of expenditure** for an undertaking like power house are as under :

(i) Water-cost of supply, purification and softening.

(ii) Fuel-coal or oil, including its cartage, handling and storage.

(iii) Indirect materials - service materials, and small tools.

(iv) Labour - wage of coal handlers, stockers and ash removers.

(v) Overhead costs - rent, rates, depreciation, insurance and interest on capital.

(vi) Supervision - Wages of foremen and salary of the works manager.

(vii) Maintenance - furnace repairs, renewal of fire bars, replacement of fire iron etc.

1.8 POWER HOUSE COST SHEET

Boiler House Cost Sheet

Month Total Steam Produced Particulars	Total Consumption	
	Cost per 1000 Ib.	Total cost
1	**2**	**3**
A. Fixed Overheads : Rent, Rates etc. Depreciation of Plant Depreciation of Building Insurance		

1	2	3
B. Maintenance Charges :		
Meters		
Furnace		
Service materials		
Tools and accessories		
C. Labour Charges :		
Coal handlers		
Ash removers		
D. Fuel :		
Fuel		
Power		
E. Water Charges :		
Water purchased		
Water softening		
F. Supervision and other charges :		
Engineers		
Foremen		
General labour		
Cleaners		
Total		

1.9 ILLUSTRATIONS

Illustration - 1

From the following data pertaining to a certain year, prepare an Operating Cost Sheet showing the cost of electricity generated per Kwh. By the Popular Thermal Power Station :

Total units generated	---	10,00,000 Kwh.
Operating labour	---	Rs. 50,000
Repairs and maintenance	---	Rs. 50,000
Lubricants, spares and stores	---	Rs. 40,000
Plant supervision	---	Rs. 30,000

Administrative overheads	---	Rs. 20,000

Coal consumed per Kwh. for the year 2.5 kg. @ Re0.05 per kg.

Charge depreciation @ 10% on capital cost of Rs. 2,00,000.

Solution : [Units generated : 10,00,000 Kwh.]

Operating Cost Sheet

		Total	Per Kwh.
		Rs.	Rs.
Fixed Expenses :			
Plant supervision	---	30,000	
Administrative overhead	---	20,000	
		50,000	0.05
Variable Expenses :			
Operating labour	---	50,000	0.05
Repairs & maintenance	---	50,000	0.05
Lubricants, spares, stores	---	40,000	0.04
Coal consumed	---		0.05
Depreciation	---		0.02
Cost per Kwh.			0.26

Illustration - 2

The following cost data pertaining to a year have been collected from the books of the Amrit Power Co. Ltd. Prepare a Cost Sheet showing the cost of generation of power per unit of Kwts.

Total units generated	---	15,00,000 Kwts.
		Rs.
Capital cost	---	1,50,000
Operating labour	---	16,500
Plant supervision	---	5,250
Lubricant and supplies	---	10,500
Repairs and Maintenance	---	21,000
Administration overhead	---	9,000

Coal consumed per Kwt. is 1.5 lbs and cost of coal delivered to the Power Station is Rs. 33.06 per metric tonne. Depreciation rate chargeable is 4% p.a. and interest on capital is to be taken at 7%.

Solution : Power House Cost Sheet

Particulars		**Cost Per Kwts.**		
1		2		3
Fixed Charges :		Rs.	Rs	Rs.
Plant supervision	---	5,250		
Administration overhead	---	9,000		
Interest @ 7%	---	10,500		
			24,750	0.0165
Variable costs :				
Coal : $\frac{1.5 \text{ lbs} \times 15,00,000 \times 33.06}{2205}$		= 33,750		2.25
Depreciation : (4% on Rs.1,50,000)		6,000		0.40
Operating Labour		= 16,500		1.10
Lubricant supplies		= 10,500		0.70
Repairs & Maintenance		= 21,000		
			87,750	0.0585
	Total ---		1,12,500	0.0750

1.10 POINTS TO REMEMBER

Operating costing refers to the cost procedure applied for determining the cost per unit of service rendered by transport services, utility services like hospitals, electricity, Gas supply, canteens etc.

The objectives of transport costing are - controlling operating and running costs, quoting hire charges for clients seeking transport service, making comparison of the cost of running a vehicle with similar other vehicles and ascertaining the cost of services rendered to other departments.

A separate Daily Log Sheet for each vehicle is kept wherein various details regarding the operation of a vehicle during a specified period are recorded. Costs are collected on the basis of the details of each vehicle as contained in the Daily Log Sheet.

The main heads of expenditure for a power house are : water, fuel, indirect materials, labour, overhead costs, supervision and maintenance.

1.11 KEY WORDS

Cost Unit : It is a quantitative unit of product or service in relation to which costs are ascertained. For ascertainment of costs, they are expressed in terms of physical measurement like number, weight, volume, area, length or any other convenient units.

Composite cost unit : When a single type unit does not serve the desired purpose, composite units may be used for cost measurement. For instance, in transport costing-pasenger - miles or ton-miles are better measures than only passengers or tons.

1.12 SELF ASSESSMENT QUESTIONS

1. What is operating costing? To what industries is this method applicable?
2. What is Operating Cost? Prepare a statement with imaginary figures for working out the running cost per kilometer of a taxi.
3. Explain the objectives of Transport Costing.
4. Discuss, in detail, the composition of costs in case of transport costing.
5. How collection of costs is done in transport costing?
6. Prepare a proforma of Daily Log Sheet.
7. Explain what do you understand by cost unit and composite cost unit.

8. Prepare a Power House Cost Sheet with imaginary figures.

9. A transport company is running two buses between two places 100 km apart. Seating capacity of each bus is 50 passengers. The following information have been obtained from their books for a month.

		Rs.
Salary of supervisor and office staff	---	15,000
Wages of drivers, conductors and cleaners	---	30,000
Diesel, Oil etc.	---	20,000
Repairs and maintenance	---	4,000
Taxation and insurance	---	2,000
Depreciation	---	3,000
Interest and other charges	---	3,000

Actual passengers traveled were 80% of the capacity. The buses ran on all the days. Each bus made a to and fro trip.

Find out the cost per passenger - Kilometer.

10. from the following data pertaining to a year, prepare a Cost Sheet showing the cost of electricity generated per unit of Kwh. by the Asom Valley Thermal Power Station.

Total Units generated	---	20,00,000 Kwts.
Plant supervision	---	Rs. 30,000
Operating labour	---	Rs.50,000
Lubricants, Spares and stores	---	Rs. 40,000
Administration overheads	---	Rs.20,000
Repairs and Maintenance	---	Rs.50,000

Coal consumed per Kwh. for the year is 2.5 kg. @ Rs.4.00 per kg.

Depreciation charge @ 5% on Capital Cost of Rs.20,00,000.

1.14 FURTHER READINGS

Banerjee, B. "cost Accounting",
The World Press Private Ltd., Kolkata.

Lal Nigam, B.M. "Theory and Techniques of Cost Accounting",
& Himalaya Publishing House, Mumbai.

Sharma , G.L.,

BLOCK - 2

UNIT - 2 : PROCESS COSTING, INTER-PROCESS PROFITS, BY-PRODUCT AND JOINT PRODUCTS

Structure

2.0 Objectives

After studying this unit you should be able to :

- Define the meaning of Process Costing.
- State the features and applicability of Process Costing.

- Distinguish between Job Costing and Process Costing.
- Explain the principles of Process Costing.
- Describe the normal wastage and abnormal wastage and their accounting treatment.
- Identify the Inter-Process Profits, Joint Products and By- Products and their accounting treatment.

2.1 PROCESS COSTING : INTRODUCTION

Process costing is a method of costing applied to industries in which the material has to pass through two or more processes before being converted into a finished product. The different processes are in a sequential order so that the output of the earlier stage becomes the input of the succeeding stage, and then the out put of the final stage becomes the finished product.

In such industries output consists of like units, each unit being processed in the identical manner. Hence it is assumed that the same amount of raw materials, labour and overhead is chargeable to each unit that has been processed. The record of units produced is known and costs are accumulated process-wise. The cost of a unit at the end of a manufacturing process is ascertained viz., dividing the total cost of a process by the number of units produced in that process.

2.2 APPLICABILITY OF PROCESS COSTING

Process costing is applied in the following categories of industries:

1. **Manufacturing industries :** Cement, iron and steel, automobile plants, paper, rubber ceramics, ice, paints industries etc.
2. **Mining:** Mineral oil, coal, iron, gold, sulphur, zinc, gas etc.
3. **Chemical industries :** Oil, chemicals, medicines, soap, perfumery etc.
4. **Public Utility Works :** Water supply, gas supply, generation and distribution of electricity.

2.3 ESSENTIAL CHARACTERISTICS OF PROCESS COSTING

The essential characteristics of process costing are as follows:

1. The production is continuous and the end product is the result of a sequence of processes.
2. The products are homogeneous and standardized.
3. The sequence of operation for processing the product is specific and pre-determined.
4. The products are not distinguishable in processing stage.
5. The finished product of each but last process becomes the raw material for the next process and that of the last process is transferred to the stock of finished goods.
6. Some loss of materials in processes is unavoidable due to evaporation, chemical action etc.
7. Costs are accumulated process-wise.
8. The cost per unit produced is the average cost and is calculated by dividing the total process cost by the number of units produced.

2.4 DISTINCTION BETWEEN JOB COSTING AND PROCES COSTING

The main points of difference between job costing and process costing are as under:

Job Costing	Process Costing
1. Production is against specific orders.	1. Production is continuous and the products are homogeneous.
2. Each job is separate and independent of others.	2. Since production is continuous, products lose their individual identity.
3. Costs for each job are determined separately	3. Costs are compiled for each process for a period.
4. Job may or may not have opening or closing work in progress.	4. Since production is continuous, there is always work in progress.
5. Costs are completed when a job is completed.	5. Costs are claculated at the end of the cost period.
6. There are usually no transfers from one job to another unless there is excess production	6. Transfer of costs from one process to another is made, as the product moves from one process to another.
7. Each job is dissimilar as production is against specific individual orders.	7. Since the production process is standardised, products are uniform and similar.
8. Cost control is more or less difficult as each product unit is different and the production is not continuous.	8. Cost control is comparatively easier, as the production is standardised and is more stable.

2.5 GENERAL PRINCIPLES OF PROCESS COSTING

The general principles followed in cost determination under process costing are stated as follows :

1. In process costing, a separate account is kept for each process. The account is debited with the value of materials, labour and overheads relating to the process.
2. Direct and indirect costs are accumulated by process or departments at regular intervals. For this purpose, sometimes Process Cost Sheets are used for cost computation.
3. The quantity or physical units of output in each process or departments are recorded in the respective process accounts.
4. The total cost of each process is divided by the total volume of production at the end of each period and consequently the cost per unit of output is determined.
5. The cost of one process is transferred to the next process and charged at an initial cost. The cumulative costs of different departments determine the ultimate total cost and cost per unit of output at the final stage.
6. If there is work in process at the end of a period, the stage of completion of the incomplete work is determined, and the ascertainment of inventory is made in terms of completed units e.g., if twenty units are one half complete, they are taken as equivalent to 10 completed units. The total cost is then divided by the total number of units and the unit cost obtained for the process.
7. In case of loss or spoilage in any process the units produced in the process bear the loss and the average cost per unit of that department is increased.

2.6 ILLUSTRATION - 1

A product passes through three distinct processes to completion. These processes are numbered respectively as I, II and III. During the week ended 15th January, 500 units are produced. The following information have been obtained:

	Process I	Process II	Process III
	Rs.	Rs.	Rs.
Materials	3,000	1,500	1,000
Labour	2,500	2,000	2,500
Direct Expenses	500	100	500

The indirect expenses for the period were Rs.1,400 apportinoed to the processes on the basis of wages.

No work-in-progress or process stocks existed at the beginning or at the end of the week.

Assuming that an order for 100 units included in the output for the week, also prepare the appropriate Production Order.

Solution:

Process - I Account

Week ended 15th Jan. (output : 500 units)

Particulars	Cost per unit	Total cost	Particulars	Cost per unit	Total cost
	Rs.	Rs.		Rs.	Rs.
To materials	6	3,000	By Process - II A/c	13	6,500
To labour	5	2,500	(out put		
To Direct Expenses	1	500	transferred)		
To Indirect Expenses (25 / 70 x Rs. 1,400)	1	500			
	13	6,500		13	6,500

Process - II Account

Particulars	Cost per unit	Total cost	Particulars	Cost per unit	Total cost
		Rs.	Rs.	Rs.	Rs.
To Process - I A/c	13.00	6,500	By Process-III A/c		
To Materials	3.00	1,500	(output transferred)	21.00	10,500
To Labour	4.00	2,000			
To Direct Expenses	0.20	100			
To Indirect Expenses (20/70 x Rs.1,400)	0.80	400			
	21.00	10,500		21.00	10,500

Process - III Account

Particulars	Cost per unit	Total cost	Particulars	Cost per unit	Total cost
	Rs.	Rs.	Rs.	Rs.	
To Process -II A/c	21.00	10,500	By Finished Stock		
To Materials	2.00	1,000	A/c 30.00	15,000	
To Labour	5.00	2,500	(output		
To Direct Expenses	1.00	500	transferred)		
To Indirect Expenses (25/70 x Rs.1,400)	1.00	500			
	30.00	15,000		30.00	15,000

Production Order for 100 units

Particulars	Process - I		Process - II		Pricess - III		Total	
	Cost Per Unit	Total Cost	Cost Per Unit	Total Cost	Cost Per Unit	Total Cost	Cost Per Unit	Total Cost
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
To Materials	6.00	600	3.00	300	2.00	200	11.00	1,100
To Labour	5.00	500	4.00	400	5.00	500	14.00	1,400
To Direct Expenses	1.00	100	0.20	20	1.00	100	2.80	280
To Indirect Expenses	1.00	100	0.80	80	1.00	100	2.80	280
Total Cost	13.00	1,300	8.00	800	9.00	900	30.00	3,000

2.7 NORMAL PROCESS LOSS

It is the loss which is unavoidable on account of inherent nature of material. This is called normal loss. Such loss can be estimated in advance on the basis of past experience or chemical data. The percentage of such losses is also anticipated from past experience. Normal loss should be absorbed by good units arising out of the process. In this manner, the cost of spoiled or lost units is absorbed as an additional cost of good units produced in the process. Normal process losses may included scrap and / or waste. Where scrap possesses some value as a waste product, the value thereof is credited to the Process Account. This resultantly reduces the cost of normal process loss shared by usable good units.

2.8 ILLUSTRATION - 2

The following information is extracted from the Cost Accounts of a Factory producing a commodity in the manufacture of which three processes are involved. Prepare Process Cost Accounts showing the cost of the output and the cost per unit at each stage of manufacture.

(a) The operations in each separate process are completed daily.

(b) The value at which units are to be charged to Processes B and C is the cost per unit of Processes A, A plus B respectively.

		Processes		
		A	B	C
		Rs.	Rs.	Rs.
Direct Wages	---	640	1,200	2,025
Machine Expenses	---	360	300	360
Factory Overhead	---	200	225	240
Raw Materials consumed	---	2,400		
		Units	**Units**	**Units**
Production (Gross)		37,000		
Wastage	---	1,000	1,500	500
Opening Stock	---	---	4,000	16,500
Closing Stock	---	---	1,000	5,500

Solution :

Process A Account

Particulars	Units	Rs.	Particulars	Units	Rs.
To Direct Materials	37,000	2,400	By Normal	1,000	-
To Direct Wages		640	Wastage		
To Machine Expenses		360	By Process B A/c	36,000	3,600
Factory Overhead		200	(Re 0.10 per unit)		
	37,000	3,600		37,000	3,600

Process B Account

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening Stock*	4,000	400	By Normal	1,500	-
(@ Re.0.10 per unit)			Wastage		
To Process A A/c			Closing Stock	1,000	100
(output received)	36,000	3,600	(Re. 0.10 per unit)		
To Direct Wages		1,200			
To Machine Expenses		300	By Process C A/c	37,500	5,625
			(output transferred)		
To Factory Overhead		225	@ Re.0.15 cost		
			per unit)		
	40,000	5,725		40,000	5,725

Process C Account

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening Stock*	16,500	2,475	By Normal	500	-
(@ Re.0.15 per unit)			Wastage*		
To Process A A/c			Closing Stock		
(output received)	36,000	3,600	(Re. 0.10 per unit)	5,500	825
To Direct Wages	2,925				
To Machine Expenses	360		By Finished Stock	48,100	10,000
			(Final output)		
To Factory Overhead	240		(@ Re.0.225 cost		
			per unit)		
	54,000	11,625		54,000	10,825

* Opening stock and closing stocks consists of raw materials. Therefore these are valued at the same rate at which output from the preceding process has bee obtained.

2.9 ABNORMAL PROCESS LOSS

Loss caused bys abonormal or unexpected conditions like accident, carelessness, substandard materials etc. or loss in excess of the anticipated normal process loss is regarded as abnormal process loss. Abnormal loss should not afect the normal cost of production. So, abnormal loss is valued like good units and tranferred to a separate account called Abnormal Loss Account.

The valuation of abnormal loss should be done with the help of the following formula:

$$\frac{\text{Total Cost - Scrap Realized}}{\text{Normal Production}} \times \text{No. of Abnormal Units.}$$

In this way, these losses are segregated from process costs and investigated in order to prevent such occurence in future. The cost of abnormal spoilage is transferred from the process account to the Abnormal Loss Account. A separate account is kept for abnormal losses to which the cost of material, labour and overhead incurred by the wastage is debited; the corresponding credit being given to the process account in which such loss occurs. The abnormal loss account is closed by writing it off to the Costing Profit and Loss Account. In case, abnormal loss is treated as production cost, the cost of production and hence of the products would fluctuate from time to time and would provide a misleading picture to management.

2.10 ILLUSTRATION - 3

In the manufacture of the product "A" 1,000 kgs. of material at Rs.7 per kg. was supplied to the first process. Labour cost amounted to Rs.3,000 and production overhead was Rs.1,000. The normal loss has been estimated at 10% which could be sold at Rs.4 per kg. The actual production of the process was 800 kgs. Prepare Process - I Account.

Solution :

Process - I, Account

Particulars	Qty. kg	Per kg Rs.	Amount Rs.	Particulars	Qty. kg	Per kg. Rs.	Amount Rs.
Direct Materials	1,000	7	7,000		100	4	400
Direct Labour			3,000	Transferred to Process II	800	11.73	9427
Production Ovehead	1,000			Abnormal Loss	100	11.73	1,173
	1,000		11,000		1,000		11,000

Working :

1. Abnormal Loss is calculated as follows:

Normal Production :	**Abnormal Loss :**	**Kg.**
Quantity : 900 Kgs.	Normal Production	900
Cost : Rs. 10,600	Actual Production	800
Actual Production :	**Abnormal loss**	100
Quantity = 800 kg	Cost = $(\frac{10,600}{900} \times 100)$	
Cost = $(\frac{10,600}{900} \times 800)$ = Rs. 9,427	= Rs. 1,173	

2.11. ABNORMAL GAIN OR EFFECTIVENESS

If the actual process loss or wastage is less than the determined percentage of normal loss or wastage, the difference is called abnormal gain or effetiveness.

Like abnormal loss, abnormal gain also should not affect the cost of normal production. The abnormal gain is valued in the same manner as abnormal loss and credited to Abnormal Gain Account.

2.12. ILLUSTRATION - 1

In Process B, 100 units of a commodity were transferred from Process-A at a cost of Rs. 1,500. The additional expenses incurred by the process were Rs. 200. 20% of the units entered are normally loss and sold at Rs.5 each. The output of the process was 90 units.

Prepare Process - B Account.

Solution :

Process B Account

Particulars	Units	Amount Rs.	Particulars	Units	Amount Rs.
To Process A A/c	100	1,500	By Normal Loss (20 units sold @ Rs.5)	20	100
To Additional Expenses		* 200	By Process-C A/c (output)	90	1,800
To Abnormal gain A/C	10	* 200	Cost per unit :		
	100	1,900		100	1,900

* Normal output : Units entered - Normal Loss.
= (100 - 200)
= 80 units

Actual output **= 90 units**
Abnormal gain **= 10 units.**

Valuation of Abnormal Gain :

$$= \frac{\text{Normal Cost of Normal output}}{\text{Normal output}} \times \text{Units of Abnormal Gain}$$

$$= \frac{1,600}{80} \times 10$$

= Rs. 200

Abnormal Gain Account

Particulars	Units	Amount Rs.	Particulars	Units	Amount Rs.
To Normal Loss A/c (Loss of income)	10	50	By Process B A/c	10	200
To costing Profit & Loss-A/C		150			
	10	200		10	200

2.13. INTER-PROCESS PROFITS

In case of some process industries, the output of one process is transferred to the next process not at cost but at market value or plus a percentage of profit. The excess of transfer price over cost is known as inter-process profit. The purpose of this practice is : (i) to show whether cost of production competes with market prices, (ii) to show whether cost of production competes with market prices, (ii) to make each process stand on its own efficiency and economies, i.e., the tranferor process receives the benefit of economies effected by it. The limitation of this practice about this profit included in closing stock of every process. Since the goods are not sold, this profit is unrealized. Therefore it becomes necessary to find out the profit (unrealised) included in closing stock of processes and in the finished stock.

For computing the profit element i closing inventoris and to get the net relised profit for a period, there columns, have

been shown on each side of process accounts. Closing stock hs been deducted from the debit side of process accounts instead of showing it on the credit side. Cost of closing stock can be easily obtained by comparing the accumulated cost and total in any process. The cost of stock can be found by the following formula:

$$\left(= \frac{\text{Cost column}}{\text{Total column}} \times \text{Stock} \right)$$

The profit on closing stock can then be obtained by deducting the cost of stock thus ascertained from the value of stock.

Accounting Adjustments for Inter-Process Profit

For the units sold, the Prift & Loss Account absorbs the difference between the cost and sales value and hence there is no problem. But the problem arises in respect of stock unsold which contains an element of unrealised profit. Therefore, necessary adjustments are made in the value of closing stock by means of a provision of reserve.

2.14 ILLUSTRATION - 5

A product passes through there distinct processes before it is completed. The out put of each process is charged to the next process at a price calculated to give a profit of 20% on transfer price. The output pf Process III is charged to the finished stock account on a similar basis. There was no work-in-progress at the beginning of the year and overheads have been ignored. Stocks in each process have been valued at the price cost of the process. The following data have been obtained at the end of 31st December, 2005.

	Process I	**Process - II**	**Process - III**	**Finished Stock**
	Rs.	Rs.	Rs.	Rs.
Direct Materials	4,000	6,000	2,000	-
Direct Wages	6,000	4,000	8,000	
Stock (31.12.05)	2,000	4,000	6,000	
Sales during 2005	-	-	-	-

From the above information prepare :

(a) Process Cost Accounts showing the profit element at each stage;

(b) Actual realised profit ; and

(c) Stock valuation as would appear in the Balance Sheet.

