

COST AND MANAGEMENT ACCOUNTING

Second Year : B.B.A

SEMESTER – IV

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2nd Year B.B.A Semester – IV

COST AND MANAGEMENT ACCOUNTING

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FOREWORD

Since its establishment in 1976, Acharya Nagarjuna University has been forging ahead in the path of progress and dynamism, offering a variety of courses and research contributions. I am extremely happy that by gaining a 'A' Grade from the NAAC in the year 2014, the Acharya Nagarjuna University is offering educational opportunities at the UG, PG levels apart from research degrees to students from over 285 affiliated colleges spread over the two districts of Guntur and Prakasam.

The University has also started the Centre for Distance Education with the aim to bring higher education within reach of all. The centre will be a great help to those who cannot join in colleges, those who cannot afford the exorbitant fees as regular students, and even housewives desirous of pursuing higher studies. With the goal of bringing education in the door step of all such people. Acharya Nagarjuna University has started offering B.A, and B, Com courses at the Degree level and M.A, M.Com., L.L.M., courses at the PG level from the academic year 2021-22 on the basis of Semester system.

To facilitate easier understanding by students studying through the distance mode, these self-instruction materials have been prepared by eminent and experienced teachers. The lessons have been drafted with great care and expertise in the stipulated time by these teachers. Constructive ideas and scholarly suggestions are welcome from students and teachers invited respectively. Such ideas will be incorporated for the greater efficacy of this distance mode of education. For clarification of doubts and feedback, weekly classes and contact classes will be arranged at the UG and PG levels respectively.

It is aim that students getting higher education through the Centre for Distance Education should improve their qualification, have better employment opportunities and in turn facilitate the country's progress. It is my fond desire that in the years to come, the Centre for Distance Education will go from strength to strength in the form of new courses and by catering to larger number of people. My congratulations to all the Directors, Coordinators, Editors and Lesson -writers of the Centre who have helped in these endeavours.

Prof. P.Rajasekhar
Vice –Chancellor,
Acharya Nagarjuna University

B.B.A -SEMESTER – IV

405BBA21- COST & MANAGEMENT ACCOUNTING

Unit-I:Introduction:Management accounting- nature -scope-functions- Distinguish between Financial Accounting, Cost Accounting and management accounting - Cost Concepts and Classification.

Unit-II: Elements of Cost: Materials: Material control Selective control, ABC technique Methods of pricing issues FIFO, LIFO, Weighted average, (including problems). Labour: Control of labor costs time keeping and time booking Idle time Methods of remuneration labour incentives schemes

Unit-III: Financial statement Analysis: Financial Statements Need for analysis of Financial statements- comparative statements-commonsize statements- Trend analysis.

Unit IV: Ratio Analysis: Meaning – Accounting Ratios – uses – limitations – types of ratios – profit and loss account ratios – balance sheet ratios – mixed ratios.

Unit V: Costing Techniques: Marginal Costing –cost classification- differences between marginal costing and absorption costing – marginal cost equation- contribution- p/v ratio- margin of safety-BEP Analysis – (including problems).

Reference Books

Cost & Management Accounting : Kishore, R. M. 4th ed Taxman Allied Service

Principles & Practice Of Cost Accounting : Bhattacharyya, A. K. 3rd ed PHI

Management & Cost Accounting: Drury, Colin 6th ed Thompson Books

Cost Accounting: Managerial Emphasis: Horngren C. T/ Datar, S. M/ Foster, G. 12th ed Pearson

Dr. L. K. Jha ✓

MODEL QUESTION PAPER

(405BBA21)

B. B. A. Degree Examination

Second Year – Fourth Semester

Paper – IV : COST AND MANAGEMENT ACCOUNTING

Time : Three hours

Maximum Marks : 70

Section – A

Answer any FIVE of the following questions. (5 × 4 = 20 Marks)

1. Elements of cost.
2. Time rate method.
3. EBQ.
4. Trend analysis.
5. Profit volume ratio.
6. Job costing.
7. Cost sheet.
8. Inventory control.

SECTION – B

(5 x 10 = 50 Marks)

Answer ALL the following questions.

9. (a) Define cost accounting. Briefly explain the objectives and functions of cost accounting.

Or

- (b) Explain the nature and scope of Management accounting.

10. (a) From the following details write stores ledger under LIFO method.

2006 Dec.

1	Opening balance	100 kg @ Rs. 5.00
5	Received	50 kg @ Rs. 2.00
8	Issued	120 kg
10	Issued	10 kg
15	Received	80 kg @ Rs. 5.00
18	Issued	50 kg
20	Received	100 kg @ Rs. 4.00
25	Issued	40 kg
28	Issued	50 kg

Or

(b) Define labour turnover and how it was measured? Explain.

11. (a) Distinguish between Job costing and Batch costing.

Or

(b) Annual demand for a component is 30,000 with cost of set up per batch is Rs. 600.
Inventory carrying cost per unit per annum is Rs. 1.