Solution :

Process - I Account

Particulars	Total Rs.	Cost Rs.	Profit Rs.	Particulars	Total Rs.	Cost Rs.	Profit Rs.
Material	4,000	4,000	-	Process - II A/C	10,000	8,000	2,000
Wages	6,000	6,000		(Transfer)			
Total	10,000	10,000	-				
Less : Closing Stock c/d.	2,000	2*,000	-				
Prime Cost	8,000	8,000					
Gross Profit (25% on cost)	2,000	-	2,000				
	10,000	8,000	2,000		10,000	8,000	2,000

$$\left(\frac{10,000 \times 2,000}{10,000} = \text{Rs. } *2,000\right)$$

Process - II Account

Particulars	Total Rs.	Cost Rs.	Profit Rs.	Particulars	Total Rs.	Cost Rs.	Profit Rs.
Process - I A/c (Transfer)	10,000	8,000	2,000	Process - III A/C (Transfer)	20,000	14,400	5,600
Material	6,000	6,000	-				
Wages	4,000	4,000					
Total	20,000	18,000	2,000				
Less : Closing Stock c/d.	4,000	3*,600	400				
Prime Cost	16,000	14,400	1,600				
Gross Profit (25% on cost)	4,000	-	4,000				
	20,000	14,400	5,600		20,000	14,400	5,600

$$\left(\frac{18,000 \times 14,400}{20,000} = \text{Rs. } *3,600\right)$$

Process - III Account

Particulars	Total Rs.	Cost Rs.	Profit Rs.	Particulars	Total Rs.	Cost Rs.	Profit Rs.
Process - II A/c (Transfer)	20,000	14,000	5,600	Finished stock A/C (Transfer)	30,000	19,520	10,480
Material	2,000	2,000	-				
wages	8,000	8,000					
Total	30,000	24,400	5,600				
Less : Closing Stock c/d.	6,000	4,880	1,120				
Prime Cost	24,000	19,520	4,480				
Gross Profit (25% on cost)	6,000	-	6,000				
	30,000	19,520	10,480		30,000	19,520	10,480

Finished Stock Account

Particulars	Total Rs.	Cost Rs.	Profit Rs.	Particulars	Total Rs.	Cost Rs.	Profit Rs.
Process - III A/c (Transfer)	30,000	19,520	10,480	Sales	36,000	17,568	18,432
Less : Closing Stock A/c.	3,000	*1,952	1,048				
	27,000	17,568	9,432				
Gross Profit	9,000	--	9,000				
	36,000	17,568	18,432		36,000	17,568	18,432

$$\left(\frac{19{,}520 \times 3{,}000}{30{,}000} = \text{Rs. } 1{,}952\right)^{*}$$

(b) Calculation of Actual realised profit :

Particulars	Apparent Profit of Process Rs.	Unrealized Profit in closing stock Rs.	Actual Profit Rs.
Process - I	2,000	---	2,000
Process - II	4,000	400	3,600
Process - III	6,000	1,120	4,880
Finished stock	9,000	1,048	7,952
Total	21,000	2,568	18,432

(c) Stock Valuation for Balance Sheet Purpose :

Cost of closing stock

		Rs.
Process - I	---	2,000
Process - II	--	3,600
Process - III	---	4880
Finished stock	---	1,952
Total	**---**	**12,432**

Check :

	Rs.
Total cost incurred in all Processes ----	30,000
Less : Cost of goods sold	17,568
Cost of closing stock	12,432

2.15 BY-PRODUCT AND ITS ACCOUNTING TREATMENT

In some industries, the production of the main product is accompanised by production of one or more secondary products. for instance, production of sugar is accompanied by bagasse and molasses. Similarly, in oil refinery, processing of crude petroleum yields not only refined oil i.e., the main product, but also some minor products like sulphur, bitumen, chemical, fertilizers etc. These minor, or secondary products are known as "By-products". As such, by product are products of comparatively small value that are produced incidental to then main product.

Valuation of By-product

By-products are produced jointly with other major products and remain inseparable upto the point of split-off. Accordingly, the processing costs upto the split-off point relate to the main product as well as the by-product . Therefore, complicacy arises in the valuation of by-product at the point of split-off.

Valuation of by-products is based on two important considerations:

(i) A by-product is relatively less important than the joint products.

(ii) It has a faily steady market value.

The methods used for valuing by-products may be categorised under :

(i) Non-cost Methods or Sales Value Methods

(ii) Cost Methods.

Non-cost-Methods or Sales Value Methods :

Only the sales value of the by-product is taken into account unde these methods. Therefore, these are known as non-cost methods. The non-cost methods are :

(a) Other income method.
(b) Crediting sales value to total cost.
(c) Crediting sales value less selling and distribution expenses.
(d) Crediting sales value less the cost incurred on by-product after split-off.
(e) Crediting sales valueless profit or reverse cost method.

Cost - Methods :

Under these methods, attempts are made to approtion the joint costs incurred upt the split-off point to the by-products as fairly and accurately as possibe. The cost methods are :

(a) Opportunity or replacement cost method.
(b) Standard cost method
(c) Joint cost method or Apportionment on a suitable basis.

2.16 ILLUSTRATION - 6

In manufacturing the main product, a company processes the incidental waste into two by-products A and B. From the following data relating to the Products, you are required to prepare a comparative profit and loss statement showing the individual costs and other details. The total costs up to separation period was Rs. 3,10,400.

	Main Product	**By-product A**	**By-product B**
	Rs.	Rs.	Rs.
Sales --	8,00,000	64,000	96,000
Costs after separation	80,000	12,800	14,400
Estimated Net Profit Percentage to sales value	--	20%	20%
Estimated selling expenses as percentage of sales value	20%	20%	20%

Reverse cost method should be followed for separation of joint costs.

Solution

Comparative Profit & Loss Statement

	Main Product Rs.	By-product A Rs.	By-product B Rs.
Joint cost upto separation point	3,10,400	*	**
		*	**
Less : Cost allocated to By products	80,000	32,000	48,000
	2,30,400		
Cost after separation	80,000	12,800	14,400
Selling Expenses	1,60,000	6,400	14,400
Total Cost ---	4,70,400	51,200	76,800
Net Profit ---	3,29,600	12,800	19,200
Sales ---	8,00,000	64,000	96,000

Cost allocated to By-products calculated as under

		A		B	Total
		Rs.		Rs.	Rs.
Sales ---		64,000		96,000	
Less : Estimated					
Net profit ---	12,800		19,200		
Estimated selling Expenses	6,400		14,400		
Cost after Separation	12,800	32,000	14,400	48,000	
Cost before Separation		* 32,000		** 48,000	80,000

2.17. JOINT PRODUCTS AND THEIR ACCOUNTING TREATMENT

Meaning

In some industries, two or more products of equal importance are simultaneously produced. These products are

regarded as joint products. As such, "joint products represent two or more products separated in the course of same processing operations usually requiring further processing, each product being in such proportion that no single product can be designated as a major product." Joint products have the following characterstics:

1. They are produced from the same basic raw materials.
2. They are produced simulataneously by a common process.
3. They are comparatively of equal importance.
4. They may require further processing after the point of separation.

For instance, in an oil industry - gasoline, fuel oil, lubricants, coal tar, asphalt and Kerosene are all produced from crude petroleum. All of these are joint products.

Accounting for Joint Product

The joint costs should be properly and reasonably apportioned to various joint products. Otherwise the costs of joint products will vary considerably. Consequently this will affect.

(a) Valuation of closing inventory,

(b) Pricing of products and

(c) Profit or loss on sale of various products.

Even through there are no scientific methods of apportionment of joint costs, the following methods are widely used in apportioning total process costs upto the point of separation.

1. Average Unit Cost Method : This is by far the most simple method. The total costs are assessed, yielding an average unit cost with one net profit for the entire operation. The total process costs upto the point of split-off are divided by the total units or weight produced to arrive at the average cost per unit of production. The process losses are borne by the joint products in the ratio of their output units / weight. This method can be used where the joint products can be measured in terms of common unit viz., Kg., litre, gallon, lb. etc. Where the end products can not be expressed in common unit, this method is not applicable.

Illustration

From the following information, find out the cost of joint products, A, B and C under Average Unit Cost Method.

(a) Pre-separation point costs -- Rs. 40,000

(b) Other production data :

Product	Units produced	Raw materials used (Units)
A	1,000	8,000
B	600	4,000
C	400	8,000
Total	2,000	20,000

Solution

$$\text{Cost per unit} = \frac{40,000}{2,000} = \text{Rs. } 20$$

Cost of Production

Produts	Units produced	Cost per unit	Total
		Rs.	Rs.
A	1,000	20	20,000
B	600	20	12,000
C	400	20	8,000
Total	2,000		40,000

2. Physical Unit Method : A physical base viz., raw materials, is the proportion used to apportion pre-separation point costs to joint products. The physical volume of materials found in joint products at the point of separation is found out and on that basis the cost is apportioned. Process loss is borne by joint products in the ratio of their output-weight. This method can be applied when physical units of output are similar or identical. This method may not be useful where costs hae no relationship to the output-weight of individual products.

Illustration:

An oil processing company produces two main products A and B . During the month of February of a particular year the company produced. A 2,000 gallons and produced B 1,000 gallons. The joint cost upto split-off point was Rs. 1,000. Apportion the joint cost by using relative weight of output method.

Solution

Split-off point cost Rs. 1,000 for 3,000 gallons. Therefore, the product cost on the physical quantity basis comes to Rs. 0.33 per gallon. Cost are assigned as follows:

	Production	Weighting	Cost Assigned
A.	2,000 gallons	$\frac{2,000}{3,000} \times 1,000$	Rs. 660
B.	1,000 gallons	$\frac{1,000}{3,000} \times 1,000$	Rs. 340
			Rs.1,000

3. Survey Method : Under the method, all important factors viz., volume, selling price, marketing process, technical aspects etc. affecting costs are ascertained by means of an extensive survey. Percentages or point values are given to individual products as per their relative importance and cost are aportioned on the basis of total points. These ratios should be revised from time to time depending upon the factors affecting production and sales.

4. Market Value Method : This is very popular method because it makes use of a realistic basis for apportioning joint costs. Products are made to bear a proportion of the joint cost on the basis of their ability to absorb the same. Under this method, joint costs are apportioned after ascertaining "What the traffic can bear". Market value represents the weighted market value i.e., units produced multiplied by the price of a unit of joint product.

2.18 ILLUSTRATION - 7

From the following information, ascertain the profit made by each product, apportioning the joint costs on a sales value basis:

		A	B
		Rs.	Rs.
Sales	---	76,000	84,000
Selling costs	---	10,000	40,000
Materials		Rs. 62,400	
Process costs		Rs. 27,600	

Solution

Joint costs be apportioned:

Rs. 62,400 + Rs.27,600 = Rs. 90,000

	Product A	Product B
	Rs.	Rs.
Sales ---	76,000	84,000
Selling costs ---	10,000	40,000
Effective sales value	66,000	44,000
Joint cost apportionment (ratio 3 : 2)	54,000	36,000
Profit	12,000	8,000

2.19. POINTS TO REMBMER

Process costing is a method of costing applied to industries in which the material has to pass through two or more processes before being converted into a finised product. The different processes are in a sequential order so that the output of the earlier stage becomes the input of succeeding stage, and then the output of the final stage becomes the finished product.

Process costing is applied in manufacturing industries like cement, paper, rubber; chemical industries like oil, chemicals, mining industries viz., mineral oil, coal, iron; and public utility works like water supply, gas supply, generation and distribution of electricity.

In case of some industries, the output of one process is transferred to the next process not at cost but at market value or plus a percentage of profit. The excess of transfer price over cost is known as inter-process profit. The purpose of this practice is to : (i) show whether cost of production competes with market prices, and (ii) make each process stand on its own efficiency and economy.

The methods used for valuing by-products may be categorised as :

(i) Non-cost methods or Sales Value Methods.

(ii) Cost Methods.

The methods used for apportionment of joint costs in case of joint products are :

(i) Average Unit Cost Method

(ii) Physical Unit Method.

(iii) Survey Method

(iv) Market Value Method

Abnormal Loss is ascertained as :

$$\frac{\text{Normal Cost of Normal Output}}{\text{Normal Output (units)}} \times \text{Abnormal loss (units)}$$

Abnormal Gain is calculated as :

$$\frac{\text{Abnormal Cost of Normal Output}}{\text{Normal Output (units)}} \times \text{Abnormal Gain (units)}$$

2.20 KEY WORDS

Normal Process Loss : It is the loss which is unavoidable on account of inherent nature of material or due to other technical reasons.

Abnormal Process Loss : Loss caused by abnormal or unexpected conditions like accident, carelessness, substandard materials etc. or loss in excess of the anticipated normal process loss is regarded as abnormal process Loss.

Abnormal Gain : If the actual process loss or wastage is less than the determined percentage of normal loss or wastage, the difference is called abnormal gain or effectiveness.

Scrap : It is the descarded material which has some recovery value and which is usually either disposed of without further treatment (other than reclamation and handling), or reintroduced into the production process in place of raw material.

By-product : In some industries, the production of the main product is accompanised by production of one or more secondary products. These minor or secondary products are known as "By-products". By - products are products of comparatively small value that are produced incidental to the main product.

Joint product : Joint products represent two or more products separated in the course of same processing operations usually requiring further processing, each product being in such proportion that no single product can be designated as a major product.

2.21. SELF ASSESSMENT QUESTIONS

1. Describe the characteristics of Process Costing. Name eight industries where Process Costing can be applied.
2. Explain the factors which should be considered by a cost accountant in deciding whether to apply a process or job costing system. In what type of industries is process costing generally applied?
3. Narate the points of distinction between job costing and process costing.
4. What do you understand by normal wastage and abnormal wastage of materials during the manufacturing process? Stage how each of these two are treated in cost accounts.
5. How will you deal with the following in cost accounts?
   (a) Normal wastage, (b) Abnormal wastage,
   (c) Abnormal effectiveness.
6. What do you understand by joint products? Discuss, in brief, the methods which may be applied in the costing of joint-products.
7. Distinguish between joint product and by-product with reference to the :
   (a) Method of accounting and
   (b) Method of valuation.

8. What is a by-product? Explain how would you suggest for accounting for by-product?

9. What is inter-process profit? Explain how would you compute the reserve for unrealised profits.

10. Explain the distinctive features of by-product and joint product.

Normal and Abnormal Losses and Abnormal Gains:

11. A product passes through three processes - A, B and C . The normal wastage of each process is as follows:

Process A - 3% B-5% C-8%

Wastage of Process A was sold at Rs. 0.35 per unit, that of B at Re.0.50 per unit and that of C at Re.1 per unit. 10,000 units were introduced to Process A at Re.1 per unit. The other expenses were as follows:

	Process		
	A	**B**	**C**
	Rs.	Rs.	Rs.
Sundry Materials	1,000	1,500	500
Labour	5,000	8,000	6,500
Direct Expenses	1,000	1,100	2,000
Actual output	9,500 units	9,100 units	8,100 units
(in units)			

Prepare Process Accounts, assuming that there were no opening or closing stocks.

Inter-Process Profit :

12. From the following information of a Manufacturing Company which manufactures a product, you are required to prepare Process Accounts.

	Process A	**Process B**	**Process C**
	Rs.	Rs.	Rs.
Material	30,000	7,500	7,500
Direct wages	22,500	15,000	15,000
Closing stock	7,500	8,750	21,300

Finished goods sold for Rs. 1,30,000 value of closing stock of finished goods Rs. 5,612. It is the policy of the company to charge 20% on tranfer price (25% of cost price) while transferring goods from Process-A to B and 20% on cost price from B to C and from C to the finished stock.

Joint Product

13. From the following information, ascertain the profit made by each product, apportioning joint costs on a sales value basis:

	Product	
	A	**B**
	Rs.	Rs.
Sales ---	4,00,000	6,00,000
Selling costs ---	50,000	2,00,000

Joint costs:

Materials	Rs.3,00,000
Process costs	Rs.1,00,000

By-Product:

14. The product A yields by-products B and C. The joint expenses of manufacture are :

Materials Rs. 5,000; Labour Rs.4,000;

Overhead Rs.4,500; the subsequent expenses are as follows:

	A	**B**	**C**
	Rs.	Rs.	Rs.
Materials	1,000	800	900
Labour	1,200	700	850
Overhead	1,300	500	750
	3,500	2,000	2,500
Selling Price	21,000	10,000	9,000
Profit on sales	50%	50%	331/3%

Show how would you apportion the joint expenses of manufacture and prepare the necessary cost accounts.

2.22. FURTHER READINGS

Arora, M.N. "Cost Accounting"
Vikash Publishing House Pvt. Ltd.

Lall Nigam, B.M. "Theory and Techniques of Cost Accounting",
& Himalaya Publishing House, Mumbai
Sharma, G.L.

BLOCK - 2

UNIT - 3 RECONCILIATION OF COST AND FINANCIAL ACCOUNTS

Structure :

3.0 Objectives :

After studying this unit of the block, you should be able to:

- Explain the need for reconciliation of cost and financial accounts.
- State the objectives of reconciliation of cost and financial accounts.
- Trace the reasons for disagreement between cost accounts and financial accounts.
- Exercise the procedure of reconciling between cost accounts and financial accounts.

3.1 INTRODUCTION

In business and industrial enterprises where cost accounting and financial accounting systems are maintained separately, the difference between the profits shown by the two systems is bound to arise. Even if the cost accountant maintains his own ledger on double entry principle, customarily his profit differs from the one shown by the financial accounts.

There are two systems of keeping cost accounts - integral accounting system and non-integral accounting system. In integral accounting system, only one set of accounts is maintained which contains both financial and cost accounts. In this system, obviously there is no need for any reconciliation between cost and financial accounts.

But in non-integral accounting where separate financial accounts and cost accounts are kept, the profit or less shown by the two sets of accounts may be different. In such cases, it is necessary to reconcile cost and financial accounts. In the absence of reconciliation, the two sets of accounts may provide contradictory information on the basis of which management may take wrong decisions.

3.2 OBJECTIVES OF RECONCILIATION

Reconciliation is resorted to fulfil these two objectives :

1. Locate the reasons for the difference in the profit or loss in cost books and financial set of books.
2. Check and verify the reliability of cost as well as financial data and arithmetical accuracy.

3.3. NEED FOR RECONCILIATION

The need for reconciliation arises due to the following reasons :

1. Reconciliation is necessary to find out the reasons for the difference and to ensure than no income or expenditure item has been omitted and that there is no under or over-recovery of overheads.

2. Cost ascertainment and cost control depend on the accuracy of cost analysis, distribution and allocation. If the total expense which is classified and distributed in cost accounts is not correct, cost allocation and ascertainment would be rendered inaccurate and misleading. Therefore, it is necessary that costing figures in total should agree with the financial records to ensure the accuracy of costing data. Reconciliation also enables to test the reliability of cost accounts.

3.4 REASONS FOR DISAGREEMENT BETWEEN COST ACCOUNTS AND FINANCIAL ACCOUNTS

The reasons for disagreement in the profit or loss shown by the two sets of accounts may be attributed to the following categories.

1. Items shown only in financial accounts :

There are a number of items which are shown in financial accounts and not in cost accounts. These items are classified into three categories as under:

(a) Purely financial charges :

(i) Losses on investments.

(ii) Losses on sale of capital assets.

(iii) Discounts on bonds, debentures etc.

(iv) Interest on bank loans and mortgages etc.

(v) Fines and penalties.

(vi) Damages payable under law.

(b) Purely financial incomes :

(i) Rents receivable.

(ii) Dividends and interest received on investments.

(iii) Interest received on bank deposits.

(iv) Transfer fees received.

(v) Profits arising from sale of capital assets.

(c) Appropriation of profit :

(i) Dividing paid.

(ii) Transfer to reserves.

(iii) Charitable donations.

(iv) Income-tax.

(v) Amounts written off goodwill, preliminary expenses etc.

(vi) Any other items which appear in Profit and Loss Appropriation Account.

2. Items shown only in cost accounts : There are certain items which are included in cost accounts but not in financial accounts. These items are :

(i) Charges in lieu of rent where premises are owned.

(ii) Interest on capital employed in production but upon which no interest is actually paid.

3. Under-absorption or over-absorption of overheads

In cost accounts, overheads are recovered at a pre-determined rate whereas in financial accounts these are recorded at actual cost. This may cause a difference between overheads absorbed in cost and actual overhead cost incurred. Such differences should be written off to an Overhead Adjustment Account. As a result, the actual amounts in financial account will agree with those shown in cost accounts.

However, when under or over-absorbed overhead are not written off to an Adjustment Account and carried forward to the next accounting year, the difference in the two sets of accounts will exist. In such a case, it becomes necessary to take into account while reconciling the two accounts.

4. Different bases of stock valuation

In cost accounts stocks are valued according to the system adopted in Stores Account e.g., FIFO, LIFO etc. But valuation of stock in financial accounts is invariably based on the principle of cost or market price whichever is less. This results into some difference in profit or loss shown by the two sets of account books.

5. Different bases of depreciation

The rates and methods of charging depreciation may be different in two sets of accounts. Foe example, in the financial accounts straight line or diminishing balance method may be used, whereas in cost accounts machine-hour rate or replacement value method may be used.

3.5 DIFFERENT TRATMENT OF ACCOUNTS

Some of the items in financial accounts are treated differently from those in cost accounts. Such instances are :

(i) **Abnormal losses and savings :** In financial accounts, the abnormal items are merged with their normal headings. Abnormal losses of material or time, for instance, will be added to the debits for materials and wages. In cost accounts, on the other hand, abnormal wastages, losses or savings are kept outside the manufacturing costs. Losses as a result of obsolescence, overhauling of the plant etc., are not entered in the cost accounts, but are kept separate.

(ii) **Depreciation :** In financial accounts, depreciation is treated as a period cost which varies with the lapse of time. By way of prudence, it is customary these days to charge extra depreciation on some accelerated methods. Cost accounts do not allow for such extra charge. Besides, in cost ledger depreciation is treated as a variable cost.

(iii) **Inventory valuation :** In cost accounts, finished stock and work-in-progress are generally valued at factory cost. But the basis of valuing factory cost could be LIFO, FIFO, base stock, weighted average, standard or replacement cost. But in financial accounts, the conventional principle of cost or market price, whichever is lower, is adopted. Resultantly the difference emerges.

(iv) **Overhead charged :** Various methods have been employed to recover overhead costs. The aim is to make a fair and logical charge in respect of the overheads. But all these methods are based upon estimate and hence, will recover a little more or less

from the total amount of indirect expenses. Hence under or over-absorption of overheads causes difference in two sets of accounts. In addition certain overheads e.g., selling and distribution costs might have been totally ignored in cost accounts.

3.6 EFFECT OF VARIOUS ITEMS ON PROFIT

The effect of various items, already discussed, on the profit reflected by cost accounts and financial accounts is analysed as under.

Reasons for Differences	Effect on Profit as per Cost Accounts		Effect on Profit as per Fin. Accounts	
	More	Less	More	Less
1. Pure financial charges	✓			✓
2. Items shown in Cost A/c only		✓	✓	
3. Incomes and gains credited to financial accounts only		✓	✓	
4. Expenses or Losses included in financial accounts only.	✓			✓
5. Over-recovery of overheads in Cost A/c.		✓	✓	
6. Under-recovery of overheads in Cost A/c.s.	✓			✓
7. Methods of deprecidation :				
Excess depreciation cost books when compared to financial books		✓	✓	
Excess depreciation in financial books.	✓			✓
8. Valuation of stock :				
Higher value of opening stock and / or lower value inclosing stock in cost books.		✓	✓	
Lower value of opening stock and / or higher value of closing stock in cost book	✓			✓

3.7 PROCEDURE OF RECONCILIATION

The cost and financial accounts are reconciled by preparing a Reconciliation Statement or a Memorandum Reconciliation Account. The following procedure is recommended for preparing a Reconciliation Statement :

1. Ascertain the points of difference between cost accounts and financial accounts.

2. Start with the point as per cost accounts.

3. **(a) Regarding items of expenses and losses**

Add : Items overcharged in cost accounts.

Deduct : Items undercharged in cost accounts.

For example, depreciation in cost accounts is Rs. 5,500 and that in financial accounts is Rs. 6,000. This will add to costing profit by Rs. 500. Then in order to reconcile, Rs. 500 will be deducted from costing profit.

(b) Regarding items of incomes and grains

Add : Items under-recorded or not recorded in cost accounts.

Deduct : Items over-recorded in cost accounts.

For example, interest in investments received amounting to Rs. 2,000 is not recorded in cost accounts. This will have the effect of reducing profit as per cost books. Thus in order to reconcile, this amount of Rs. 2,000 for interest should be added to the costing profit.

(c) Regarding valuation of stock

(i) **Opening stock :** Add : Amount of over-valuation in cost accounts.

Deduct :Amount of under-valuation in cost accounts

(ii) **Closing stock :** Add : Amount of under-valuation in cost accounts.

Deduct: Amount of over-valuation in cost accounts.

4. After making all the above additions and deductions in costing profit, the resulting figure shall be the profits as per financial books.

5. The above treatment of items will be reversed when the staring point in the Reconciliation Statement is the profit as per financial accounts or loss as per cost accounts.

3.8 ILLUSTRATION - 1

From the following figures, prepare a Reconciliation Statement :

	Rs.
Net profit as per financial records ……	1,28,755
Net profit as per costing records …….	1,72,400
Works overhead under-recovered in costing …..	3,120
Administrative overhead recovered In excess ……	1,700
Depreciation charged in financial records	11,200
Depreciation recovered in costing ……..	12,500
Interest received but not included in costing	8,000
Obsolescence loss charged in financial Records ……	5,700
Income-tax provided in financial books ……	40,300
Bank interest credited in financial books …..	750
Stores adjustments (credit in financial books).	475
Depreciation of stock charged in financial Books …..	6,750

Solution :

Reconciliation Statement

Particulars	Amount Rs.	Amount Rs.
Net Profit as percosting records		1,72,400
Add : Excess Depreciation charged		
(Rs. 12,500 - 11,200)	1,300	
Excess Administrative Overhead	1,700	
Interest received but not included	8,000	
Bank interest …..	750	
Stores adjustment …	475	
		12,225
		1,84,625
Less : Works overhead under-charged	3,120	
obsolescence loss not charged	5,700	
Income-Tax not provided	40,300	
Depreciation in stock value	6,750	
		55,870
Net Profit as per financial records		1,28,755

Illustration - 2

The following are the figures taken from the cost Ledger of a firm :

(a) Inventory :			**Rs.**
(i)	Opening Balance	……	10,000
(ii)	Net Debits	……	90,000
(iii)	Net Credits	……	80,000
(iv)	Drawals for maintenance		
	Included in net credits above ….		10,000
(b) Work-in-Progress :			**Rs.**
(i)	Opening Balance	……	15,000
(ii)	Debits for material as per		
	Inventory Account	…….	70,000
	Debit for Labour	…….	20,000
	Debits for Overhead ……..		80,000
(iii)	Credits-Finished goods …….		1,75,000
(c)	**Finished products :**		
(i)	Opening Balance	…….	20,000
(ii)	Debits	…….	1,75,000
(iii)	Credits from cost of sales	…….	1,86,000

Further data from financial books :

Sales	…….	……	2,10,000
Wages	……	……	25,000
Other expenses	……	…..	85,000

You are required to prepare a Costing Profit of loss Account leading upto the profit as per financial account. Also reconcile the two profit figures.

Solution :

Costing Profit and loss Account

	Rs.		Rs.
To Materials consumed		By Sales ...	2,10,000
(Rs. 80,000 - 10,000)	70,000		
To Wages	20,000		
Prime Cost	90,000		
To Overhead	80,000		
	1,70,000		
Add : Work-in-Progress			
(Opening Balance)	15,000		
	1,85,000		
Less : WIP -*closing Balance	10,000		
Cost of production	1,75,000		
Add : Finished stocks(opening)	20,000		
	1,95,000		
Less : *Finished stocks-(closing)	9,000		
cost of sales	1,86,000		
Profit ...	24,000		
	2,10,000		2,10,000

* These figures have been found out by preparing these accounts.

Financial Profit and Loss Account

To Opening stock :		Rs.	Rs.		Rs.
Inventory	10,000		By Sales		2,10,000
WIP	15,000		By Closing stock :		
Finished Goods	20,000		Inventory	20,000	
		45,000	WIP	10,000	
To Purchases		90,000	Finished Goods	9,000	
To Wages		25,000			
To Other Expenses		85,000			39,000
To Net Profit		4,000			
		2,49,000			2,49,000

Reconciliation Statement

	Rs.	Rs.
Profit as per Cost Account		24,000
Len : maintenance materials not charged in costing	10,000	
Wages under-charged in costing	5,000	
(Rs. 25,000-20,000)		
Under-absorbed overhead	5,000	
(Rs. 85,000-80,000)		
		20,000
Profit as per financial accounts		4,000

Illustration - 3

The Blue Ltd. Made a profit of Rs. 20,000 during a particular year as per their costing system, whereas their Final Accounts disclose a profit of Rs. 15,000. From the following Profit and Loss Account for the year ended 31st December as per the financial books, you are required to prepare a Reconciliation Statement showing the causes for this difference :

Trading and Profit & Loss Account

	Rs.		**Rs.**
To Opening Stock	1,00,000	By Sales	1,75,000
" Purchases	80,000	By Closing Stock	80,000
" Direct wages	20,000		
" Factory expenses	15,000		
" Gron Profit c/d	40,000		
	2,55,000		2,55,000
To AdministrativeExpenses	10,000	By Gross Profit C/d	40,000
" Selling Expenses	15,000		
" Net Profit	15,000		
	40,000		40,000

Costing records show the following : Rs.

(a) Stock Ledger closing balance …….. 89,000

(b) Direct Labour …… 23,000

(c) Factory Overheads …… 13,000

(d) Administrative overheads and selling expenses expenses calculated at 8% of the selling price.

Solution :

Reconciliation Statement

	Rs.	Rs.
Profit as per Cost Accounts		20,000
Add : Over-recovery of -		
Direct Labour (Rs. 23,000-20,000)	3,000	
Administrative		
Overhead (Rs. 14,000 -10,000)	4,000	7,000
		27,000
Less : Under-recovery of -		
Factory Overhead (Rs. 15,000-13,000)	2,000	
Selling Expenses (Rs. 15,000-14,000)	1,000	
Over-valuation of closing stock		
in cost Accounts (Rs. 89,000-80,000)	9,000	12,000
Profit as per financial accounts		15,000

Illustration - 4

During a certain year, the auditors certified the financial accounts showing a profit of Rs. 1,68,000 ; whereas the same as per costing books was coming out to be Rs. 2,40,000. Given the following information, you are required to prepare a reconciliation statement showing clearly the reasons for the difference.

Trading and Profit & Loss Account

	Rs.		Rs.
To Opening stock	8,20,000	By Sales	34,65,000
" Purchases	24,72,000	By Closing stock	7,50,000
" Direct wages	2,30,000		
" Factory overheads	2,10,000		
" Gron Profit c/d	4,83,000		
	42,15,000		42,15,000
To Administrative Expenses	95,000	By Gross Profit c/d	4,83,000
To Selling Expenses	2,25,000	By Sundry income	5,000
* Net Profit	1,68,000		
	4,88,000		4,88,000

The costing records show :

(a) Book value of closing stock Rs. 7,80,000.
(b) Factory overheads have been absorbed to the extent of Rs. 1,89,800.
(c) Sundry income is not considered.
(d) Administrative expenses are recovered at 3% of selling price.
(e) Total absorption of direct wages Rs. 2,46,000.
(f) Selling prices include 5% for selling expenses.

Solution :

Reconciliation Statement

	Rs.	**Rs.**
Profit as per Cost Accounts		2,40,000
Add : Sundry income not considered in cost books …	5,000	
Add : Administrative expenses over-recovered in cost books ……	8,950	
Add : Over-absorption of direct wages	16,000	29,950
Less : Over-valuation of stock in cost books …….	30,000	2,69,950
Less : Factory overheads under -absorbed overhead in cost books …..	20,200	
Less : Selling overhead under-absorbed in cost book ….	51,750	
		1,01,950
Profi as per Financial Accounts		1,68,000

Illustration - 5

The net profit of the X co. Ltd. Appeared at Rs. 60,652 as per financial records for a particular year ending 31st March of the year. The Cost Books, however, showed a net profit of Rs. 86,200 for the same period. A scrutiny of the figures from both the sets of accounts revealed the following facts :

	Rs.
Works overhead under-recovered in costs …….	1,560
Administrative overhead over-recovered in costs …..	850
Depreciation charged in financial accounts ……..	5,600
Depreciation recovered in costs……	6,250
Interest on investments not included in costs …….	4,000
Loss due to obsolescence charged in financial account …	2,850
Income-Tax provided in financial accounts ……..	20,150
Bank Interest and transfer fee in financial books ……..	375
Stores Adjustment (credit in financial books)	237
Value of opening stock in :	
Cost Accounts	24,800
Financial A/cs.	26,300
Value of closing stock in :	
Cost Accounts …….	25,000
Financial A/cs ……	23,000
Interest charged in accounts ……	2,000
Good will written off ……..	5,000
Loss on sale of furniture …….	600

Prepare a statement showing the reconciliation between the figures of net profit as per Cost Accounts and the figures of net profits as shown in the Financial Books.

Solution :

Reconciliation Statement

			Rs.	Rs.
Profit as per Cost Accounts …….				
Add :	(a) Administrative overheads over-recovered in Cost A/cs. ……		8500	
	(b) Depreciation overcharged in Cost Accounts :			
	Cost Books …….	6,250		
	Financial Books …	5,600	650	
	(c) Receipts and grains credited in Financial Books but not shown in Cost Books :			
	(i) Interest on investment …….		4,000	
	(ii) Bank interest and transfer fees		375	
	(iii) Stores Adjustment …..		237	
	(d) Interest charged in Cost Accounts ….		2,000	8,112
				94,312
Less :	(a) Works overhead under-recovered in cost Books …..		1,560	
	(b) Expenses and losses debited in Financial Books but ignored in cost Books :			
	(i) Income Tax		20,150	
	(ii) Loss due to obsolescence ..		2,850	
	(iii) Goodwill written off ….		5,000	
	(c) Under-valuation of opening stock in Cost Accounts ….		1,500	
	(d) Over-valuation of closing stock in Cost Accounts ….		2,000	
	(e) Loss on sale of furniture ……		600	33,660
	Profit as per Financial Accounts			60,652

3.9 POINTS TO REMEMBER

The objectives of reconciliation are :

(i) to ascertain the reasons for the difference in the profit or loss as per cost books and financial set of books.

(ii) To check and verify the reliability and accuracy o both the cost data and those of the financial set of books.

Some of the items in financial accounts are treated differently from those in cost accounts. As a consequence, difference arises between the profits or loss as per the costing books and the financial set of books. Such items are the following :

(i) Abnormal losses and savings,

(ii) Depreciation.

(iii) Inventory valuation

(iv) Overhead charged.

The procedure of reconciliation of profits & losses as per cost accounts and those of financial accounts involves the following steps :

(i) Regarding items of expenses and losses - add items overcharged and deduct items undercharged.

(ii) Regarding items of incomes and gains - add items under recorded or not recorded and deduct items over recorded.

(iii) Regarding Valuation of opening stock - add amount of over-valuation and deduct amount of under-valuation.

(iv) Regarding valuation of closing stock - add amount of under-valuation and deduct amount of over-valuation.

3.10. KEY WORDS

Over-absorption : Overhead costs are charged to cost units at some pre-determined rates. Hence the amount of overhead costs absorbed in excess of actual overhead costs is called over-absorption of overheads.

Under-absorption : Overhead costs charged to cost units (at predetermined rates) less than the actual overhead costs are known as under-absorption of overhead.

Reconciliation : Reconciling the differences between costing set of books and financial set of books of accounts.

3.11. SELF-ASSESSMENT QUESTIONS

1. What are the reasons for difference in the profits revealed by financial and cost accounts? How would you reconcile the two profits?

2. How would you account for difference in the results shown by financial books and costing records?

3. Name and six items which are included in financial accounts but they are not included in cost accounts and state the effect on the profits of cost accounts.

4. Why is reconciliation of cost and financial accounts necessary? Under what circumstances, a reconciliation statement can be avoided?

5. "It has been stated that an efficient costing system will not necessarily produce accounts which in their result will agree with the financial accounts." Comment on this statement.

6. What purposes are served by the preparation of Reconciliation Statement? Explain each of them in detail.

7. Indicate with reasons how you would consider the following while reconciling the financial profits with the profits as shown by the cost accounts:

   (a) Under-absorption of factory overhead.

   (b) Over-valuation of closing stock in cost accounts.

   (c) Income-tax provided in financial accounts

8. Describe briefly the procedure for preparing a statement reconciling the profits as per cost accounts and as per financial accounts.

9. A firm whose financial year ends on 31st March shows that according to financial books profit amounts to Rs. 2,57,500. Profits as per Cost Accounts are Rs.3,44,800. While reconciling the two profits, following differences have been noticed.

	Rs.
Under-absorption of Factory Overhead	6,240
Over-absorption of office Overheads	3,400
Depreciation charge in Financial Accounts	22,400
Depreciation charge in Cost Accounts	25,000
Interest on investment not included in Cost Accounts --	16,000
Loss included in Financial Account	11,400
Income-Tax ---	8,600
Interest and dividenol received ---	2,450
Loss due to depreciation in stock value in Financial set of books--	13,500

You are required to reconcile the two profits and prepare Reconciliation Statement.

10. From the following figures prepare a Reconciliation Statement:

	Rs.
Net Loss as per financial records ---	2,08,045
Net Loss as per costing records ---	1,72,400
Works overhead under-recovered in costing –	3,120
Administrative overhead recovered in excess ---	1,700
Depreciation charged in Financial records	11,200
Depreciation recovered in costing ---	12,500
Interest received not included in costing ---	8,000
Obsolescence loss charged in financial records	5,700
Income-tax provided in financial books ---	40,300
Bank interest credited in financial books ---	750
Stores adjustments (credit-in financial books) ---	475
Value of opening stock in : Cost accounts ---	52,600
Financial accounts --- --- ---	4,000
Value of closing stock in : Cost accounts ---	52,000
Financial A/cs – --- ---	49,600
Interest charged in cost accounts but not in financial accounts ---	6,000
Preliminary expenses written off in financial accounts ---	800
Provision for doubtful debts in financial accounts –	150

3.12 FURTHER READINGS

Arora, M.N., "Cost Accounting", Vikas Publishing House Pvt. Ltd, New Delhi.

Rao, V.S.P., "Cost Accounting", Vrinda Publications (P) Ltd., Delhi - 91.

BLOCK - 3

ANALYSIS AND INTERPRETATIN OF ACCOUNTS

ANALYSIS AND INTERPRETATIN OF ACCOUNTS - STUDY OF FINANCIAL STATEMENTS ; VERTICAL FORMS-RELATIONSHIP BETWEEN ITEMS IN BALANCE SHEET AND PROFIT & LOSS ACCOUNT; TREND ANALYSIS; COMPARATIVE STATEMENTS; COMMON SIZE STATEMENTS

Block - 3 consists of two units.

Unit - 1 Discusses the meaning and objectives of financial statement analysis.

Unit -2 Explains the techniques of financial statement analysis. It discusses the techniques like horizontal analysis, vertical analysis, trend analysis and ratio analysis.

UNIT - I ANALYSIS AND INTERPRETATION OF ACCOUNTS

Structure

1.0 Objectives

After going through this unit, you should be able to :

- Define the meaning of financial statement analysis.
- Explain the objectives of financial statement analysis.
- Narrate the parties interested in financial statements.
- State the procedure for interpretation.

1.1 MEANING OF FINANCIAL STATEMENT ANALYSIS

The financial statements prepared in an absolute manner are not more than a group of accounting figures and convey nothing to a layman. Of late, corporate managers are becoming increasingly interested in the information presented to them by accounts and are beginning to question the need for and use of such statements prepared by the finance and accounts division. But it is a challenge to those who are presenting, and also to those who are being presented with such information. Therefore, it becomes necessary on the part of the Finance Manager to regroup, analyse and present the financial figures in a more meaningful manner for the use of all non-financial executives.

Financial Statement Analysis is an analysis which highlights important relationships in the financial statements. It emphasizes on evaluation of past operations as revealed by the analysis of basic statements. Financial Statement Analysis includes the methods used in assessing and interpreting the results of past performance and present financial position as these relate to specific factors of interest in investment decisions. It is an important way of assessing past performance and in planning and forecasting future performance. According to Baruch Lev:

> "Financial Statement Analysis is an information processing system designed to provide data for decision making models, such as the portfolio selection model, bank lending decision models, and corporate financial management models."

1.2 OBJECTIVES OF FINANCIAL STATEMENT ANALYSIS

The main objectives of financial statement analysis is to provide information about a business enterprise to decision makers. The decision makers are interested in evaluating the economic situation of the firm and predicting its future course.

Financial statement analysis can be utilized by the different users and decision makers to achieve the following objectives:

1. **Evaluation of Past Performance and Current Position:** Past performance is an indicator of future performance. Therefore, for an investor or creditor, it is necessary to know the trend of past sales, expenses, net income, cash flow and return on investment. By studying these trends, one can judge management's past performance and can also use these as possible indicator of future performance. The analysis of current position also indicates about current state of the business. This will show the types of assets owned by a business and also the liabilities due against the business concern. This will also reflect the cash position, relation of debt to equity and the levels of inventories and receivables.

2. **Prediction of Net Income and Prospects of Growth:** The financial statement analysis is useful in predicting the earning prospects and growth in the earnings which are used by investors for comparison of investment alternatives. Financial statements which contain information on past performances are analysed and interpreted as a basic for forecasting future rates of return and risks. Such prediction tends to improve the financial decisions of the investors.

3. **Prediction of Bankruptcy and Failure:** Financial statement analysis is an important tool in predicting the bankruptcy and probability of failure of business enterprises. Financial statement analysis performs this through the assessment of solvency position. After getting such prediction, managers and investors both can take preventive steps to avoid or minimize losses.

4. **Loan decision by Financial Institutions and Banks:** All lenders are primarily concerned with repayment of loan and payment of interest on the due dates. This requires comprehensive investigation and analysis of the financial statements submitted by the borrowers. Financial statement

analysis is useful in determining credit risk, deciding terms and conditions of loan, interest rate, date of maturity etc.

1.3 INTERPRETATION OF FINANCIAL STATEMENTS

The first step in the interpretation of financial statements is analysis. Analysis has no value without interpretation and interpretation is not at all possible without analysis. Different account balances appear in the financial statements. These account balances do not reflect homogeneous data, hence it is not easy to interpret them and draw some conclusions. Therefore interpretation requires an analysis of data in the financial statements so as to bring some homogeneity in the amounts shown in the financial statements. Analysis means splitting of the total amount contained in the statements into their component parts. It is largely a study of relationship among the various financial factors in a business.

The second step in the interpretation of financial statements is comparison. Just an examination of the components of a statement can not lead to a definite conclusion in relation to the financial status of a business. In order to interpret the position of an enterprise, it is necessary not only to separate the total given in the financial statements into their components but also to make comparison of the various components and to examine their content. Thus, interpretation requires analysis and comparison.

1.4 PARTIES INTERESTED IN FINANCIAL STATEMENTS

Different parties are interested in the study of published financial statements of companies and their outlook often differs very widely.

The main interested parties and their purposes of interpretation are as follows:

(i) Management: To review the progress, position and prospects of the company and to decide upon the course of action to be taken in future.

(ii) Shareholders: To judge the prospects of their investments and to elect to sell or continue ownership.

(iii) Debentureholders: To know the adequacy of the provisions for replacement of fixed assets, ensuring security of their investment to satisfy their claims.

(iv) Creditors and Bankers : To ascertain whether there will be adequate surplus of liquid assets to satisfy their claims against the company.

(v) Trade Union/ Employees: To decide the ability of the company to pay higher wages, bonus etc.

(vi) Security analysis: To learn and advise their clients whether it is time to buy, to hold or to sell the securities of the company.

(vii) Auditors : Internal Auditor to report to the management and external auditor to report to the shareholders.

(viii) Government: To protect the interests of the shareholders and public revenue to the treasury.

(ix) Stock Exchange: To protect the investors' interests in listed companies or to act as a "Watchdog" of corporate investors.

(x) Researchers: Economists; the Company Law Board; Public Accounts Committee and the Estimates Committee in respect of Government Companies for wide and varied reasons.

1.5 LIMITATIONS OF FINANCIAL STATEMENT ANALYSIS

Any person using the techniques of analysis of financial statement should keep in kind the very limitations of financial statements themselves. The basic nature of financial statements is historic and essentially they are interim reports. The figures taken from one year statements have limited utility. Any charge in the method or procedure of accounting hampers the utility of such analysis. An analyst should also be cautious from window-dressing in the accounts. Many items are influenced by personal judgment. The soundness of the judgment necessarily depends on the competence and integrity of those who make them.

1.6 PROCEDURE FOR INTERPRETATION

When a Finance Manager is called upon to interpret the financial statements of such companies, he should take the following steps :

(i) Ascertain the purpose and the extent of the analysis and interpretation ;

(ii) Study all available data contained in the financial statements to gain an insight into the meaning and significance of the financial figures ;

(iii) Obtain such additional information as is considered necessary for the work ;

(iv) Tabulate the data in a logical manner ;

(v) Analyse the data by preparation of comparative statements, ratio analysis, trend analysis etc.

(vi) Interpret the facts revealed by the analysis ;

(vii) Present the findings in the form of a report, supplemented by charts, diagrams etc. where necessary.

1.7 POINTS TO REMEMBER

Financial Statement Analysis is an analysis which highlights important relationships in the financial statements. It emphasizes on evaluation of past operations as revealed by the analysis of basic statements. Analysis includes assessing the results of past performance and present financial position as these relate to specific factors of interest in investment decisions.

The main objectives of financial statement analysis are -

(i) Evaluation of Past Performance and current position.

(ii) Prediction of net income and prospects of growth.

(iii) Prediction of bankruptcy and failure.

(iv) Loan decisions by banks and financial institutions.

The first step in the interpretation of financial statements is analysis which involves splitting of the total amount contained in the statements into their component parts. It is largely a study of relationship among the various financial factors in a business.

The second step in the interpretation of financial statements is comparison of the various components and to examine their contents.

1.8 KEY WORDS

Financial statement analysis :

This is an information processing system designed to provide data for decision0making models, such as the portfolio selection model, bank lending decision model and corporate financial management models.

Interpretation :

Interpretation of financial statements means splitting the data according to their components in order to ascertain the significance of relationship between the related data or groups of data ; comparison of past and present performance and subsequently make future prediction relating to the business enterprise.

1.9 SELF ASSESSMENT QUESTIONS

1. Explain the meaning of financial statement analysis. State the main objectives of such analysis.
2. What do you understand by interpretation of financial statements ? What are the components of interpretation ?
3. Discuss about the different parties and their outlook for which they are interested in financial statements.
4. Narrate the procedure of interpretation of financial statements.
5. Describe the limitations of financial statement analysis.

1.9 FURTHER READING

Banerjee, B., "Financial Policy and Management Accounting"

The World Press Private Ltd., Kolkata.

BLOCK - 3

UNIT - 2 STUDY OF FINANCIAL STATEMENTS, VERTICAL FORMS-RELATIONSHIP BETWEEN ITEMS IN BALANCE SHEET AND PROFIT & LOSS ACCOUNT; TREND ANALYSIS ; COMPARATIVE STATEMENTS' COMMON-SIZE STATEMENTS

Structure

2.0 Objectives

After going through this unit, you should be able to :

- Explain the different techniques of analysis of financial statement.
- Utilise the Horizontal Analysis and Vertical Analysis.
- Prepare and explain the Comparative Statements as well as the Common-Size Statements.
- Make Trend Analysis.

2.1 TECHNIQUES OF FINANCIAL STATEMENT ANALYSIS

Different techniques are used in the analysis of financial statements to emphasize the comparative and relative significance of data presented and to assess the position of the firm. These techniques of financial analysis are aimed at showing the relationships and changes. Among the widely used of these techniques are the following :

1. Horizontal Analysis
2. Vertical Analysis
3. Trend Analysis
4. Ratio Analysis

1. Horizontal Analysis

The analysis of percentage increase and decrease in corresponding item in comparative financial statement is called horizontal analysis. Such analysis involves the computation of amount changes and percentage changes from the previous to the current year. The amount of each item in the latest statement is compared with the corresponding item in one more earlier statement. The increase or decrease in the amount of the item is then listed together with the percent of increase or decrease. When the comparison is made between two statements, the earlier statement is used as the base. In case, horizontal analysis includes more than two statements, there are two or even more alternative in the selection of the base. Firstly, the earliest period may be used as the basis for comparing all later periods ; or secondly, each statement may be compared with the immediately preceding statement.

Illustration - 1

Comparative Balance Sheet with Horizontal Analysis

XYZ Co. Ltd.

Balance Sheet

As at 31.12.2004 and 31.12.2005

Particulars	(in lakhs) 2004 Rs.	2005 Rs.	Incease / Decrease Amount Rs.	Percentage
Assets				
Current Assect :				
Cash . . .	100	180	80	80
Marketable Securities	600	660	60	10
Receivables . . .	2,500	2,750	250	10
Inventories . . .	2,000	2,200	200	10
Prepaid Expenses . .	50	100	50	100
Total Current Assets	5,250	5,890	640	12
Properties :				
Land, Buildings,				
Machinery and				
Equipment less				
Accumulated				
Depreciation	5,000	6,000	1,000	20
Other Non-current Assets	200	250	50	25
	10,450	12,140	1,690	16

Particulars	(in lakhs)		Increase/ Decrease	
	2004	2005	Amount	PC
	Rs.	Rs.	Rs.	
Litabilities				
Current Liabilities :				
Payables	2,200	2,300	100	4.5
Taxes payable	300	400	100	33
Dividends payable	100	100	-	-
Total Current Liabilities	2,600	2,800	200	7.6
Long-term Liabilities :				
Long-term Debentures	2,750	2,750	-	-
Other long-term liabilities	600	140	(-) 460	76
Deferred income tax liabilities	400	450	50	13
Total Liabilities	6,350	6,140	(-) 210	3
Ownership :				
Equity Capital	2,500	4,000	1,500	60
Preference Capital	1,600	2,000	400	25
Total ownership	4,100	6,000	1,900	46
Total Liabilities and Ownership	10,450	12,140	1,690	16

The comparative Balance Sheet presents the amount of increase or decrease and percentage changes. The percentage change is calculated as follows :

$$\text{Percentage charge} = \frac{\text{Amount of Change}}{\text{Previous year amount}} \times 100$$

Illustration - 2

XYZ Co. Ltd

Comparative Income Statement with Horizonal Analysis For the years ended 31.12.04 and 31.12.05

Particulars	(Rs. In lakhs) 2004	2005	Increase/Decrease Amount	P.C.
Sales	10,000	10,800	800	8.0
Cost and Expenses :				
Cost of goods sold	6,800	7,100	300	4.4
Selling and Administration Expenses	2,100	2,200	100	4.7
Total Costs and Expenses	8,900	9,300	400	4.5
Earnings from Operations	1,100	1,500	400	36.3
Unusual Charges	-	(500)	(500)	NA
Other income and expenses Including interest Expenses of Rs. 180 and Rs. 110	80	(30)	(110)	(137.5)
Earning Before Income Tax	1,180	970	(210)	(17.8)
Provision for Income Taxes	450	390	(60)	(13.3)
Net Earnings	730	580	(150)	(20.5)

Appropriate care should be exercised while analyzing percentage change. For example, while analysing the changes in the components of total assets in the Comparative Balance Sheet, one may notice 10% increase in both receivables and inventories while the corresponding increase in cash is not adequate.

In the Income Statement, there is 8% growth in sales compared to 137.5% decrease in other income and consequently net earnings in 2005 decreased by 20.5%. This aspect needs immediate attention.

2. Vertical Analysis

Vertical Analysis applies percentages to indicate the relationship of the different parts to the total in a single statement. Vertical analysis sets a total figure in the statement equal to 100 percent and computes the percentage of each component of that

figure. The figure to be used as 100 percent will obviously be total assets or equity capital and total liabilities in the case of Balance Sheet whereas revenue or sales in the case of the profit and loss account.

The following is an example of vertical analysis using Profit and Loss Account and showing each item as a percentage of the sales figure.

Illustration - 3

XYZ Co. Ltd.
Income Statement with Vertical Analysis for the year ended 31.12.2005 (in Thousands of Rs.)

	Amount	Percent
Net sales . . .	5,00,000	100%
Cost of goods sold . . .	3,00,000	60%
Gross Profit . . .	2,00,000	40%
Operating Expenses :		
Administrative Expenses . . .	45,000	9%
Selling Expenses . . .	40,000	8%
Total Operating Expenses . . .	85,000	17%
Operating Income . . .	40,000	8%
Interest Expenses . . .	4,000	0.8%
Income before Income Tax . . .	36,000	7.2%
Income Tax . . .	15,000	3.0%
Net Income . . .	21,000	4.2%

3. Trend Analysis

Trend Analysis or Trend Percentage also plays a significant role in the interpretation of horizontal financial statements. An analysis of the trend of certain business facts is extremely helpful in budgeting, forecasting etc.

In trend analysis, percentage changes are calculated for several successive years instead of between two years. Trend analysis is important because of its long-run view. It may indicate changes in the nature of the business. By looking at a trend in a particular ratio, one may observe whether that ratio is rising, falling or remaining relatively constant. From this observation, a problem is detected or the symptom of a good management is found.

Trend analysis applies an index number over a period of time. For the use of index numbers, the base year is equal to 100 percent. All the other years are measured in relation to that amount. For instance, one may be interested in the trends of sales and earnings for the past five years. For this purpose, data of sales and earnings data of a company are supplied to prepare further the trend analysis or percentages.

Illustration - 4

XYZ Co. Ltd.

Annual Performance (In lakhs of Rupees)

	Year I	Year 2	Year 3	Year 4	Year 5
Sales . . .	220	280	350	450	600
Net Earnings	10	15	25	40	50

The above data reveal a fairly healthy growth pattern. But the pattern of change from year to year can be ascertained more precisely by calculating trend percentages. To achieve this, a base year is selected and thereafter the data are divided for each of the other years by the base year data. The resultant figures are the indexes of the changes that have been occuring throughout the entire period. If the year 1 is chosen as the base year, all data for the year 2 through 5 will be related to the year 1, which is represented as 100%.

To devise the following table, each year sales is divided from year 2 through years 5 by Rs. 220, the year 1 sales in lakhs of Rupees. Likewise the net earning for year 2 through 5 were divided by Rs. 10, the year 1 net earnings in lakhs of Rupees.

Illustration - 5

Annual Performance (Percentage of Base Year)

	Years 1	Year 2	Year 3	Year 4	Year 5
Sales . . .	100	127	159	204	272
Net Earnings	100	150	250	400	500

The trend percentages reveal that the growth in net earnings exceeded the growth in sales in all the years from year 2 upto the year - 5. The growth ratio of net earnings in years 3, 4 and 5 were remarkably high being 2.5 times, 4 times and 5 times respectively as compared to the base year.

Illustration - 6

Modern Textile Co. Ltd.
Comparative Balance Sheet : Trend Percentages

(2001 to 2005) (Rs. 000)

Assets						Base data 2001 = 100% Trend Percentage			
	2001	2002	2003	2004	2005	2002	2003	2004	2005
1. Fixed Assets	154	182	221	270	309	117	143	175	200
2. Current Assets	524	482	591	631	689	92	113	120	131
3. Investments	12	13	15	48	53	108	125	400	441
Total Assets	690	677	827	949	1,051	98	119	137	152
Liabilities and Owners Equity :									
1. Share capital	100	100	135	135	170	100	135	135	170
2. Reserves	73	78	125	125	96	107	170	170	131
3. Long term liabilities	304	316	332	425	478	104	109	140	157
4. Current liabilities	213	183	235	264	307	86	110	124	144
Total liabilities,	690	677	827	949	1,051	98	119	137	152

Taking 2001 as the base year, the total assets and particularly current assets have been reduced during 2002. There is a steady rise in all the assets for all the subsequent years. If these changes were shown in absolute rupees, they would not have expressed themselves as clearly as the percentages do. Moreover, the changes are expressed in relation to the base year so that a clear picture of increase or decrease emerges.

On going through the data relating to resources, it is noticed that twice during this period fresh capital is introduced. It appears that during 2005 part of the increased capital might have been financed out of reserves by issue of bonus shares.

There is a steady rise in long-term as well as current liabilities. This indicates the growing business.

Trend percentages are calculated only for some important items which can be logically connected with each other. While setting out trends of revenues, the trend of costs and expenses should be connected with them. The changes in these items and percentage changes would indicate the factors affecting the profits favorably or unfavorably. Similarly, trend percentages may be calculated to show how much of the total investment is blocked in fixed assets, and in the currents and whether changes in the pattern is suitable.

4. Ratio Analysis

Ratios are simply a means of highlighting in arithmetical terms the relationship between figures drawn from various financial statements. Robert Anthony defines a ratio as simply one number expressed in terms of another. A good number of ratios can be computed from the basic financial statements viz. Profit and Loss Account and Balance Sheet.

In other words, the relationship of one item to another expressed in a simple mathematical form is known as ratio. This relationship may be expressed in different modes of expressing ratios :

(i) Percentages, for instance, cost of goods sold is 65% of the net sales, or

(ii) As a quotient, for instance, current assets are 1.6 times the current liabilities.

The relationship or ratio between current assets and current liabilities is determined by dividing the amount of current assets by

current liabilities. Suppose, current assets are Rs. 1,00,000 and current liabilities Rs. 50,000 ; then Rs. 1,00,000 should be divided by Rs. 50,000 to establish the relationship between the two.

$$\frac{\text{Current assets}}{\text{Current liabilities}} = \frac{\text{Rs. 1,00,000}}{\text{Rs. 50,000}} = 2$$

This relationship or ratio is expressed as under :

(i) Current assets are twice the current liabilities.

(ii) There are Rs. 2 of current assets to meet liabilities of every Re.1.

(iii) That the current assets are 200% of the current liabilities.

(iv) That the ratio of current assets to current liabilities is 2:1.

In whatever way the ratios are expressed they convey deep meaning to the financial data and facilitate its interpretation. Ratio analysis involves three steps. First, the financial manager selects from the statements those sets of data which are relevant to his objective of analysis and calculates appropriate ratios for the firm. The second step calls for a comparison either with the industry standards or with the ratios of the same firm relating to past. After such comparison, the conclusions may be drawn and presented in the shape of report.

Ratio analysis may be made for an internal purpose i.e. for the purpose of management. For this, varied and detailed data would be available within the organization. However, the analysis made by outsiders are generally based upon published statements. The ratios discussed here are mainly on the basis that such analysis is undertaken for the purpose required by the management.

Ratios are guides that are useful in assessing the financial position and operations of a company and in comparing them to previous years or to other companies. The main purpose of ratios is to point out areas for further investigation. They should be utilized in connection with a general understanding of the company and its environment.

Financial ratios are classified in various groups. Indeed their actual classification depends upon the objects of analysis, nature of party interested in calculation and on the quality of the data available. Generally, ratios are divided into two main groups :

Ratios

Statement classification	Purpose or Functional Classification
-Balance Sheet Ratios	-Liquidity Ratios
-Profit & Loss A/c or Revenue Ratios	-Debt Ratios
-Composite or Mixed Ratios	-Profitability Ratios
	-Activity Ratios

2.2 COMPARATIVE FINANCIAL STATEMENTS

Comparative financial statements are the statements of the financial position of a business so designed as to provide time perspective to the consideration of various components of financial position contained in such statements. In any comparative statement columns for more than one year's position or working can be drawn and figures may be provided. The annual data can be compared with similar data for previous years. Comparative statements may be made to show (i) absolute data (in Rupees) ; (ii) increase or decrease in Rupee values, (iii) increase or decrease in absolute data in terms of percentages or (iv) Common-size statements. The important comparative statements are :

(i) Comparative Balance Sheet, (ii) Comparative Income Statement, (iii) Comparative Statement of Working Capital and (iv) Comparative Statement of Manufacturing Costs.

Illustration - 7

VICCO Ltd.

Balance Sheet (Rs. In lakhs)

Liabilities	2004	2005	Assets	2004	2005
Share Capital	70	70	Fixed Assets	100	120
Reserves	70	120	Current Assets :		
Secured Loans	25	20	Stocks	60	80
Unsecured Loans	15	10	Debtors	30	40
Current Liabilities	20	30	Cash	10	10
	200	250		200	250

Solution :

Comparative Balance Sheets

Particulars	(Rs. In lakhs)		Increase/Decrease		
	2004	2005	Amount	P.C.	Ratio
Capital & Liabilities					
Share Capital	70	70	-	-	1.00
Reserves	70	120	+50	+71	1.71
Secured Loans	25	20	-5	-20	0.80
Unsecured Loans	15	10	-5	-33	0.67
Current Liabilities	20	30	+10	+50	1.50
Total Liabilities & Capital	200	250	+50	+25	1.25
Assets					
Fixed Assets	100	120	+20	+20	1.20
Current Assets					
Stock	60	80	+20	+33	1.33
Debtors	30	40	+10	+33	1.33
Cash	10	10	-	-	1.00
Total Assets	200	250	+50	+25	1.25

Recognising the importance of comparative figures for two years, the Companies Act, 1956 has made it mandatory that in the Balance Sheet of a company the figures for the previous year should also be given to facilitate the comparison. However, for the purpose of interpretation of financial statements the figures of only one previous year may not be adequate.

2.3 COMMON-SIZE STATEMENT

Financial statements expressed in absolute rupee figures are not easily comprehensible. It is therefore, necessary that the absolute figures reported in these statements should be converted

into percentages to some common base. Such a statement gives only vertical percentages or ratios for financial data without giving rupee values is known as 'Common-Size Statement.' The common-size statements are also known as "Component Percentage" "Or 100% Statements". This is mainly because each statement is reduced to 100 and each individual item is stated as percentage of the total 100.

Total assets, liabilities and total net sales are stated as 100%. The ratio of each statement item to the statement total is found by dividing individual rupee amounts by total amount in the statement.

Illustration - 8

Using the same data, as given in the Illustration 7, the Common-Size Balance Sheets can be prepared as shown below :

VICC Ltd.

Common-Size Balance Sheets (Percentages)

Liabilities	2004	2005	Assets	2004	2005
Share Capital	35	28	Fixed Assets	50	48
Reserves	35	48	Current Assets :		
Secured Loans	12.5	8	Stocks	30	32
Unsecured Loans	7.5	4	Debtors	15	16
Current Liabilities	10	12	Cash	5	4
	100	100		100	100

Similarly, Common-Size Income Statement can be prepared by assuming total net sales to be equal to 100 and all other figures are expressed as a percentage of sales.

Illustration - 9

It shows operating profit or loss relating to a Transport Corporation and which has been prepared in a Common-size statement.

This data may be analysed to find the percentage of operating costs and gross margin to revenue.

Common-size Statement showing Percentage operating Expenses and Gross Revenue to Total Revenue Earned

Items	2003	2004	2005
Revenue Earned . . .	100%	100%	100%
Total Operating Expenses . .	111%	97%	93%
Gross Revenue -	11%	+3%	+7%

Illustration - 10

However, when it is desired to study the percentage of each item of operating expenses to the total expenditure, in relation to the data presented in Illustration - 9, the Common-Size Statement may be prepared as under:

. . . . . Sate Transport Corporation

Statement showing Percentage of Operating Costs to Total Operating Cost

	2003	**2004**	**2005**
Items	**100%**	**100%**	**100%**
Running Costs . . .	50%	55%	49%
Fuel . . .	25%	30%	34%
Maintenance . . .	25%	15%	17%
	100	100	100

2.4 POINTS TO REMEMBER

Financial statement analysis in an information processing system aimed at providing data for decision making. It is also an important way of assessing past performance and in planning and forecasting future performance.

Different techniques are used in the analysis of financial statements to emphasize the comparative and relative significance of data presented and to assess the position of the firm.

Among the widely used of the techniques of financial analysis are comparative balance sheet, comparative income statement, trend analysis, common-size statement and ratio

analysis. Comparative financial statements are the statements of the financial position of a business so designed as to provide time perspective to the consideration of various components of financial position contained in such statements.

2.5 KEY WORDS :

Horizontal Analysis : The analysis of percentage increase and decrease in corresponding item in comparative financial statement is called horizontal analysis. It involves the computation of amount changes and percentage changes from the previous to the current year.

Vertical Analysis : Vertical analysis applies percentages to indicate the relationship of the different parts to the total in a single statement. Such analysis sets a total figure in the statement equal to 100% and computes the percentage of each component of that figure.

Common-size statement : Comparative statements that give only the vertical percentages or ratios for financial data without giving absolute rupee values, are known as Common-Size Statements'.

2.6 SELF ASSESSMENT QUESTIONS :

1. What do you mean by financial statement analysis ? What are its purposes ?
2. State the limitations of financial statements and show how analysis of these statements increases their utility.
3. Explain the different techniques of analysis and interpretation of financial statements.
4. "The conventional financial statements themselves are static but the life and speech is provided by their analysis and interpretation." Comment on this tatement.

5. What is horizontal analysis ? Discuss about the utility of such analysis. Explain giving suitable examples.

6. What is vertical analysis ? Narrate its utility and give suitable examples.

7. What do you understand by vertical and horizontal analysis? Distinguish between the two.

8. The position of inventory stock at the end of different accounting years was as follows :

Year	2000	2001	2002	2003	2004
Inventory (Rs.)	25,000	30,000	22,000	21,000	23,000

Prepare a statement showing the trend percentages.

9. The following are the Balance Sheets of the Primer Co. Ltd. for the years 2004 and 2005.

BALANCE SHEETS (Rs. In lakh)

Liabilities	2004	2005	Assets	2004	2005
Share Capital	150	150	Fixed Assets	250	300
Reserves	190	240	Current Assets :		
Secured Loans	30	40	Stocks	90	100
Unsecured Loans	20	30	Debtors	50	60
Current Liabilities	20	25	Cash	20	25
	410	485		410	485

Prepare Comparative Balance Sheets of the Company.

10. Using the same data, as given in the question no. 9, prepare Common-Size Balance Sheets of the Company for the years 2004 and 2005.

2.7 FURTHER READINGS :

Lal, Jawahar, "Mangerial Accounting", Himalaya Publishing House, Mumbai.

BLOCK 4

ACCOUNTING RATIOS

ANALYSIS AND INTERPRETATION OF FINANCIAL DATA-DIFFERENT MODES OF EXPRESSING RATIOS; ANALYSIS AND INTERPRETATION OF DIFFERENT RATIOS ACCORDING TO CONVENTIONAL AND FUNCTIONAL CLASSIFICATIONS

Block - 4 comprises two units.

Unit - 1 : Discusses the meaning, purpose and need for analysis of ratios. This unit also explains the advantages and limitations of ratio analysis.

Unit - 2 : Explains the different modes of expressing ratios. This unit discusses the classifications of ratios.

UNIT - 1 : ANALYSIS AND INTERPRETATION OF FINANCIAL DATA

Structure

1.0 OBJECTIVES

After going through this unit, you should be able to :

- Explain the meaning of ratio analysis, purpose of ratio analysis, need for analysis of ratio and use of ratios.
- Narrate the advantages and limitations of ratio analysis.

1.1 MEANING, PURPOSES AND NEED FOR RATIO ANALYSIS

Ratio analysis is an important means of expressing the relationship between two numbers. A ratio can be ascertained from any pair of figures. A ratio must represent a meaningful relationship to achieve its objectives, but the use of ratios can not substitute studying the underlying data.

It is not easy to arrive at any concrete conclusion from a large number of figures with varying degrees, whether a business is progressing or not. The following situation will make this point clear.

Situation	Capital Employed	Profit Earned
	Rs.	Rs.
No.1	60,000	12,000
No.2	48,000	12,000
No.3	50,000	10,000

From the situations mentioned here, it is very difficult to recommend any situation as being the best of the three situations. Persons without knowledge of accountancy and arithmetics may perhaps recommend situation No.1 which indicates highest profit. They may also be in a dialemma which one of these situations is by far the best. To overcome such problem the only solution is to bring a relationship between the two figures appearing therein and express them in terms of percentage.

Situation	Relationship	Result (Percentage)
No.1	$\frac{12,000}{60,000} \times 100$	20%
No.2	$\frac{12,000}{48,000} \times 100$	25%
No.3	$\frac{10,000}{50,000} \times 100$	20%

From the situations shown above, it is quite clear that the situation no.2 is by far the best of all the situations. Therefore, ratio analysis is the process of determining and interpreting numerical relationships based on financial statements. Presentation of these ratios enables the user to understand financial statements in a better way than by simply looking at the absolute rupee amounts alone.

Ratios are guides or indicators that are useful in evaluating the financial position and operations of a company and in comparing them to previous years or to other companies. The main purpose of ratios is to pinpoint the areas for further investigation. They should be used in connection with a general understanding of the business enterprise and it environment.

The outsiders are also benefited by the study of accounting rations. They are mainly interested in:

(i) The solvency or liquidity position (short-term and / or long-term).

(ii) The profitability or the earning capacity.

For example, a temporary lender of money will be interested in the liquidity position of the firm and analysis of solvency position will help him to determine the desirability of granting loan. Likewise, a mortgage will be interested mainly in his security, an intending investor, in the earning capacity and so on.

1.2 ADVANTAGES OF RATIO ANALYSIS

Ratio analysis is useful to management in pointing out specific areas that reflect improvement or deterioration as well as detect any point of trouble area that may hamper the attainment of objectives. The related parties carry out frequent examination of these three areas to evaluate management's ability to maintain a satisfactory balance among them, and to appraise the efficiency and effectiveness with which management directs the firm's operations. In this way, the purpose of ratio analysis is to help the reader of financial statements understand the information shown by focusing a number of key relationships. However the following are the principal advantages of ratio analysis:

1. Accounting ratios are most commonly used for management control purpose, by comparing its own performance with the performance with the performances of other similar types of business. It permits the data to measured against yard -sticks. Of performance or of sound financial condition.
2. Accounting ratios play a significant role in cost accounting, financial accounting, budgetary control and auditing.
3. It guides management in formulating future financial plans and policies.
4. Accounting ratios provide greater clarity, meaning to the data and it brings out information not otherwise apparent.
5. Accounting ratios measure profitability and solvency of a business concern.
6. It facilitates monetary figures of many digits to be condensed into two or three digits, which enhance the managerial efficiency.
7. From ratio analysis, it is possible without any difficulty, to have a general impression of the past performance of the business and is possible to have a forecast about the uncertain future.
8. Accounting ratios are one of the factor which accelerates the development of the art in the field of financial management.

1.3 LIMITATIONS OF RATIO ANALYIS

Accounting ratios are not free from some limitations. These are :

1. Rather than the actual ratios and percentages, the trend of the result is more important. Structural relationships, ascertained from the financial statements of a single year only, are of limited value. The trends of these structural relationships ascertained from statements of a series of years may be more useful than absolute ratios.
2. Standard ratios, predictive analysis and budgeting are often more useful to management than ratios obtained by the analysis of past results. But in analyzing financial statements, the accountant is bound to use historical financial statements.

3. It is also important fact that one specific ratio used without reference to other ratios may be misleading. In arriving at a correct diagnosis, the combined effect of the various ratios must be considered which will be of assistance in appropriate interpretation. Each ratio has its own role in this interpretation.

4. Unless and unit the accounts have been prepared on uniform basis, inter-firm comparison through accounting ratios becomes misleading. Similarly unless the accounts have been prepared on consistent basis over the periods, even in the same unit same ratios over a number of periods may not carry the same meaning.

5. It must be admitted that ratios are only a preliminary step in interpretation and must be supplemented by deeper investigation before some conclusions can be drawn from them. They may be useful in attracting attention to the aspect (s) of the business which require further analysis and investigation.

6. From the above points, it can be stated that ratio analysis can be regarded "only as an aid to making, judgement and not a substitute to judgement."

1.4 POINTS TO REMBMER

Ratio analysis is an important means of expressing the relationship between two numbers. A ratio can be ascertained from any pair of figures. A ratio must represent a meaningful relationship to achieve its objectives, but the use of ratios can not substitute studying the underlying data.

Ratios are guides or indicators that are useful in evaluating the financial position and operations of a company and in comparing them to previous years or to other companies. The main purpose of ratios is to pinpoint the areas for further investigation. They should be used in connection with a general understanding of the business enterprise and its environment.

To outsiders are also benefited by the study a accounting ratios. They can judge the position of business enterprise particularly with regard to the following aspects in which they are mainly interested:

(i) Short-term or long-term solvency of the business as well as its liquidity position.

(ii) The profitability or the earning capacity of the business.

Ratio analysis is useful to management in pointing out specific areas that reflect improvement or deterioration as well as detect any point of trouble area that may hamper the attainment of objectives.

Accounting ratios are not free from some limitations. Therefore, ratio analysis can be regarded 'only as an aid to making judgement and not a substitute to judgement.'

1.5 KEY WORDS

Ratio Analysis : Ratio analysis is one of the popular tools of financial statement analysis. Ratio is the quotient formed when one magnitude is divided by another measured in the same unit. A ratio is defined as "the indicated quotient of two mathematical expressions " and as "the relationship between two or more things". Usually the ratio is stated as a percentage.

Solvency : This indicates the ability of a business enterprise to repay its debts in time to creditors. A satisfactory solvency position ensures safety to both long-term and short-term debts due to creditors or bankers.

Liquidity : Liquidity refers to the status of convertibility of assets (namely, current assets) into cash. If a company has insufficient current assets in relation to its current liabilities, it might be unable to meet its commitments, and be forced into liquidation.

1.6 SELF ASSESSMENT QUESTIONS

1. What do you understand by "Accounting Ratios"? State their significance in the analysis of financial statements.

2. Discuss the purposes of accounting ratios. Also explain the need for the study of accounting ratios.
3. "A device for making financial data more meaningful is to reduce them to ratios." Elucidate the statement.
4. Describe the advantages that are derived from ratio analysis.
5. State the main limitations of ratio analysis.
6. "Ratios are mechanical and incomplete." Explain this statement.

1.7 FURTHER READING

Safah, M.A., "Management Accounting : Principles and Practice", Ashish Publishing House, New Delhi - 26.

Block 4

Unit 2 : DIFFERENT MODES OF EXPRESSING RATIOS ; ANALYSIS AND INTERPRETATION OF DIFFERENT RATIOS ACCORDING TO CONVENTIONAL AND FUNCTIONAL CLASSIFICATION

Structure :

2.0 Objectives

After going through this unit you should be able to :

- Describe the different modes of expressing ratios.

- Identify the different ratios according to conventional classification.
- State the different ratios according to functional classification.
- Make analysis and interpretation of different ratios according to conventional and functional classification.

2.1 DIFFERENT MODES OF FEXPRESSING RATIOS

Ratio analysis is the process of determining and interpreting numerical relationship between two figures taken from the financial statements. In other words the relationship of one item to another expressed in a simple arithmetical form is called a ratio. This relationship may be expressed in different modes of expressing ratios.

(i) Percentages, for example, cost of goods sold is 60% of the net sales or

(ii) As a quotient, for instance, current assets are 1.80 times the current liabilities.

This relationship or ratio between current assets and current liabilities is determined by dividing the amounts of current liabilities. Suppose, current assets are Rs.20,00,000 and current liabilities Rs.10,00,000; then Rs.20,00,000 should be divided by Rs.10,00,000 to establish the relationship between the two.

$$\frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{\text{Rs. 20,00,000}}{\text{Rs. 10,00,000}} = 2$$

This relationship or ratio are twice the current liabilities.

1. Current assets are twice the current liabilities.
2. There are Rs. 2 of current assets to meet every Re.1 of current liabilities.
3. That the current assets are 200% of the current liabilities.
4. That the ratio of current assets to current liabilities is 2 : 1.

In whatever way the ratios are expressed they give deep meaning to the financial data and facilitate its interpretation.

Analysis may be made for an internal purpose, i.e. for the purpose of management. For this purpose varied and detailed data would be available within the organization. However, the analysis made by outsiders are generally based upon published statements. The ratios discussed here are mainly on the basis that such analysis is undertaken for the purpose required by the management.

The management will be interested in evolving analytical tools which will help in measuring costs, efficiency, liquidity and profitability.

2.2 CONVENTIONAL OR STRUCTURAL OR STATEMENT CLASSIFICATION OF RATIOS

(A) BALANCE SHEET RATIOS

(i) Current Ratio (Solvency Ratio) : This ratio is also known as working capital ratio. It is ascertained by dividing the amount of current assets by the amount of current liabilities. Suppose current assets are Rs.5,00,000 and current liabilities Rs.2,50,000, then the current ratio will be :

$$\frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{\text{Rs. 5,00,000}}{\text{Rs. 2,50,000}} = 2 \text{ to } 1 \text{ or } 200\%$$

It means that for payment of current liability of Re.1 current assets to the tune of Rs. 2 are available. In other words, for payment of current liability of Rs.100 current assets worth Rs.200 are available.

The current ratio is considered as a test of solvency of the business enterprise. It shows the short-tem financial strength. It indicates the extent of protection of the current creditors of the business entity.

It is contended that for the industrial or commercial concerns the desirable current ratio should be 2:1. In other words, the current assets should be twice the current liabilities so as to ensure that the financial position of the business is should and that it will be able to meet its commitments. In fact 1 : 1 should be sufficient in the sense that the enterprise has as much amount of current assets as are current liabilities. However, in practice it is noticed that recovery from these assets gets delayed and the

commitments have to be discharged in time to keep the credit of the business. Therefore it is suggested that there should be safe margin between current assets and current liabilities. The margin of 2:1 i.e., current assets being twice the current liabilities, in the ordinary course of business, provide a safe margin so that even though current assets are reduced to half the business will still be able to meet its Commitments.

Illustration :

The following are the relevant figures from the Balance Sheet of the ABC Ltd. As on 31st December, 2005. Find out the Current Ratio and give your comments.

Liabilities	Rs.	Assets	Rs.
Bills Payable	15,000	Stock-in-trade…	95,000
Trade Creditor	78,000	Sundry Debtros…	63,000
Bank Overdarft…	28,000	Cash and Marketable	
		Securities …	50,000
		Loans and Advances	36,000
	1,21,000		2,44,000

Solution :

$$\frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{\text{Rs. 2,44,000}}{\text{Rs. 1,21,000}} = 2.01 : 1$$

Comment :

If 2 : 1 is accepted as a proper solvency ratio, this ratio suggests that the company would be able to discharge its commitments easily. This ratio indicates sound working capital position and also indicates efficient working capital management.

(ii) Liquid Ratio : The liquid ratio is designed to show the amount of cash available for meeting immediate payments. This ratio which measures solvency or liquidity is also called "acid test" or "quick assets" ratio.

It is ascertained by relating quick assets to quick liabilities.

Quick assets mean total current assets less stock-in-trade and pre payments. Stocks are not included as quick assets

because of the time required for manufacturing and selling them. Debtors are included in quick assets. It may be remembered that all the debtors may not be readily reliable where necessary stock up debtors may be deducted from total debtors. Quick liabilities are current liabilities les bank overdraft. Bank overdraft is excluded from quick liabilities because it is considered that bank overdraft is not likely to be called back immediately.

The term liquidity refers to the conversion of assets into the cash during the normal course of business.

This ratio provides more stringent test of the solvency of the business enterprise. It is, therefore, sometimes termed as a "solvency ratio".

$$\text{Liquid Ratio} = \frac{\text{Liquid Assets}}{\text{Current Liabilities - Bank Overdraft}}$$

$$\text{Or} \quad = \frac{\text{Cash + Marketable Investment + Sundry Debtors}}{\text{Current Liabilities - Bank Overdraft}}$$

Illustration :

The following are the relevant extract from the Balance Sheet of XYZ Ltd. As on 31st December, 2005. Ascertain the Acid Test Ratio and given your comments.

Liabilities	Rs.	Assets	Rs.
Bills Payable...	16,000	Stock-in-trade...	1,05,000
Sundry Creditors...	56,500	Sundry Debtors...	98,500
Bank Overdraft...	28,500	Cash and Bank Balances....	7,500
		Loans and Advances (short-term)...	2,23,000
	1,01,000		2,23,000

Solution:

$$\text{Acid Test Ratio} = \frac{\text{Cash \& Bank Balance + Debtors, Loans \& Advances}}{\text{Current Liabilities - Bank Overdraft}}$$

$$= \frac{1,18,000}{72,500}$$

$$= 1.62 : 1$$

Comment :

The Acid Test Ratio shows that the immediate solvency (liquidity) position of the enterprise is should which is 1.62.1 as against the standard Acid Test Ratio of 1:1.

(iii) Proprietory Ratio : Proprietory ratio represents the proportion of Proprietors' Equity to Total Assets.

$$\text{Proprietory Ratio} = \frac{\text{Proprietor's Equity}}{\text{Total Assets}}$$

The most convenient way of expressing this ratio is in percentages. This ratio suggests the extent of proprietors' investment in the total investment of the business enterprise. The ratio can not exceed 100%. If the ratio is 100%, i.e. if entire investment in total assets is made by proprietors only, it would mean that there are no outside liabilities and the financial condition of the business is very good. Proprietory ratio is a test of capitalization. High proprietory ratio is an indication of sound financial position but in such a case the return will normally be low. High ratio would also mean inefficient use is being made of external finance. In fact, successful financial management requires a balanced use of internal and external resources to maximize the profit and rate of return.

Higher proprietory ratio is views with favour from the creditors as they get larger protection.

Illustration :

The relevant extracts from the Balance Sheet of the ABC Ltd. As on 31st December are presented here. Ascertain the Proprietory Ratio and give your comment.

Liabilities	Rs.	Assets	Rs.
Equity Share of Rs. 100 each fully Paid-up	8,000	Fixed Assets (Net Block)	1,85,000
Preference Share of Rs. 100 each fully paid-up.	1,50,000	Current Assets :	
Capital Reserve...	26,000	Debtors ...	85,000
Revenue Reserve...	54,000	Inventory ...	90,000
Debentures...	18,000	Bills Receivable	20,000
Creditors...	52,000		
	3,80,000		3,80,000

Solution :

$$\text{Proprietory Ratio} = \frac{\text{Shareholder's Funds}}{\text{Total Assets}} = \frac{\text{Rs. 3,10,000}}{\text{Rs.3,80,000}}$$

$$= 0.812 \text{ or}$$

$$= 81.2\%$$

Comment :

It mean that 81.2% of the total value of the assets are finance out of the proprietors' funds consisting of own contribution and accumulated profits. This is a good position in as much as most of the investment is finance by the proprietors. However, such a high ratio would indicate insufficient use of outside resources.

iv) Debt-Equity Ratio:

Debt-equity ratio establishes the relationship between owned fund and the borrowed funds. It reflects the extent to which borrowed capital is used in place of equity capital. Business firms acquire assets both with owners' and creditors' funds. The larger the portion of funds provided by owners, the less risk is assumed by creditors. The debt-equity ratio is ascertained as :

$$\text{Debt-Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Owner's Equity}}$$

This ratio represents the proportion of external equity to internal equity in the capital structure of the firm. The external equity implies the amount of debt / liabilities to outsiders. It includes both short-term and long-term liabilities. On the other hand owner's equity includes all such liabilities that belong to the shareholders, viz. share capital, reserves and surpluses. But at the same time, the accumulated losses and deferred expenses are to be deducted from the owner's equity in the calculation of debt-equity ratio.

Too high or too low a ratio may be disadvantageous. Too high ratio implies that management is not taking the opportunities of maximizing profits through borrowing. Too low ratio suggests undue exposure to risks of bankruptey and to a fixed burden of interest expense in the event of relatively low profit.

As a rule, debt-equity ratio of less than 1.00 is considered as acceptable although this is not based on any scientific analysis. As the ratio increases, the amount of risk assumed by creditors increases, because the ratio signifies decreasing solvency. In reality the acceptable level of ratio will vary from firm to firm. For instance financial institutions will have much high debt-equity ratio as compared to trading or manufacturing concerns.

Illustration:

From the following Balance Sheet you are required to calculate the Debt-Equity Ratio. Also give your comments.

Balance Sheet

Liabilities	Rs.	Assets	Rs.
3,000 Equity Share @ Rs.100 each	3,00,000	Buildings ...	2,50,000
		Furniture...	40,000
		Machinary...	2,10,000
7% Debentures...	1,50,000	Stock...	60,000
Reserves and Surplus ...	80,000	Debtors...	30,000
Sundry Creditors...	30,000	Cash Balances...	20,000
Bills Payable...	50,000		
	6,10,000		6,10,000

Solution:

$$\text{Liquid Ratio} = \frac{\text{Total Debt}}{\text{Total Owner's Equity}}$$

$$= \frac{\text{Rs. 2,30,000}}{\text{Rs.3,80,000}}$$

$$= 0.61 \text{ (approx)}$$

Comment :

The proportion of total debt to total owner's equity is 61% which implies that external debts (both short-term and long-term) are adequately secured. If profitability is high enough to meet the interest commitments on external debts, it will simultaneously lead to increased return to Equity Shareholders.

(v) Capital Gearing Ratio:

This ratio indicates the relation which a capital entitled to a fixed rate of dividend bears to the ordinary capital. In other words, this ratio indicates the relationship of proportion between equity capital which is entitled to unlimited rate of return to preference capital plus debentures which are entitled to fixed rate of return. Where capital carrying a fixed rate of dividend is greater in proportion to the ordinary share capital then the capital structure of the company is said to be highly geared. On the other hand, if equity capital is higher than the preference capital and debentures, the capital is said to be low geared.

Since dividend on equity capital can not be paid until provision has been made for debenture interest and preference dividend, if the capital is highly geared the equity shareholders would bet less return.

However, if the capital is low geared, the equity shareholders would receive more benefit. If the rate of profit earned on total paid up capital is higher than that of the rate of preference dividend and debenture interest ordinary shareholders benefit and the company is said to be "Trading on the Equity"

$$\text{Capital Gearing Ratio} = \frac{\text{Preference Capital (Paid up) + Debentures}}{\text{Equity Share Capital (Paid up) + Reserve \& surplus}}$$

Illustration :

The following are the relevant extracts from the Balance Sheet of the Pioneer Toys. Ltd. As on 30th June, 2006. Find out the Capital Gearing Ratio.

Liabilities		**Rs.**
800 Equity Shares of Rs.100 each fully paid	…	80,000
1,600 7% Preference Shares of Rs.100 each fully paid	…	1,60,000
Debentures … …	…	40,000
Capital Reserve… …	…	16,000

Solution:

$$\text{Capital Gearing Ratio} = \frac{\text{Preference Capital}}{\text{Equity Share Capital}} = \frac{\text{Rs.1,60,000}}{\text{Rs.96,000}}$$

$$= 2$$

$$\frac{\text{Preference Share Capital + Debentures}}{\text{Equity Share Capital + Reserve}} = \frac{\text{Rs.1,60,000}}{\text{Rs.80,000}}$$

$$= 2.08$$

Comments :

Here, capital is highly geared. Equity shareholders will receive dividend only after large amount is paid to the preference shareholders by way of dividends. But if the profitability of the company is very high the balance of profit will be distributed among small number of Equity holders who will get larger rate of return.

(vi) Stock to Working Capital Ratio:

This ratio is ascertained by dividing the inventory value by the cost of working capital. This ratio which is related to quick assets ratio or acid test ratio, is used to draw attention to possible reduction in working capital that may result from a fall in inventory values.

Illustration:

The following are the relevant extracts from the Balance Sheet of the Prime Wood Ltd. As on 31st December, 2005. Calculate the Stock to Working Capital Ratio and give your comment.

Liabilities		Rs.	Assets	Rs.
Sundry Creditors	...	1,70,000	Inventory	1,75,000
Bills Payable	...	10,000	Cash in hand and Bank	
Unclaimed Dividend	...	800	Balance...	8,500
Provision for Taxation	...	15,200	Sundry Debtors...	1,85,000
			Bills Receivables...	21,500

Solution:

$$\text{Stock to Net Working Capital Ratio} = \frac{\text{Inventory}}{\text{Net Working Capital}} = \frac{\text{Rs. 1,75,000}}{\text{Rs. 1,94,000}}$$

$$= 0.902 \text{ to } 1$$

Comment:

The inventory is almost equal to the net working capital. If the inventory is sufficiently liquid, i.e., if it is readily reliable this ratio should be considered satisfactory. This rate is related to acid test ratio which draws attention to a possible reduction in working capital. This ratio should, however, be studied alongwith the sales to cost of sales ratio and sales to inventory ratio.

(B) REVENUE STATEMENT RATIOS

An indepth analysis of the various items set out in the income statement is of great significance because success of the business ultimately depends upon the profitability of the enterprise. Management would be interested in knowing the factors responsible for earning profit and those which are drawn on the revenues. For instance, management might have set the goal that all the operating expenses should not exceed 20% of

net sales and the total commission paid should not exceed 5% of the net sales. In order to see whether the goal is achieved it would be necessary to determine the ratio and find out whether the goal is achieved or not. The following are the important revenue ratios.

(i) Gross Profit Ratio
(ii) Net Profit Ratio
(iii) Expense Ratio
(iv) Operating Ratio
(v) Stock Turnover Ratio

(i) Gross Profit Ratio:

This ratio is known as Gross Profit Ratio, Turnover Ratio or Gross Profit to Turnover Ratio. It is ascertained as under:

Gross Profit

This ratio is known as Gross Profit Ratio, Turnover Ratio or Gross Profit to Turnover Ratio. It is ascertained as under:

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Net Sales}} \text{ or } \frac{\text{Gross Profit}}{\text{Turnover}}$$

This ratio may be expressed in pcercentages

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Turnover}} \times 100$$

This ratio is of immense significance is measuring the business results. The Gross Profit should absorb all the expenses leaving profit for the owners. Whether this is possible or not can be judged by testing this ratio. High gross profit ratio would normally suggest high rate of profit and the low ratio would suggest low rate of profit. However, before coming to the conclusions analyst must make proper inquiry into the causes of high or low ratio.

Illustration :

The following are the relevant extracts from the Trading, Profit & Loss Account of the Peacock Co. Ltd. For the year ended 31st December, 2005. Calculate the Gross Profit Ratio. Also give your comment.

Trading Account

	Rs.		Rs.
To opening Stock	16,000	By Sales	2,58,500
To Purchases	2,12,500	Less Returns	8,500
			2,50,000
To Gross Profit	40,000	By Closing Stock	18,500
	2,68,500		2,68,500

Comment :

The Gross Profit Ratio is 16% . This ratio is not the final test of the profitability of the concern. This ratio should be cross checked by net profit ratio and operating ratio.

(ii) Net Profit Ratio:

This ratio is ascertained by making a comparison of net profit and net sales. It indicates the relationship between the net profit and net sales in terms of percentages.

This ratio of net profit to net sales indicates the portion of profit which is left for the proprietors after all the expenses are met. When compared with the desired ratio, this ratio reveals whether the return to the proprietors is adequate and whether it is commensurate with the desired rate of return.

High net profit ratio is obviously a welcome symptom as against low net profit ratio. However the ratio may be high for a temporary period due to boom in the market or specially favourable market conditions.

It may be due to external forces, too. Before relying upon this ratio, causes of changes in the ratio must be properly analysed. However, consistently high ratio reflects the efficiency of the business operations.

Illustration:

The following are the relevant figures taken from the Trading and Profit & Loss Account to the XY Co. Ltd. For the year ended 31st December, 2005. Ascertain the Net Profit Ratio.

Net Sales ... Rs.5,00,000
Net Profit ... Rs. 1,00,000

Solution:

$$\text{Net Profit Ratio} = \frac{\text{Net Profit}}{\text{Net Sales}} \times 100 = \frac{1,00,000}{5,00,000} \times 100$$

$$= 20\%$$

(iii) Expense Ratio :

This ratio expresses the percentage of each item of expenditure or a group of items of expenditure in relation to Net Sales.

This ratio is valuable for the purpose of ascertaining whether and to what extent individual expenses vary with different trading periods. In other words, the ratio reveals the behaviour of each item of expenditure(or group of items) to net sales at different periods.

Illustration:

The following are the relevant extracts from the Trading and Profit & Loss Account of the S.Co. Ltd. for the year ended 31st December 2005. Calculate various expense ratios.

	Rs.		Rs.
To Opening stock	31,000	By Sales ...	3,00,000
To Purchases	1,60,000	By Closing Stock ...	47,500
To Gross Profit	1,56,500		
	3,47,500		3,47,500
To Administrative Expenses ...	47,800	By Gross Profit b/d	1,56,500
To Finance Expenses	3,500		
To Selling and Distribution expenses	12,000		
To Net Profit ...	93,200		
	1,56,500		1,56,500

Solution:

1. Ratio of selling & Distribution Expenses to Net Sales :

$$= \frac{\text{Selling and Distribution Expenses}}{\text{Net Sales}} \times 100 = \frac{\text{Rs.12,000}}{\text{Rs. 3,00,000}} \times 100 = 4\%$$

2. Ratio of Administrative Expenses to Net Sales :

$$= \frac{\text{Administrative Expenses}}{\text{Net Sales}} \times 100 = \frac{\text{Rs.47,800}}{\text{Rs. 3,00,000}} \times 100 = 15.9\%$$

3. Ratio of Finance Expenses to Net Sales :

$$= \frac{\text{Finance Expenses}}{\text{Net Sales}} \times 100 = \frac{\text{Rs.3,500}}{\text{Rs. 3,00,000}} \times 100 = 1.16\%$$

4. Operating Ratio :

This ratio shows the relationship between operating expense i.e. cost of goods sold plus other operating expenses to Net Sales.

The main function of this ratio is to ascertain the efficiency of the management as regards business operations.

The term operating expenses include all expenses i.e. cost of goods sold, administrative, selling, distrubiton expenses, interests, general charges and depreciation. Financial charges e.g., interest should not be considered while calculating this ratio.

This ratio is ascertained as under:

$$\text{Operationg Ratio} = \frac{\text{Cost of goods sold + Operating Expenses}}{\text{Net Sales}}$$

This ratio is usually expressed in percentages.

Illustration :

The following are the relevant extracts from the Trading and Profit & Loss Account of a company for the year ended 31st December, 2005. Calculate the operating Ratio and give your comments.

		Rs.		Rs.
To opening stock	...	62,000	By Sales ...	6,00,000
To Purchases	...	3,20,000	By Closing	
To Gross Profit c/d	...	3,13,000	Stock	95,000
		6,95,000		6,95,000
To Administrative Expenses		85,500	By Gross Profit b/d	3,13,000
To Interest	...	6,500		
To Selling and Distribution Expenses		23,000		
To Net Profit c/d		1,98,000		
		3,13,000		3,13,000

Solution :

Operating Expenses:

(i) Cost of goods sold :

		Rs.	Rs.
	Opening stock ...	62,000	
	Purchases ...	3,20,000	
		3,82,000	
	Less : Closing stock ...	95,000	
(ii)	**Other operating Expenses**		**2,87,000**
	Administrative Expenses...	85,500	
	Interest ...	6,500	
	Selling & Distribution Expenses	23,000	
			1,15,000
		Total	4,02,000

$$\text{Operationg Ratio} = \frac{\text{Cost of goods sold + Operating Expenses}}{\text{Net Sales}}$$

$$= \frac{\text{Rs. 4,02,000}}{\text{Rs. 6,00,000}}$$

= 0.67 or 67%

Comment :

Operating ratio indicates the cost of operations. Its purpose is to ascertain the efficiency of the management as regards operations. Higher the operational cost lesser the net profit margin. The ratio is 67% leaving 33% for the proprietors of the business. This indicates the efficiency of the management.

However, in interpreting the operating ratio full recognition should be given to the variations in individual items of expenses from year to year, particularly those changes which are due to to changes in accounting procedures and management policies.

(v) Stock Turnover Ratio :

This ratio relates to number of items the stock is turned over on an average during the accounting period. It suggests the period within which stocks are to be replaced.

This ratio is ascertained by dividing the cost of goods sold by the average stock held.

Thus, if the cost of goods sold is Rs.2,15,000 and the average stocks held are Rs.64,000 then the ratio would be :

$$\frac{\text{Cost of goods sold}}{\text{Average stock held}} = \frac{\text{Rs. 2,25,000}}{\text{Rs. 64,000}} = 3.5$$

It means the stocks in this case turn 3.5 times a year i.e. $\frac{52 \text{ weeks}}{3.5} = 15$ i.e. every 15 weeks.

Often difficulty is experienced in finding out average stocks held. Where monthly stock records are available it would be possible to find out average stocks from these records. But often it is experienced that opening and closing stock figures only are available. In such a case, average stock held will be found by averaging these stock values.

		Rs.
Opening stock	....	84,000
Closing stock	....	1,26,000
Total	....	2,10,000
Average stock held	....	1,05,000

Normally higher frequency of stock turnover means larger sales and more profitable business. But it the stock turnover is comparatively lower and if it is falling, it is a danger signal.

Illustration:

The following is the Trading Account of the M.Co. Ltd. as on 31st December, 2005. Calculate the Stock Turnover Ratio and give your comment.

	Rs.		Rs.	Rs.
To Opening stock	40,500	By Sales	1,80,000	
To Purchases	1,11,500	Less : Returns	15,000	
				1,65,000
To Freight	3,850	By Closing stock		39,500
To Gross Profit	48,600			
	2,04,500			2,04,500

Solution :

Cost of Goods sold :

		Rs.
Opening stock	...	40,500
Purchases	...	1,11,550
Freight	....	3,850
		1,55,900
Less : Closing stock	....	39,500
		1,16,400

Average Stock :

Opening Stock	...	40,500
Add : Closing stock	....	39,500
		80,000

$$\text{Average Stock } \left(\frac{\text{Rs.80,000}}{2}\right) \quad ... \quad 40,000$$

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average Stock}}$$

$$= \frac{\text{Rs.1,16,400}}{\text{Rs. 40,000}}$$

$$= 2.91 \text{ Times}$$

Comment :

It means stock turns ove 2.91 times a year. Therefore, within how many weeks the stocks turnover on an average, can be found by

$$= \frac{52}{2.91} = 17.86 \text{ weeks}$$

(c) COMPOSITE RATIOS

Composite ratio establishes a relationship between the two figures, one appearing in Balance Sheet and the other in Profit and Loss Account. Composite ratios consist of the following:

(i) Ratio of Return on Proprietors' Equity
(ii) Ratio of Return on Ordinary Share Capital
(iii) Ratio of Return on Capital Employed, or
Ratio of Return on Total Resources

(iv) Ratio of Turnover of Debtors.

(v) Ratio of Turnover of Fixed Assets.

(vi) Ratio of Turnover of Total Assets.

(vii) Ratio of Turnover of Capital Employed.

(i) Ratio of Return on Proprietors' Equity:

The ratio of return on Proprietors' equity represents the earning power of the funds invested in the business by the proprietors. This ratio enables the shareholders to know the percentage of profit earned on the amount invested by them in the business. In other words, this ratio measures the return on investment by the proprietors, in the form of profit. Hence, this ratio is also known as "Return on Priprietors' Funds" or "Earning Proprietory Ratio".

This ratio is ascertained as under:

$$\text{Ratio of Return on Proprietors' Equity} = \frac{\text{Net Profit}}{\text{Proprietors' Equity}}$$

This ratio is of very practical interest to proprietors and to those who wish to invest funds in the business enterprise. This ratio enables them to gauge earning capability of the business and enable them to make a comparison with similar business in the same industry. This ratio give idea whether adequate return is being achieved at given risks.

Illustration:

The following are the relevant extracts from the Profit & Loss Account and Balance Sheet of the C.S. Co. Ltd. and on 31st December, 2005.

Profit & Loss Account

For the year ended 31.12.2005

	Rs.		Rs.
To Administrative Expenses ...	80,000	By Gross Profit ...	2,00,000
To Selling & Distribution Expenses...	27,000		
To Finance Expenses	13,000		
To Net Profit c/d	80,000		
	2,00,000		2,00,000

Balance Sheet

As at 31st December, 2005

	Rs.	Rs.
Share Capital :		
600 7% Preference Share of Rs. 100 each fully paid ...	60,000	
1,500 Equity Shares of Rs. 100 each paid...	1,50,000	
		2,10,000
Reserves :		
General Reserve	40,000	
Capital Redemption Reserve ...	30,000	
Dividend Equalisation Fund ...	20,000	
		90,000
		Rs. 3,00,000

Solution :

Ratio Return on

$$\text{Proprietors' Equity} = \frac{\text{Net Profit}}{\text{Shareholders' Fund}}$$

$$\text{Proprietors' Equity} = \frac{\text{Rs. 80,000}}{\text{Rs. 3,00,000}}$$

$$= 0.266 \text{ or } 26.6\%$$

Comment :

This ratio is quite satisfactory. High ratio is a symptom of business efficiency. This ratio would attract both the classes of people, i.e. investors and creditors and would as well help the business external finance. However, before relying upon this

ratio comparison should be made with the similar ratio of other enterprises in the same class of industry.

(ii) Ratio of Return on Ordinary Share Capital:

This ratio helps in measuring the return available on the funds supplied by the ordinary shareholders, to the exclusion of the preference shareholders. This ratio relates the net profit (less the amount necessary for paying the dividend to preference shareholders) or the ordinary capital. This ratio is designed to show what percentage of the net profit for the period bears to the amount of capital invested by the ordinary shareholders.

$$\text{Ratio of Return on Ordinary capital} = \frac{\text{Net Profit (less Preference dividend)}}{\text{Ordinary Capital}} \times 100$$

If the perference shares are Participating, Preference Share then in that case the furthe amount required to be paid to them must be deducted from net profit before this ratio is worked out.

Illustration:

The following are the extracts from the Profit and Loss Appropriation Account and Balance Sheet of the BS Co. Ltd. as on 31.12.2005.

Balance Sheet

(As at 31.12.2005)

		Rs.
600, 7% Preference Shares of Rs. 100 each fully paid	...	60,000
1,500 Equity Shares of Rs.100 each fully paid	....	1,50,000

Profit & Loss Appropriation Account

(For the year ended 31.12.2005)

	Rs.		Rs.
To Proposed Dividends :		By Net Profit b/d	40,000
Preference	4,800		
Equity	15,000		
	19,800		
To Provision for Taxation	15,000		
To Balance c/d.	5,200		
	40,000		40,000

Solution :

Ratio of Return on Ordinary Capital :

		Rs.
Net Profit	...	40,000
Less : Dividend		
Preference Shareholders		4,800
		35,200

$$\frac{\text{Net Profit}}{\text{Ordinary Capital}} = \frac{\text{Rs. 35,000}}{\text{Rs. 1,50,000}} \times 100$$

$$= 23.46\%$$

(iii) Ratio of Return on Capital Employed or Ratio of Return on Total Resources :

This ratio is determined by ascertaining the relationship between net profit and the total resources employed in the business.

Net Profit may be total net profit as stated in Profit & Loss Account or operating net profit which is arrived at by excluding the items of incomes and expenses of non-recurring and exceptional nature.

This ratio is an indicator of the earning power of the business. It reveals how profitably the management has employed resources at its disposal. Obviously higher ratio will indicate better management performance.

$$\text{Ratio of Net Profit to Total Assets} = \frac{\text{Net Profit}}{\text{Total Assets}}$$

$$\text{Ratio of Operating Net Profit to Total Assets} = \frac{\text{Operating Net Profit}}{\text{Total Assets}}$$

Illustration :

The following are the relevant extracts from the Trading, Profit & Loss Account and Balance Sheet of the K.S. Ltd., as on 31st December, 2005.

Balance Sheet

(As at 31st December, 2005)

Assets		Rs.	Rs.
Fixed Assets ...			1,82,000
Current Assets :			
Debtors	...	62,000	
Stock in trade	...	12,000	
Bills Receivable...		4,500	
Cash in Bank ...		16,500	
			95,000
		Rs.	2,77,000

Trading and Profit & Loss Account
(For the year ended 31st December, 2005)

		Rs.			Rs.
To Opening Stock	...	18,000	By Sales	4,38,000	
To Purchases	...	3,60,000	Less :		
		3,78,000	Return	12,000	
				4,26,000	
Less : Closing stock		26,000			
Cost of Sales....		3,52,000			
To Gross Profit c/d		74,000			
		4,26,000			4,26,000
To Establishment Expenses		4,000	By Gross Profit b/d		74,000
To Administrative Expenses		32,000			
To Selling & Distribution Expenses		4,000			
To Finance Expenses	...	1,000			
To Net Profit c/d		3,000			
Total		Rs. 74,000	Total		Rs. 74,000

Solution :

Ratio of Return on Total Resources :

Operating Net Profit to Total Assets :

$$\frac{\text{Operating Net Profit}}{\text{Total Assets}} = \frac{\text{Rs. 33,000}}{\text{Rs. 2,77,000}} = 0.119 \text{ or } 11.9\%$$

(iv) Ratio of Turnover of Debtors :

This ratio shows the time lag between the sales and the collection from debtors. It shows the normal period for which sundry debtors are outstanding. This ratio indicates the level of efficiency of the credit policies and working of the collection departments.

The amount of total credit sales is divided by 365 to find out average daily credit sales. The total debtors and bills receivables should then be divided by the daily average credit sale to find this ratio.

		Rs.
Total Sales	...	6,30,000
Less : Cash Sales	...	30,000
Credit Sales	...	6,00,000
Total Debtors	...	80,000
Bills Receivables	...	70,000
Total Receivables	...	1,50,000

$$\text{Average Daily Credit Sales} = \frac{\text{Rs. 6,00,000}}{365} = \text{Rs.1,644}$$

$$\frac{\text{Total Receivables}}{\text{Average Daily Credit Sales}} = \frac{\text{Rs. 6,00,000}}{\text{Rs.1,644}} = 91 \text{ days}$$

Thus the debtors turn over within 91 days. If the policy of the enterprise is to allow 90 days' this ratio confirms that the policy is properly followed. But suppose, the credit period is 60 days and this ratio shows that the credits period has been unduly extended and the management must find the causes for the same. It is likely that some debtors are stuck up or there may be dispute relating to prices, quality or goods with major debtors.

The ratio also suggests the period for which money remains blocked with debtors. Management might test the advisability of investing the funds with the debtors.

Illustration:

The following are the relevant extracts from the Trading Account and Balance Sheet of B.C. Ltd. as on 31st December, 2005. Calculate the ratio of turnover of debtors.

Balance Sheet

(As at 31st December, 2005)

Current Assets, Loans and Advances:

		Rs.	Rs.
Sundry Debtors	...	64,000	
Stock-in-trade	...	41,800	
Bills Receivable	...	6,000	
Cash in Bank	...	12,560	
			1,24,360

Trading Account

(For the year ended 31st December, 2005)

			Rs.	Rs.
By Sales	...	...	3,16,400	
Less : Returns	...	...	4,400	
				3,12,000

Solution :

Turnover of Debtors

$$\text{Average Daily Sales} = \frac{\text{Rs. } 3,12,000}{365} = \text{Rs.}854.79 \text{ or } = \text{Rs.}855$$

$$\text{No. of days' credit} = \frac{\text{Total Receivable}}{\text{Average Daily sales}}$$

$$= \frac{\text{Rs. } 70,000}{855}$$

= 81.8 or 82 days.

(v) Ratio of Turnover of Fixed Assets:

This ratio measures the efficiency in the utilisation of fixed assets. The ratio of sales of fixed assets measures the turnover of the plant and machinery and is expressed as under:

$$\text{Ratio of Turnover of Fixed Assets} = \frac{\text{Sales}}{\text{Net Fixed Assets}}$$

For example : Sales Rs. 2,60,000 and Fixed Assets Rs. 2,00,000

$$\text{Ratio of Turnover of Fixed Assets} = \frac{\text{Rs.2,60,000}}{\text{Rs. 2,00,000}}$$

$$= 1:3:1$$

It means that for every investment of Re.1 in fixed assets of the business, Rs.1.30 is the worth of sales. This ratio, thus, indicates the level of operational efficiency.

(vi) Ratio of Turnover of Total Assets :

This ratio measures the overall performance and activity of the business organisation. It is computed by dividing sales by total assets. The following formula is applied to compute this ratio.

$$\text{Ratio of Turnover of Total Assets} = \frac{\text{Sales}}{\text{Total Assets}}$$

Illustration :

Compute the Ratio of Turnover of Total Assets from the following particulars:

			Rs.
Sales	...	...	5,60,000
Less : Returns			60,000
Assets :			
Fixed	1,50,000		
Current	1,00,000		
	Rs. 2,50,000		

Solution :

$$\text{Ratio of Turnover of Total Assets} = \frac{\text{Sales}}{\text{Total Assets}}$$

$$= \frac{\text{Rs. 5,00,000}}{\text{Rs.2,50,000}}$$

$$= 2 : 1$$

Comment :

It means that for every investment of Re.1 in total assets of the business, Rs.2 is the worth of sales. This ratio thus indicates that the total assets investments have been very gainfully utilised in the business.

(vii) Ratio of Turnover of Capital Employed:

This ratio indicates how many capital turned over during a given period. High turnover rate reflects higher profitability of business. This ratio is an indicator of managerial efficiency.

In other words, this ratio shows the extent to which capital employed contributes towards sales and is measured by :

$$= \frac{\text{Sales}}{\text{Capital Employed}}$$

This ratio is expressed in terms of TIMES.

For example, sales Rs.10,00,000 ; capital employed Rs. 2,50,000

Then the ratio of Turnover of Capital Employed would be as follows:

$$= \frac{\text{Sales}}{\text{Capital Employed}} = \frac{\text{Rs.10,00,000}}{\text{Rs.2,50,00}} = 4 \text{ times.}$$

The ratio, thus computed, implies that capital employed turns over 4 times during during the year. In othe words, capital employed turns over once in 3 months.

Illustration:

Compute the Ratio of Turnover of Capital Employed from the following particulars. Also give your comments.

		2004	2005
		Rs.	Rs.
Sales ...	...	6,00,000	7,50,000
Capital Employed	...	2,00,000	3,00,000

Solution :

$$\text{Ratio of Turnover of Capital Employed} = \frac{\text{Sales}}{\text{Capital Employed}}$$

2004	2005
$= \frac{\text{Rs. 6,00,000}}{\text{Rs.2,00,000}}$	$= \frac{\text{Rs.7,50,000}}{\text{Rs.3,00,000}}$
= 3 times	= 2.5 times

Comments :

The velocity of turnover of capital employed has decreased from 3 times in 2004 to 2.5 times in the year 2005. This might be due to the following reasons:

(i) Unscientific adoption of loan capital without proper diagnosis in the sales area.

(ii) Operational performance of the business appears to be unsatisfactory.

It should be noted that higher is the capital turnover ratio, better is the operational performace.

2.3 FUNCTIONAL OF PURPOSE CLASSIFICATION OF RATIOS

(a) LIQUIDITY RATIOS

(i) Current Ratio

(ii) Acid Test Ratio

(iii) Receivables (Debtors) Turnover Ratio

(iv) Inventory (Stock) Turnover Ratio

These ratios have been discussed in the conventional classification of ratios.

(b) LEVERAGE RATIOS

(i) Debt-Equity Ratio

(ii) Equity Ratio / Proprietory Ratio

These ratios have been discussed under the Balance Sheet ratios within the conventional classification.

(iii) Ratio of External Equities to Total Assets:

(Solvency Ratio)

This ratio measures the proportion of the firm's assets that are financed by creditors. The ratio of external equity to total assets is a variant of the proprietory ratio. To the creditor, a low ratio would ensure greater security for extending credit to the firm. However, a low too low ratio suggests that management is not using its credit most advantagenosly. This ratio is expressed as under.

$$\text{Solvency Ratio} = \frac{\text{External Equities}}{\text{Total Assets}}$$

The term external equities represent all debts both long-term as well as short term. On the other hand, total assets refer to total resources of the concern.

(iv) Fixed Assets to Net Worth Ratio (Ratio of fixed assets to proprietor's funds)

This ratio indicates the percentage contributed by owners to the value of the fixed assets. This ratio can be worked out as follows:

$$\text{Fixed Assets to Net Worth} = \frac{\text{Fixed Assets}}{\text{Net Worth}}$$

Fixed asset implies the cost of acquisition of fixed assets less the amount of depreciation thereon upto the period. The net worth means the amount due to the shareholders, i.e. share capital, reserves and surpluses. The financial experts contend that in manufactring concerns, the investment in plant should be made out of borrowed capital. Therefore a ratio of at least 1:1 is considered desirable. While a lower ratio suggests an undue burdern of debt on the enterprise tht tends to increase the internal rate at which an enterprise can borrow.

(v) Current Assets to Net Worth Ratio :

The ratio of current assets to net worth establishes the relationship between the current assets and net worth. In other words, it is a correlation between current assets and net worth. This ratio is expressed as :

$$\text{Current Assets to Net Worth Ratio} = \frac{\text{Current Assets}}{\text{Net Worth}}$$

The ratio means the extent to which shareholders' funds have gone into the financing of the current assets. It is useful to study the ratio of current assets to net worth with the ratio of fixed assets to net worth.

(vi) Interest Coverage Ratio:

A company is solvent if its revenue is more than its interest and other expenses. Likewise a company having sufficient revenue to meet only expenses and leaving nothing as net income is considered less solvent. Against the background, one of the aproaches to test the solvency of the company is interest coverage ratio.

This ratio measures how many times a company could pay its interest expenses which is calculated by dividing interest expenses into earning available for payment of interest expense. This ratio can be ascertained as:

$$\text{Interest coverage Ratio} = \frac{\text{Net Profit before interest and tax}}{\text{Fixed Interest charges}}$$

Interest Coverage Ratio measures the ability of a firm to protect the interests of long-term creditors. It is often stated that in order to ensure an adequate protection to the long-term creditors this ratio should be 2 or more.

Illustration:

From the following Balance Sheet you are required to calculate the ratios mentioned below the Balance Sheet.

Balance Sheet

Liabilities	Rs.	Assets	Rs.
6,000 Equity Shares		Buildings ...	5,00,000
@ Rs. 100 each ...	6,00,000	Machinery...	4,20,000
7% Debentures	3,00,000	Farniture ...	80,000
Reserves & Surplus	1,60,000	Stock...	1,20,000
Sundry Creditors	60,000	Debtors	60,000
Bills Payable	1,00,000	Cash Balance	40,000
	12,20,000		12,20,000

(i) External Equities to Total Assets Ratio.

(ii) Fixed Assets to Net Worth Ratio.

(iii) Current Assets to Net Worth Ratio.

Solution:

(i) External Equities to Total Assets Ratio $= \frac{\text{External Equities}}{\text{Total Assets}}$

$= \frac{\text{Rs. 4,60,000}}{\text{Rs.12,20,000}}$

$= 0.377$

(ii) Fixed Assets to Net Worth Ratio $= \frac{\text{Fixed Assets}}{\text{Net Worth}}$

$= \frac{\text{Rs. 10,00,000}}{\text{Rs.7,60,000}}$

$= 1.315$

(iiI) Current Assets to Net Worth Ratio $= \frac{\text{Current Assets}}{\text{Net Worth}}$

$= \frac{\text{Rs. 2,20,000}}{\text{Rs.7,60,000}}$

$= 0.289$

(c) PROFITABILITY RATIOS

(i) Gross Profit Margin Ratio

(ii) Net Profit Margin Ratio

(iii) Ratio of Return on Assets / Capital Employed

(iv) Ratio of Return on Owners' Equity

(v) Ratio of Return on Equity Capital

All these ratios have been explained earlier.

(vi) Earnings Per Share (EPS) :

This ratio is very popular and widely used indicator of profitability because it can be easily compared to the previous EPS and to the EPS of the companies. The earnings per share indicates average amount of net income earned by each equity share. This ratio is calculated with the help of the following formula:

$$\text{(ii) EPS} = \frac{\text{Net Profit after tax - Preference dividend}}{\text{No. of Equity shares}}$$

Illustration:

From the data given below, you are required to calculate the ratio of Earnings Per Share:

Capital :

5,000 7% Preference Shares
@ Rs. 100 each fully paid;
15,000 Equity Shares @ 100 each fully paid;

Assets:

		Rs.
1 - 4 - 2005	...	5,50,000
31-3-2006	...	7,00,000
Net Profit for the year (after tax)	...	1,75,000

Solution:

$$\text{Earnings Per Share (EPS)} = \frac{\text{Net Profit after tax - Prof. Divid.}}{\text{No. of Equity Shares}}$$

$$= \frac{\text{Rs. 1,75,000 - Rs. 35,000}}{\text{15,000}}$$

= Rs. 9.33

(d) ACTIVITY RATIOS

(i) Fixed Assets Turnover Ratio

(ii) Total Assets turnover Ratio

(iii) Inventory Turnover Ratio

(iv) Average Collection Period.

The first two ratios have been discussed under the composite ratios. The last two ratios have been disscussed under the liquidity ratios.

2.4 POINTS TO REMEMBER

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Acid Test Ratio} = \frac{\text{Liquid Assets}}{\text{Liquid Liabilities} \quad (\text{Current Liabilities - Bank Overdraft})}$$

$$\text{Proprietory Ratio} = \frac{\text{Proprietor's Equity}}{\text{Total Asset}}$$

$$\text{Debt - Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Owner's Equity}}$$

$$\text{Operating Ratio} = \frac{\text{Cost of goods sold + Operating Expenses}}{\text{Net Sales}}$$

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average stock held}}$$

$$\text{Ratio of Return on Capital Employed} = \frac{\text{Net Profit}}{\text{Total Assets}}$$

$$\text{Ratio of Turnover of Debtors} = \frac{\text{Total Receivables}}{\text{Average Daily Credit Sales}}$$

$$\text{Interest Coverage Ratio} = \frac{\text{Net Profit before interest and tax}}{\text{Fixed Interest Charges}}$$

$$\text{Earnings Per Share (EPS)} = \frac{\text{Net Profit after tax - Preference Dividend}}{\text{No. of Equity Shares}}$$

2.5 KEY WORDS

Liquidity : This indicates the liquidity position of the company. In other words, it refers to the immediate liquid assets like cash and assets which are immediately convertible into cash.

Leverage : Leverage is an indication of the use of company makes of borrowed funds to increase the return on owner's equity. Leverage measures the contribution of financing by owners compared with the financing provided by the firm's creditors.

Solvency : Solvency refers to the ability of the company to repay its debts. If it is unable to do so, then the company is insolvent. On the contrary, if it has the ability to repay its debts then it is solvent.

2.6 SELF ASSESSMENT QUESTIONS

1. Discuss the different modes of expressing accounting ratios.
2. Describe the different ratios as per the conventional classification.
3. Narrate the various ratios under the functional classification of ratios.
4. What do you understand by liquidity ratios, leverage ratios, profitability ratios and activity ratios?
5. Following are the accounting information obtained from the books of a limited company.

		Rs.
Sales ...	...	22,50,000
Cost of Goods sold	...	12,50,000
		10,00,000
Administrative Expenses		3,50,000
		6,50,000
Taxes...		4,00,000
Net Profits	...	2,50,000

Balance Sheet

Liabilities	Rs.	Assets	Rs.
Equity share Capital	7,50,000	Building	15,00,000
7% Preference Share Capital	15,00,000	Machinery	12,50,000
Reserves	2,50,000	Debtors	1,50,000
6% Debntures	4,00,000	Stock	1,50,000
Current Liabilities	2,50,000	Cash	1,00,000
	31,50,000		31,50,000

Opening stock was Rs.1,50,000 You may assume 360 days in a year.

Ascertain the following ratios:

(i) Current Ratio

(ii) Debt-Equity Ratio

(iii) Gross Profit Ratio

(iv) Net Profit Ratio

6. The following is the Balance Sheet of the A.K. Ltd. and on 31st December, 2005 :

Liabilities	**Rs.**	**Assets**	**Rs.**
Share Capital	4,00,000	Buildings	4,00,000
General Reserve	1,00,000	Machinery	3,00,000
Profit & Loss	61,000	Inventory	2,00,000
Bank Loan	1,40,000	Debtors	1,20,000
Sundry Creditors	3,00,000	Cash in hand	41,000
Provision for tax	60,000		
	10,61,000		10,61,000

You are required to comment on the liquidity position of the company.

7. The following is the Balance Sheet of the B.C. Ltd. for the year ended 31st December, 2005.

Balance Sheet

Liabilities	**Rs.**	**Assets**	**Rs.**
10,000 Equity shares		Fixed Assets	4,00,000
of Rs. 20 each	2,00,000	Stock	60,000
Reserves	40,000	Debtors	60,000
Profit & Loss A/C	60,000	Cash Balances	80,000
6% Debentures	1,60,000		
Trade Creditors	1,00,000		
Bills Payable	40,000		
	6,00,000		6,00,000

You are required to calculate:

(i) Debt-Equity Ratio

(ii) External Equities to Total Assets Ratio

(iii) Fixed Assets to Net Worth Ratio

(iv) Proprietory Ratio

8. Calculate the Average Collection Period from the information given below:

Total Sales	...	Rs.6,00,000
Cash Sales	...	20% of Net Sales
Sales Returns	...	Rs. 50,000
Total Debtors at the end of the year		Rs. 60,000
Bills Receivable at the end of the year		Rs.20,000
Provision for Bad Debts	...	Rs. 6,000

9. The following are the information taken from the financial statements of company:

(i)	Capital :	
	a) 7% 4,000 Preference Shares @ Rs.100 each fully paid	
	b) 8,000 Equity Shares @ Rs.100 each fully paid	
(ii)	Profit before tax	Rs. 15,00,000
(iii)	Rate of Tax	40%
(iv)	Depreciation	Rs.1,60,000
(v)	Market price of Equity Share	Rs.500
(vi)	Proposed dividend	25%

You are required to calculate the Earnings Per Share (EPS).

2.7 FURTHER READING

Sahaf, M.A., : "Management Accounting : Principles and Practice", Ashish Publishing House, New Delhi - 26.

BLOCK - 5
WORKING CAPITAL

WORKING CAPITAL - CONCEPT AND MANAGEMENT - PROJECTION OF WORKING CAPITAL REQUIREMENTS - (1) IN CASE OF TRADING ORGANISATION (2) IN CASE OF MANUFACTURING ORGANISATION

Block - 5 : comprises two unit

Unit 1 Discusses the meaning, concepts and importance of working capital. It also explains the factors affecting the amount of working capital.

Unit 2 Describes how to estimate the working capital requirements in case of trading organisation and manufacturing organisation.

UNIT - 1 WORKING CAPITAL - CONCEPT AND MANAGEMENT

Structure

1.0 OBJECTIVES

After going thorugh this unit, you should be able to :

- Explain the meaning, concepts and importance of working capital.
- Analyse the factors affecting the amount of working capital.
- Classify working capital and describe the working capital cycle.

1.1 MEANING OF WORKING CAPITAL

Working capital indicates the investment by a company in short-term assets such as cash, marketable securities, accounts receivable and inventories. Net working capital or net current assets refers to the current assets less current liabilities. Management of working capital, therefore, includes management of all current assets and current liabilities.

The apparatus, which the businessman uses in carrying on his business, has two main and distinct wings. One of the wings consists of establishment such as land, building, plant, equipments, accessories, tools, production processes etc. popularly known as fixed assets. The other and equally important wing is to "funds" with which day-to-day business operations are carried out. Sophisticated machinery and state of the art techniques might be made available by the businessman for manufacturing the product, but it is the amount of "funds" which are employed in day-to-day carrying on the business and the efficiency with which these are employed, determine to a great extent the financial results of the business enterprise.

Funds are utilised in day-to-day business in the form of debtors, stocks, bills receivables, cash and bank balances and readily realiable investments etc. These are popularly called "current assets". It is with these funds that the day-to-day working of the business is carried on. These assets are, therefore, known as "Working Capital".

Thus working capital refers to the investment by a business in its short-term assets like inventories, accounts receivable, marketable securities. Net current assets or net working capital represents the current assets less current liabilities. Hence, management of working capital involves management of all current assets and current liabilities.

1.2 CONCEPTS OF WORKING CAPITAL

There are two concepts regarding the meaning of working capital. According to one School of thought (supported by distinguished authorities like Lincoln, Doris, Stevens and Saliers), Working capital is the excess of current assets over current liabilities, as reflected in the following equation:

Working Capital = Current Assets - Current Liabilities.

Net Working Capital refers to the difference between the current assets and current liabilities, i.e. the excess of current assets over current liabilities. The importance of this net working capital concept lies in that the business has to determine the amount and nature of the current assets to be used for meeting the commitment to current liabilities, as and when they become due for payment. Further, the amount needed in the business for operational purposes is the amount of current assets that remain after payment of liabilities.

According to the other School of thought (supported by authorities like Mead, Baker, Mallot and Field), Working Capital represents only the current capital assets or gross working capital. There is basis for both these contentions. To understand them, current conception of current assets and liabilities is essential. Current Assets are those assets that in the ordinary course of business can be or will be turned into cash within a short period(note exceeding one year, normally) without undergoing diminution of value and without disrupting the organisation. Examples of current assets are : (i) Cash in hand and at bank; (ii) Accounts receivable from customers (les reserve); (iii) Notes receivable from customers (les reserves); (iv) Inventories such as (a) Merchandise Inventory (of merchants), or (b) Raw Marketable work in progress, Finished goods (of manufacture); (vii) Marketable securities held as temporary investment; (viii) Accured income.

Current liabilities are those liabilities intended at their inception to be paid in ordinary course of business within a reasonable short time (normally within a year) out of the current assets or the income of the business. These are : (i) Accounts payable to creditors; (ii) Notes or Bills payable ; (iii) Accrued expenses such as accrued taxes, salaries and interest; (iv) Liability reserves of the nature of accrued expenses, such as a reserve for income taxes; (v) Bonds to be paid within one year, (vi) Dividends payable.

The arguments of the first School of thought with regard to working capital as the excess of current assets over current liabilities ae : (i) It is an established definition of working capital which is in use since long, (ii) This concept of working capital enables the shareholders to judge the financial soundness of the concern and the extent of protection afforded to them. It is because with an increase in short-term borrowings the working

capital does not increase. (iii) Any concern with an excess over current liabilities can successfully tide ove periods of emergency e.g. depression (iv) Further there is no obligation on the part of the company to return the amount invested by the shareholders or creditors. (v) Such a definition is of great practical value in ascertaining the true financial position of companies having current assets of similar amount.

1.3 IMPORTANCE OF WORKING CAPITAL

Proper and efficient management of working capital is very important for the success of an enterprise. It aims at protecting the purchasing power of assets and maximising the return on investment. The manager of administration of current assets to a very large extent determines the success of operations of a firm. Constant management is required to maintain appropriae levels in the various working capital accounts. Cash and financial bodget aid in establishing proper proportions. Sales expansion, dividend declaration, plant expansion, new product line, increased salaries and wages, rising price levels etc. put added burdern on working capital maintenance. Failure of business is undoubtedly due to poor management and absence of management skill. Shortage of working capital, so often advanced as the main cause of failure of industrial concerns, is nothing but the clearest evidence of mismanagement which is so common.

In fact the major portion of the financial manager's time is spent in the management of working capital. Current assets account for a very large portion of the total investment of a firm. In some of the industries, current assets on an average represents over three fourths of the total assets. In the case of trading concerns, these account for about 80% of the total investment.

The relationship between sales growth and current assets is close and direct. A firm may, sometimes, be able to reduce the investment in fixed assets by renting or leasing plant and machinery. But it can not avoid investment in cash, accounts receivable and inventory. The management of working capital also helps the management in evaluating various existing or proposed financial constraints and financial offerings. All these factors clearly indicate the importance of working capital management in a firm.

1.4 FACTORS AFFECTING THE AMOUNT OF WORKING CAPITAL

The Level of working capital requirement is influenced by a number of factors which are discussed below:

(i) General nature and type of business.
(ii) Size of business,
(iii) Production cycle and cost of product,
(iv) Volume of sales,
(v) Terms of purchase and sales
(vi) Turnover of inventories,
(vii) Turnover of debtors
(viii) Period required to cover a business cycle,
(ix) Market conditions,
(x) Uniform and seasonal nature of sales,
(xi) Credit rating of the company.

The concept of working capital as current assets les current liabilities does not indicate the magnitude of working capital of a particular industrial or trading concern. As mentioned above, the working capital requirements depend upon a variety of factors. For instance, if the turnover of company A which manufactures machinery is Rs.30,00,000 per annum, it might require working capital of say Rs.10,00,000 while company B, which carries on business as a wholesale distributor of milk powder, may require Rs.2,00,000 as working capital for the same turnover of Rs.30,00,000. Therefore a discussion of the factors affecting the size of working capital should be appropriate at this point.

(i) General nature and type of business

The working capital requirements of a manufacturing company are relatively larger than those of a retail trader or reseller. Industrial unit manufacturing capital goods will require more working capital than the one producing consumer goods since the cycle of a business manufacturing capital goods is longer than that of consumer goods industry. But at the same time, capital goods industry which can secure the sizeable amount

as advance against order for the product might need less working capital than the consumer goods industry which has to supply goods at any three or months' credit.

Working capital requirements of seasonal business vary considerably with peak season requirements being larger than those for a lean season. In case of a business dealing in perishable goods it is difficult to carry large stocks, and hence working capital required would be comparatively small.

Working capital requirements thus depend upon the nature of the business.

(ii) Size of business:

The size of business also affects its working capital requirements. The larger the scale of operations the greater is the amount of working capital.

(iii) Production cycle and cost of product:

The time taken to convert raw materials into finished stock is known as the production cycle. The longer the production cycle and the greater the cost of product the larger is the inventory tied up in its manufacture. A company engaged in turning out a product which involves any aging process like a distillery, must make a particularly heavy investment in inventory. On the other hand, one engaged in bakery sells the bulk of its output daily and therefore, it is turned over far more rapidly.

(iv) Volume of Sales :

Volume of sales is directly related to working capital requirements. An industrial unit producing and selling 30 TV sets in a day will require more working capital than the one producing and selling only 10 TV sets in a day, obviously because of larger working capital in financing the raw materials and operating costs. Although to some extent the requirements of working capital may be reduced by more efficient bulk buying getting more discounts on purchases, yet by and large, working capital requirements vary directly with the volume of sales.

(v) Terms of purchases and sales :

Working capital requirements are affected by the terms of purchase and sale. Sometimes purchases may be self-financing. Businessman may purchase goods on credit, say 50 or 80 days' credit. It assumed that the operating cycle is of 40 days' duration.

The finished goods produced may be sold on cash basis. Under such circumstances, working capital requirements for purchases would be quite small.

But when goods are bought on cash payment, larger amount will be necessary to finance the inventory. Sometimes, supply of materials is irregular and this necessitates making purchases as and when materials are available, even on unfavorable terms. Such a situation involves larger outlay of working capital.

(vi) Turnover of inventories:

The ratio of annual sales to working capital or any component thereof determines the number of times current assets are converted back into cash during a year. The higher the rate of turnover, larger is the volume of business transactions which can be conducted with a given amount of such current assets. For inventories, the higher the rate of turnover the lesser the risk of loss due to changes in demand, style changes and price declines.

(vii) Turnover of debtors:

If a businessman has a monthly turnover of Rs. 2 lakhs and allows 60 days' credit facilities, he would need investment of Rs. 4 lakhs to finance the debtors. If he allows 90 days' credit he would require Rs.6 lakhs of finance the debtors. The longer the credit terms, the larger would be the finance the required. Thus, the working capital requirements depend upon the span of time necessary to collect receivables into cash. The shorter the time required to collect receivables, the lower is the amount of necessary working capital High inventory turnover alongwith efficient collection from debtors will keep the working capital requirements to the minimum.

(viii) Period required to cover a business cycle:

Business cycles affect the working capital requirements. In the periods of prosperity, business activity expands. Such expansion leads to purchasing goods in advance of current needs to secure the advantages of lower prices and to meet the possible increases in demand. This requires larger capital outplays. On the other hand, I periods of depression when business activity is reduced, there is a tendency to buy less and use the stocks already

accumulated and to recover the receivables. However actual requirements of working capital is largely influenced by the period required to cover a business cycle.

(ix) Market conditions:

The quantity of stocks to be maintained is also determined by the availability of materials and the time taken to make the goods available. Fluctuation in market prices discourage the businessman to keep large inventories due to the risk of possible loss. However, in the case of very risky business, large amount of cash is sometimes kept by way of temporary investments to meet the possible loss and to save the company's credit.

(x) Uniform and seasonal nature of sales:

When sales are steady and uniform almost the same amount of working capital would be needed throughout the year. However, if the sales are seasonal, large working capital would be required during peak season and small one during the lean period.

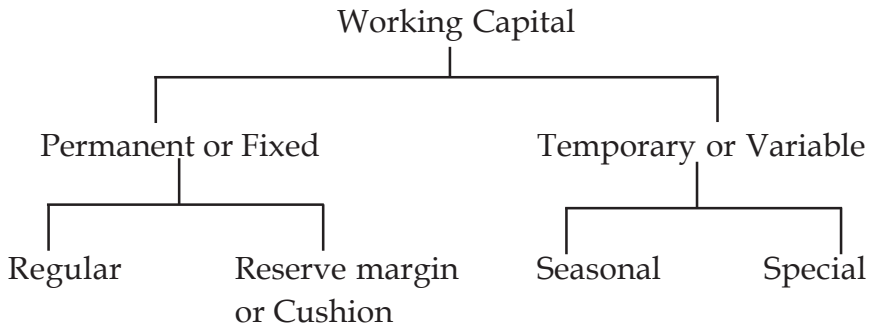
(xi) Credit Rating of the Company:

The sizes of the working capital maintained by a company in the form of cash depends also upon the cash policy of the company while framing such a policy the time within which Debtors turnover and the practice of taking advantages of cash discount should be kept in mind.

Similarly, a company having a high credit rating enjoys the benefit of higher credit purchases. Consequently it requires a proportionately lesser amount of working capital and vice versa.

1.5 CLASSIFICATION OF WORKING CAPITAL

Generally speaking, the amount of funds required for operating needs varies from time to time in every business. But a certain amount of assets in the form of working capital are always required, if a business has to carry out its functions efficiently and without a break. These two types of requirements - permanent and variable are the basis for a convenient classification of working capital as follows:



(i) Permanent of fixed working capital : It is that part of the capital which is permanently locked up in the circulation of current asset and in keeping it moving. For instance, every manufacturing concern has to maintain stock of raw materials, work-in-progress, finished products, loose tools and equipment. It also requires money for the payment of wages and salaries throughout the year.

The permanent or fixed working capital can again be sub-divided into (a) Regular Working Capital and (b) Reserve margin or cushion working capital. Regular Working Capital is the minimum amount of liquid capital needed to keep up the circulation of the capital from cash to inventories, to receivables and back again to cash.

This would include a sufficient cash balance in the bank to discount all bills, maintain an adequate supply of raw materials for processing, carry a sufficient stock of finished goods to give prompt delivery and effect the lowest manufacturing costs, and enough cash to carry the necessary accounts receivables for the type of business engaged in.

Reserve margin or cushion working capital is the excess over the need for regular working capital that should be provided for contingencies that arise at unstated periods. The contingencies comprise (a) rising prices, which may make it necessary to have more money to carry inventories and receivables, or may make it advisable to increase inventories; (b) business depressions, which may raise the amount of cash required to ride out usually stagnant periods; (c) strikes, fires and unexpectedly severe competition, which use up extra supplies of cash; and (d) special operations, such as experiments with products or with method of distribution, war contracts, contracts to supply new businesses, and the like which can be undertaken only if sufficient funds are available, and which in many cases mean the survival of a business.

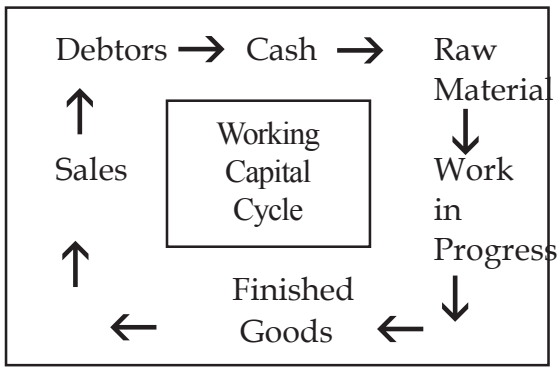
(ii) Variable working capital : The variable working capital changes with the volume of business. It may be sub-divided into (a) seasonal and (b) special working capital. In may lines of business (e.g. Gur or Khandsari making and Fur industry operations are highly seasonal and, as a result, working capital requirements vary significantly during the year.

The capital required to meet the seasonal needs of industry is termed as Seasonal Working Capital. On the other hand, Special Working Capital is that part of the variable working capital which is required for financing special operations, such as the launching of extensive marketing campaigns experiments with products or with methods of distribution, carrying out of special jobs and similar other operations that are outside the usual business of buying, fabricating and selling.

This distinction between permanent and variable working capital is of great significance particularly in arranging the finance for an enterprise. Regular of fixed working capital should be raised in the same way as fixed capital is procured, through a permanent investment of the owner or through long-term borrowing. As business expands, this regular capital will necessarily expand. If the cash returning from sales includes a large enough profit to take care of expanding operations and growing inventories, the necessary additional working capital may be provided by the earned surplus of the business. Variable needs can, however, be financed out of short-term borrowings from the Bank or from public in the form of deposit.

1.6 WORKING CAPITAL CYCLE

The working capital cycle refers to the period that a business enterprise takes in converting cash back into cash. For example, a manufacturing firm uses cash to acquire inventory of raw materials that is converted into semi finished goods or work-in-progress and then into finished goods. When finished goods are disposed of to customers on credit, account receivable are generated. When cash is collected from customers, they again have cash. At this stage one operating cycle is completed. Thus a circle from cash back to cash is called the "working capital cycle". The following diagram will illustrate the several current assets forming the working capital cycle.



Thus a working capital cycle, generally, has the following four distinct stages:

(i) The raw materials and stores inventory stage;

(ii) The semi-finished goods or work-in-progress stage;

(iii) The finished goods inventory stage; and

(iv) The accounts receivable or book debts stage.

Each of the above working capital cycle stage is expressed in terms of number of days of relevant activity and requires a level of investment to support it . The sum total of these stage-wise investments will be the total amount of working capital of the firm.

The following formula may be used to express the framework of the operating or working capital cycle:

$$T = (r - c) + w + F + b$$

Where, 't' stands for the total period of the working capital cycle in number of days;

'r' stands for the number of days of raw material and stores consumption requirements held in raw materials and stores inventory;

'c' the number of days of purchase in trade creditors'

'w' the number of days of cost of production held in work-in-progress;

'f' the number of days of cost of sales held in finished goods inventory; and

'b' the number of days of sales in book debts.

The computations may be made as under:

$$'r' = \frac{\text{Average inventory of raw materials and stores}}{\text{Average per day consumption of raw materials stores}}$$

$$'c' = \frac{\text{Average trade creditors}}{\text{Average credit purchases per day}}$$

$$'w' = \frac{\text{Average work-in-progress}}{\text{Average cost of production per day}}$$

$$'f' = \frac{\text{Average inventory of finished goods}}{\text{Average cost of sales per day}}$$

$$'b' = \frac{\text{Average book debts}}{\text{Average sales per day}}$$

The average inventory, trade creditors, work-in-progress, finished goods and book debts can be computed by adding the opening and closing balances at the end of the year in the respective accounts and dividing the same by two. The average per day figures can be obtained by dividing the concerned annual figures by 365 or the number of days in the given period.

1.7 POINTS TO REMEMBER

Working capital indicates the investment by a company in short-term assets such as cash, marketable securities, accounts receivable and inventories.

Working capital is the excess of current assets over current liabilities, as reflected in the following equation:

Working capital = Current Assets - Current liabilities.

Proper and efficient management of working capital is very important for the success of an enterprise. It aims at protecting the purchasing power of assets and maximizing the return on

investment. Constant management is required to maintain appropriate levels in the various working capital accounts.

Permanent or fixed working capital is that part of the capital which is permanently locked up in the circulation of current assets and in keeping it moving.

The variable working capital changes with the volume of business. It may be sub divided into (a) seasonal working capital and (b) special working capital.

The following formula may be used to express the framework of the operating cycle or working capital cycle :

$T = (r - e) + w + f + b$

The working capital cycle, generally, has the following four distinct stages:

(i) The raw materials and stores inventory stage;
(ii) The semi-finished goods or work-in-progress stage.
(iii) The finished goods inventory stage; and
(iv) The accounts receivable or book debts stage.

1.8 KEY WORDS

Gross Working Capital :

The term Gross Working Capital represents only the current assets and refers to the total amount of investments made in the current capital assets by a business unit.

Net Working Capital :

This term refers to the difference between the current assets and current liabilities, i.e. the excess of current assets over current liabilities. In other words, the term net working capital represents the total investments made in the current assets through finance provided by the proprietors owners and long-term borrowings.

Working Capital Cycle :

The term working capital cycle refers to the period that a business enterprise takes in converting cash back into cash after

completing one production cycle. Thus a circle from introducing cash back to cash is called the working capital cycle.

1.9 SELF ASSESSMENT QUESTIONS

1. What do you understand by working capital? How is working capital determined in cash of a business enterprise?
2. Explain the concept of working capital. Discuss the importance of working capital in a business or industrial concern.
3. Narrate the different factors that affect the amount of working capital.
4. Describe the different determinants of the amount of working capital requirement in cash of an industrial enterprise.
5. Elucidate the terms "Gross Working Capital" and "Net Working Capital". Differentiate between the two.
6. What are the advantages of having adequate working capital?
7. Discuss about the classification of working capital. Distinguish between permanent working capital and temporary working capital.
8. What is "Working capital cycle"? Is it feasible to minimize the working capital requirement of a firm by minimizing the period of the cycle? If so, describe how this can be done?

1.10 FURTHER READING

Banerjee, B., "Financial Policy and Management Accounting", The World Press Private Ltd. Kolkata.

Block - 5

Unit - 2

PROJECTION OF WORKING CAPITAL REQUIREMENTS - IN CASE OF TRADING ORGANISATION - IN CASE OF MANUFACTURING ORGANISATION

Structure

2.0 OBJECTIVES

After going through this unit, you should be able to :

- Estimate the working capital requirements in case of trading concerns.
- Estimate the working capital requirements in case of manufacturing concerns.

2.1 ESTIMATING WORKING CAPITAL REQUIREMENT: TRADING ORGANISATION

In case of trading concern, if the Balance Sheet of the previous accounting year is available and the volume of business for the budget period can be estimated, then the estimated working capital requirement can be determined easily. Here the efforts that have to be made is to adjust the items of current assets and liabilities in relation to the volume of business and deduct the aggregate value of adjusted current liabilities from the aggregate value of the adjusted current assets.

If the figures of current assets and current liabilities relating to the previous accounting period are not available for any reason viz. in sufficient information, new concern etc. then the preparation of working capital budget becomes comparatively difficult. In such a case, the items of current assets and liabilities for current or budget period should be determined first on the basis of a given volume, the difference between current assets and current liabilities would then give the estimated working capital requirement.

2.2 ILLUSTRATIONS -- TRADING CONCERN

Illustration - 1 :

The following is the Balance Sheet of the ABC Ltd., as on 31.12.2005. The company seeks to expand its activities. It has estimated that would be able to increase the sales by 25%. You are required to forcast the working capital required after the expansion.

BALANCE SHEET

As at 31st December, 2005

		Rs.	Rs.
Fixed Assets (at cost)	...	2,68,00	
Less : Depreciation	...	48,000	
			2,20,000
Current Assets :			
Stock in trade	...	4,08,000	
Sundry Debtors	...	4,80,000	
Bank Balance	...	16,000	
			9,04,000
Less : Current Liabilities:			
Trade Creditors	...	3,68,000	
Bank Overdraft	...	2,20,000	
Taxation	...	80,000	
Outstanding Expenses	...	36,000	
			7,04,000
			2,00,000
		Total Assets	4,20,000
Represented by :			
Equity Share Capital	...	3,00,000	
Reserves	...	1,20,000	
			4,20,000

The following further information is furnished:

1. It is decided to limit the Bank Overdraft to Rs.1,60,000.
2. Increase in creditors, stocks and debtors is expected to be proportionate.,
3. Rates of taxation will remain the same. The profit is expected to be Rs.4,00,000 as against Rs.2,00,000 prior to expansion.
4. It is decided to maintain minimum banks balance of Rs.30,000.

Solution:

Statement of Estimated Working Capital Required

	Rs.	Rs.
Current Assets :		
Stock-in-trade (Note 1)	5,10,000	
Sundry Debtors (Note 2)	6,00,000	
Bank Balance (Note 3)	30,000	
		11,40,000

Less : Current Liabilities:		
Trade Creditors (Note 4)	4,60,000	
Bank Overdraft (Note 5)	1,60,000	
Taxation (Note 6)	1,60,000	
Outstanding Expenses (Note 7)	45,000	
		8,25,000
Net Working Capital Forcast	…	3,15,000
Present Working Capital	…	2,00,000
Additional Working Capital Required		1,15,000

Working Note

Note 1 :	**Rs.**
Stock as on 31.12.05	4,08,000
25% increase	1,02,000
	5,10,000
Note 2 :	
Sundry Debtors as an 31.12.2005	4,80,000
25% increase	1,20,000
	6,00,000
Note 3:	
Minimum Bank Balance required to be maintained	30,000
Note 4 :	
Trade Creditors as on 31.12.05	3,68,000
25% increase	92,000
	4,60,000

Note 5:

Bank Overdraft limited to Rs.1,60,000

Note 6:

Taxation will be twice the previous amount as the profit will increase by 100%

Note 7:	
Outstanding Expenses as on 31.12.05	36,000
25% increase	9,000
	45,000

Illustrtion - 2 :

The Wonderful Industries Ltd. are engaged in large-scale retailing. From the following information, you are required to forcast their working capital requirements.

Projected annual sales	...	Rs.65,00,000
Percentage of Net Profit on cost of sales		25%
Average credit period allowed to Debtors		10 weeks
Average stock carrying (in terms of sale requirements)		8 weeks
Average credit period allowed by Creditors		4 weeks
Add 10% to computed figures to allows for contingencies		

Solution :

		Rs.
Projected Annual sales	...	65,00,000
Net Profit @20% on sales or 25% on cost of sales		13,00,000
Cost of sales per annum	...	52,00,000
Cost of sales per week (Rs. 52,00,000 / 52 weeks)	...	1,00,000

Statement of Working Capital Requirement

		Selling Price Basis (Rs. in lakhs)	Cost Price Basis (Rs. in lakhs)
Current Assets :			
Stock (Rs.1,00,000 x 8)	..	8.00	8.00
Debtors:			
At cost equivalent			
Rs.1,00,000 x 10 = 10.00			10.00
Profit : (13 lakhs / 52 weeks) x 10 weeks = 2.50		12.50	
		20.50	18.00
Less : Current Liabilities:			
Creditors (Rs.1 lakhs x 4)		4.00	4.00
Working Capital computed		16.50	14.00
Add : 10% for contingencies		1.65	1.40
Net Working Capital Required		**18.15**	**15.40**

Note : It has assumed that the creditors include those for both goods and expenses and that all such creditors allow one month credit on an average.

Interpretation of Results:

The amount of Rs.15.4 lakhs (Rs.18.15 lakhs) found above is to be interpreted as the amount to be blocked in inventory, debtors (minus creditors) at any time during the year in quesiton, in order that the anticipated activity (Primarily sales) can go on smoothly.

The amount is not for a period of time but at any point of time. It represents the maximum or the highest quantum of locking up at any time during the period.

Illustration - 3 :

The following working capital statement as on 31.03.2006 is submitted to you:

Statement of Net Working Capital

(As on 31.03.2006)

		Rs.	Rs.
Current Assets :			
Stock in Trade:			
Item A	...	36,000	
Item B	...	84,000	
Item C	...	42,000	
			1,62,000
Sundry Debtors:			
More than 6 months old		24,000	
Others	...	68,000	
			92,000
Cash and Bank Balance		22,000	
			2,76,000
Current Liabilities :			
Bank Overdraft (Stocks)	...	97,200	
Bank Overdraft (Debtors)	...	50,400	
Sundry Creditors	...	40,000	
Provision for Taxation	...	35,000	
			2,22,600
Net Working Capital ...			**53,400**

The following additional information are also furnished.

1. The company has decided to improve the business. This will increase the sales by 20%.
2. Stocks re likely to increase by 20% over the proportionate increase resulting from expanded activity. It is estimated that stock of items of A, B and C will be in the ratio of 1:2:1.
3. There will be a change in credit policy resulting in average reduction of debtors by 15%. It is estimated that 30% of debtors will remain outstanding for more than 6 months.
4. Liabilities will increase in proportion to increase in business activity.
5. Rate of taxation will remain the same but surcharge of 10% of the tax payable is levied.
6. Due to increased activity, the profit is likely to go up by 20%.
7. Bank has sanctioned overdraft facilities as under:

(a) Against Stock	...	80% of cost item - A 60% of cost of item - B 40% of cost of item - C
(b) Against Debtors	...	40% against Debtors of more than 6 months old. 60% against other Debtors.

8. Bank Balance to remain at Rs.15,000.

Solution:

Working Notes

Current Assets Requirements:

1. Stock-in-trade :

	Rs.
Present Stock	1,62,000
20% increase due to increased activity	32,400
	1,94,400
Further 20% increase due to change in stock policy	38,880
Total stock Required	2,33,280

2. Sundry Debtors:

	Rs.
More than 6 months old	24,000
Other	68,000
Add: 20 % for increased	92,000
Activity	18,400
	1,10,400
Less : 15% reduction due to change in credit policy	16,560
Debtors	93,840

3. Sundry Creditors:

Present Balance	...	40,000
Add : 20% increase	...	8,000
		48,000

4. Provision for Taxation:

Present Provision	...	35,000
Profits would rise by 20% hence taxation would also be increase by 20%		7,000
		42,000
Add : New Levy of 10% Surcharge		4,200
		46,200

5. Bank Overdraft:

(a) Stock estimated at Rs.2,33,280.

Proportionate stock of each item.		Rs.			Bank Overdraft (stock) Rs.
Item A	..	58,320	80%	...	46,656
B	...	1,16,640	60%	...	69,984
C	...	58,320	40%	...	23,328
		2,33,280			1,39,968

(b) Debtors : **Bank Overdraft (Debtors)**

	Rs.	P.C.	Rs.
More than 6 months old :			
30% of Rs.93,840	28,152	40%	11,260
Others :			
70% of Rs.93,840	65,688	60%	39,413
	93,840		50,673

Statement of Working Capital forecast

Current Assets :

Stock-in-trade		Rs.	Rs.	Rs.
Item A	...	58,320		
Item B	...	1,16,640		
Item C	...	58,320		
			2,33,280	

Sundry Debtors			
More than 6 months old ...	28,152		
Others	65,688		
	93,840		
Bank Balance ...	15,000		
Total Current Assets			**3,42,120**
Less : Current Liabilities:			
Bank Overdraft (stock) ...	1,39,968		
Bank Overdraft (Debtors) ...	50,673		
	1,90,641		
Creditors ...	48,000		
Provision for Taxation	46,200		
		2,84,841	
Net Working Capital		57,279	
Less : Present Working Capital		53,400	
Additional Working Capital required		**3,879**	

2.3 ESTIMATING WORKING CAPITAL REQUIREMENT : MANUFACTURING CONCERN

The steps involved in estimating the working capital requirement of a manufacturing concern can be explained as follows:

1. Determine the average production in terms of days, week or month as the case may be.
2. Ascertain the average cost (daily, weekly or monthly as required) of each element of cost viz. material, labour and overheads.
3. Determine the "Operating Cycle" or the "net block period" for each element of cost (For example, materials may be purchased in week1, paid in week 3, stored until week 4, included in a product in the process of production in week 5, stored again before sales in week 6, despatched to customers in week 7 and paid for by the customer in week 10. The net block period here is 10 - 3 = 7 weeks (i.e. the period during which cash remains blocked).

4. Multiply (2) by (3) to determine the working capital requirement for each element of cost. For example, if the average weekly cost of raw mateials is Rs.10,000 and the 'net block period' for the element is, say, 4 weeks, the average working capital requirement for materials is Rs.10,000 x 4 = Rs.40,000.

5. Add together all the amount obtained in (4) plus cash float, if any, that it is deemed desirable to hold. This gives the total amount required to finance the working capital.

Very often another amount is allowed to meet the contingencies e.g. 5% of 10% of the total amount involved may be added to cover the contingencies. This is expected to over uncertainties or contingencies.

It emerges from the ealier discussion that the following information are necessary for preparation of a Working Capital Forcast to sustain a given volume of activity.

1. The expected annual production.
2. The cost of raw materials, wages and overheads per unit of the product.
3. The period within which raw materials will remain in store before issue to production shops.
4. The processing or conversion time.
5. The period of storage of finished goods before sale.
6. The terms of credit to debtors, credit from suppliers of materials and supplies, time-lag in wage payment etc.

2.4 ILLUSTRATIONS : MANUFACTURING CONCERN

Illustration - 1

M/S B. & Co. requests you to prepare a statement showing the working capital requirements. They estimate to produce 4,800 units in a year. The following information have been furnished for you.

Elements of cost		**Cost per unit**
		Rs.
Raw Materials	...	8
Direct Labour	...	2
Overheads	...	6
Total Cost		16
Profit	...	4
Selling Price	...	20

Raw materials are in stock on an average period of one month. Materials remain in process on an average period of half a month. Finished goods are in stock on an average period of one and a half months. Customers enjoy one month's credit while suppliers allow one month's credit.

Cash in hand expected in Rs.2,500.

You are further informed that production is carried out uniformly during the year and wages & overheads accrue evenly.

Solution:			**Rs.**
Annual sales	...	4,800 units :	96,000
Monthly Sales	...	400 units :	8,000

Monthly cost of 400 units :		**Rs.**
Raw Materials (400 x 8)	..	3,200
Direct Labour (400 x 2)	..	800
Overheads (400 x 6)	..	2,400
Total		**6,400**

Statement showing Estimate of Working Capital

A. Current Assets :

(a) Stock-in-trade		**Rs.**
(i)	Raw material (one month's stock)	3,200
(ii)	Work-in-progress:	
	One month's expenditure Rs.6,400	
	Half month's expenditure	3,200

(iii)	Finished Goods:		
	One and half month's stock		
	Cost per month ...	Rs.6,400	
	Cost for $1^1/_2$ months		9,600
			16,000
(b) Debtors :			
	1 month's sales remains outstanding		
	Units x Selling Price (400 x 2) ...		8,000
(c) Cash in hand ...			2,500
			26,500
B. Less : Current Liabilities:			
As the business enjoys one month's			
Credit from suppliers, amount equal to the cost of one month's			
consumption of Raw Materials remains payable to suppliers			3,200
Estimated Working Capital ...			23,300

Illustration - 2:

A manufacturing concern undertakes the manufacture of toys. The following are the cost data per unit of toys.

Elements of cost		Cost per Unit
		Rs.
Materials	...	4
Direct Labour	...	2
Overheads	...	2
Total Cost	...	8
Profit		2
Selling Price	**...**	**10**

The manufacturing concern has budgeted a sale of Rs.2,60,000 per annum. The following additional data have also been furnished.

1. The production process takes 3 (three) weeks.
2. The concern carries stock of raw materials equal to 3 weeks' consumption and finished goods equal to 2 weeks' production.

3. The enterprise allows credit for 5 weeks to customers and receives credit of 4 weeks from suppliers.

4. It is assumed that the production and overheads accure uniformly throughout the year.

5. The enterprise maintains Bank Balance at Rs.5,000.

You are required to estimate the working capital requirement of the manufacturing concern, from the information provided.

Solution:

Budgeted Sales ...	...	Rs. 2,60,000
Selling Price per unit	...	Rs. 10
Therefore production per annum		26,000 units
Production per week	...	500 units

$$\frac{(26{,}000}{52}$$

1. Stock-in-trade:

A. Raw Materials :

(Units per week x Cost per unit x No. of weeks stock) or (500 x 4 x 3)

.... Rs. 6,000

B. Work-in-progress:

Production process takes 3 weeks

(i) Raw Materials for 3 weeks	6,000
(ii) Labour for 3 weeks :	
(Units per week x labour charge per unit x Time lag during production) or (500 x 2 x 3)	3,000
(iii) Overheads:	
(Units per week x cost of overhead per unit x Time lag during production) or (500 x 2 x 3)	3,000
	12,000

C. Finished Goods :

Cost per unit ... Rs.8

Finished Goods in stock = 2 weeks' production

(weekly production x No. of weeks production in stock x cost per unit)

or (500 x 2 x 8) ... 8,000

2. Debtors :

Sales price per week = (Units sold x Sale price per unit) or

(500 x 10) = 5,000

Debtors = (Credit period x Sales per week) or (5 x 5,000) ... 25,000

3. Creditors:

Value of Supplies per week (Raw Materials in units x Unit cost of Raw Materials)

or (500 x 4) .... Rs. 2,000

Value of Supplies for 4 weeks' credit period (2,000 x 4) Rs. 8,000

Statement of Estimated Working Capital

	Rs.	Rs.	Rs.
Current Assets :			
Stock-in-trade:			
Raw Materials	6,000		
work-in-progress	12,000		
Finished goods	8,000		
		26,000	
Debtors		25,000	
Bank Balance ...	...	5,000	
			56,000
Less : Current Liabilities:			
Creditors ...			8,000
Estimated Working Capital Required			48,000

Illustration - 3

The Modern Engineering Works which manufactures watches, furnishes you with the following data with the request to you to give the estimate of the working capital required by the concern:

1. The monthly production is 200 watches.
2. The sale price is Rs. 500 per watch.
3. The break-up of cost of a watch is as under:
   (i) Raw Materials .. 50% of the selling price.
   (ii) Labour 15% of the selling price.
   (iii) Overheads 25% of the selling price.

On studying the production process, it is found that :

(i) Each watch remains in process for about one month.

(ii) Raw materials are fed immediately at a time.

(iii) Labour and overheads are paid evenly during the month.

(iv) One month's raw materials remain in stock.

(v) The firm carries three month's production as the finished goods stock.

(vi) The debtors are allowed credit for one month and suppliers allow credit for two months.

There is a regular production and sales cycle. The company normally keeps the cash at Rs.20,000.

Solution:

1. Raw Materials:

Monthly production	= 200 units
Sales price of 200 unit	
@ Rs. 500 each	= Rs.1,00,000
Raw Materials cost,	
50% of sale price	= Rs.50,000

2. Work-in-Progress:

(one month's cost is taken as value of work-in-progress because production cycle takes one month) Rs.

(i) Raw Materials cost of one month ... 50,000

(ii) Labour

(Cost of 1 month is 15% of selling price,

i.e. 15% of Rs.1,00,000 As this cost is evenly

incurred throughout the month, 1 month's cost is Rs.15,000)	. . .	15,000
(iii) Overheads		
(Cost of 1 month is 25% of selling price = Rs.25,000)...		25,000
		90,000

3. Finished Goods :

As the firm carries finished goods inventory of 3 months' production, the cost of finished goods inventory:

Production cost per month :		Rs.	
Raw Materials	...	50,000	
Labour	...	15,000	
Overheads		25,000	
		90,000	
∴ 3 months' cost (3x 90,000)			2,70,000

4. Stock-in-trade:

Raw Materials	...	50,000	
Work-in-progress	...	90,000	
Finished Goods	...	2,70,000	
		...	4,10,000

5. Debtors:

As the credit period allowed to Debtors is one months, sale equal to 1 month (Rs.500 x 200 units) ...	1,00,000
6. Bank Balance (as given)	20,000

7. Liabilities:

Creditors for goods:

2 month's credit is allowed by suppliers. Therefore, 2 months' Raw Materials cost would remain unpaid (2 x 40,000)	...	1,00,000

Statement showing Estimate of Working Capital

Current Assets :		**Rs.**	**Rs.**
Stock-in-trade:			
Raw Materials	...	50,000	
Work-in-progress	...	90,000	
Finished Goods	...	2,70,000	
			4,10,000
Debtors ..	..		1,00,000
Bank Balance ...	...		20,000
			5,30,000
Less : Current Liabilities:			
Creditors			1,00,000
Estimated Working Capital		...	4,30,000

2.5 POINTS TO REMBMER

The steps involved in estimating the working capital requirement of a manufacturing concern are as follows:

1. Determine the daily / weekly / monthly average production.
2. Determine the daily / weekly / monthly average cost of each element of cost viz. material, labour and overheads.
3. Ascertain the 'operating cycle' or the 'net block period' for each element of cost.
4. Multiply (2) by (3) to determine the working capital requirement for each element of cost.
5. Add together all the amounts obtained in (4) plus cash float, if any, that it is deemed desirable to hold. This gives the total amount required to finance the working capital.

   Thereafter very often another amount is allowed to meet the contingencies e.g. 5% or 10% of the total amount involved may be added to cover the contingencies. This is expected to cover uncertainties or contingencies.

2.6 KEY WORDS

Adjusted Current Assets : All the figures of each current assets are revised according to anticipated changes that may take place in terms of volume, cost etc. Finally the revised figure of the current asset is obtained. This is called adjusted current asset.

Adjusted Current Liabilities: All the figures of each current liability are revised according to the anticipated changes that are likely to happen in terms of volume, cost, time etc. Accordingly, the revised figure of each current liability is determined. This revised current liability is known as adjusted current liability.

Operating Cycle: It is also known as 'net block period'. It refers to the period that a business enterprise takes in converting cash back into cash after completing one production cycle.

2.7 SELF-ASSESSMENT QUESTIONS

1. Describe the procedure of estimating working capital requirement in case of trading organisation.
2. Explain the steps that are involved in estimating the working capital requirement in case of a manufacturing concern.
3. Discuss about the information which are necessary for preparation of a statement of working capital forcast.
4. Write short notes on the following:
   (a) Adjusted Current Assets;
   (b) Adjusted Current Liabilities; and
   (c) Operating Cycle.

5. The following is the Balance Sheet of the Z. Co. Ltd. as on 31.12.2005. The company plans to expand its activities. It has also estimated that it will be able to increase the sales by 25%. You are required to forecast the working capital required after the expansion.

Balance Sheet

(As at 31.12.2006)

		Rs.	Rs.
Fixed Assets (at cost)		10,50,000	
Less : Depreciation		50,000	
			10,00,000
Current Assets :			
Stock-in-trade	...	4,00,000	
Sundary Debtors	...	3,00,000	
Bank Balance	...	50,000	
			7,50,000
Less : Current Liabilities:			
Trade Creditors	...	2,00,000	
Bank Overdraft	...	1,00,000	
Taxation	...	50,000	
Outstanding Expenses	...	10,000	
			3,60,000
Net Current Assets			**3,90,000**
Total Assets			**13,90,000**
Represented by :			
Equity Share Capital	...	10,00,000	
Reserves	...	3,90,000	
			13,90,000

The following additional information have been furnished:

1. It is decided to limit the bank overdraft to Rs.50,000
2. Increase in creditors, stocks and debtors is expected to be proportionate.
3. Rates of taxation will remain the same. The profit is expected to be Rs.50,00,000 as against Rs.2,50,000 prior to expansion.

4. It has decided to maintain minimum bank balance of Rs. 30,000.

5. B. Co. Ltd., is to manufacture a new product designed to sell at Rs.100 each. The annual output is estimated to be 8,000 units and no fluctuations in production are anticipated. The unit cost are as follows:

		Rs.
Materials	...	50
Labour	...	20
Overheads	...	10
		80

Materials are bought on one month's credit and stores equivalent to three months' issues will normally be on hand. The manufacturing cycle is two months and finished goods are in stock on an average for a further month. Customers are allowed two months for payment.

Assuming that there is no lag in payment of wages, that both wages and overheads, accrue evenly and that a cash float of Rs.10,000 will normally be held, ascertain the amount of working capital requirement.

7. You are required to prepare a statement showing the working capital needed to finance a level of activity of 6,00,000 units of output for the year. The cost structure for the company's product for the abovementioned activity level is detailed below:

Elements of cost		**Cost per unit**
		Rs.
Raw Materials	...	20
Direct Labour	...	10
Overheads	...	20
Total cost	...	50
Profit	...	10
Selling price	...	60

Raw materials are held in stock on an average period for two months. Work-in-progress will approximate to half-a-month's production. Finished goods remain in store on an average, for a month.

Suppliers of materials extend one month's credit. Two months' credit is normally allowed to debtors. A minimum cash balance of Rs.30,000 is expected to be maintained. The production pattern is assumed to be even during the year.

8. The capacity of an organisation is to produce 50,000 units of a product per annum. Due to frequent power cut, the organisation can operate at 60% of the capacity level. You are required to ascertain the working capital requirement at the current level of operations. The following information on the cost structure of the product, at the current level of production, is available;

Elements of cost		**Per Unit**
		Rs.
Raw Materials	...	12
Direct Labour	...	6
Overheads	...	8
Total cost	...	26
Profit		4
Selling Price		30

Raw materials are in stock, on an average, for 2 months. The duration of the production process is half-a-month. Finished goods are in stock, on an average, for 1 month. Credit allowed to customers is 3 months and that obtained from suppliers of raw materials is one and a half month. Lag in payment of wages is half a month. There is usually, no lag in payment of overheads.

2.8 FURTHER READING

Banerjee, B., "Financial Policy and Management Accounting" The World Press Private Ltd., Kolkata.

****