(i) calculate the total cost assuming batch size of 4,000 units, 5,000 units, 6,000 units, 7,000 units, 9,000 units, 10,000 units also find the economic batch quantity.

(ii) using mathematical formula calculate economic batch quantity.

12. (a) Define financial statement analysis. Explain the objectives and powers financial statement analysis.

Or

(b) Briefly explain comparative analysis and common size analysis.

13. (a) Define Marginal costing. Explain the features and importance of Marginal costing.

Or

(b) From the following data, you are required to calculate

(i) P / V ratio

(ii) Break even sales with the help of P / V ratio

(iii) Sales required to earn a profit of Rs. 4, 50, 000

Fixed expenses Rs. 90,000

Variable cost per unit :

Direct material Rs. 5

Direct labour Rs. 2

Direct overheads = 100% of direct labour

Selling price per unit Rs. 12

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Chapter – 1

Scope and Significance of Cost Accounting

Objectives :

After going through this lesson we should be able to :

- Understand the meaning, definition and objectives of cost accounting
- Understand the advantages and limitations of cost accounting
- Discuss the installation of cost accounting system

Structure :

1.1 Introduction

1.2 Objectives of Cost Accounting

1.3 Advantages of Cost Accounting

1.4 Limitations of Cost Accounting

1.5 Installation of Cost Accounting System

1.6 Ideal System of Cost Accounting

1.7 Financial Accounting Vs. Cost Accounting

1.8 Questions

1.9 Suggested Readings

1.1 INTRODUCTION :

All aspects of accountancy have arisen from practical necessity. The oldest forms of accounting developed as a result of the need of commercial firms to present the resultant annual profit or loss. The emphasis of accounting is to know the profit or loss of a firm but not on other aspects like the profitability of a particular product or department; how much capital is locked up in unremunerative projects, how to control expenditure and reduce wastage etc. The main emphasis is on their ascertainment and exhibition fo

the profits earned or losses incurred by the business rather than on aspects of planning and control and decision making.

The cost of manufacture of products or of rendering a service is, no doubt, available in financial accounts for a division or enterprise as a whole and that too at the end of the accounting period. But if the cost of individual products or services and the profit or loss from each are required concurrently as the process of manufacture or of rendering the service proceeds, recourse has to be made to cost accounting. Cost Accounting developed as an advanced phase of accounting science trying to make up the deficiencies of financial accounts and is essentially a creation of the twentieth century. Let us know the meaning of Costing, Cost Accounting and Cost Accountancy.

Costing : Costing is the technique and process of ascertaining costs. It expresses faithfully the actual cost of any particular unit of production and also disclose how such total cost is constituted.

Cost Accounting : It is a normal mechanism by means of which costs of production and services are ascertained and controlled. It embraces all accounting procedures relating to recording of all income and expenditure and the preparation of periodical statements with a view to ascertain and control costs. Thus, it includes three things : Cost Ascertainment, Cost Presentation and Cost Control.

Cost Accountancy : It is the application of costing and cost accountancy principles methods and techniques to the science, art and practice of a cost accountant ascertainment of profitability. It is the science, art and practice of a Cost accountant.

1.1.1 Definitions :

Kohler in his dictionary for Accountants defines cost accounting as ``that branch of accounting dealing with the classification, recording, allocation, summarisation and reporting of current and prospective costs.

Mr. Wheldon defines cost accounting as ``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 values, and the ascertainment of profitability.”

1.1.2 Concepts used in Cost Accounting :

Costing : Costing is defined as “the technique and process of ascertaining costs of a given thing.” This term is not being used except with qualifying adjective. Ex. Marginal Costing.

According to CIMA, it is defined as “the establishment budgets, standard costs, and actual costs of operations, processes, activities, or a products; and the analysis of variances, profitability or the social use of funds.

Cost Accounting : Cost accounting is defined as the “Process of Accounting for cost from the point at which expenses is incurred or committed to the establishment of its ultimate relationship with cost centres and cost units.

Cost Accountancy : Cost Accountancy is defined 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.

1.2 OBJECTIVES OF COST ACCOUNTING :

Cost Accounting data provides in valuable help to the management in taking routine decisions in determining the total cost, per unit and periodic profit, valuation of inventory, in carrying out the functions of planning, budgeting, organising, formulating policies and controlling of costs and the like.

- 1. To ascertain the cost of product(s) or service(s) and to determine the selling price** : The main objective of cost accounting is to ascertain the total cost and cost per unit of different products manufactured and services rendered by an undertaking. The cost data provides the basis for the fixation of selling prices. Generally, competition determines the selling price. If the occasion demands, with the help of cost accounts, the management may quote prices even below total costs but above marginal costs, to increase sales.
- 2. To control costs** : Another important objective and advantage of cost accounting is control of costs. This may be achieved with the help of budgets and standards set up for the guidance of the management and also by elimination of all types of wastages, by efficient inventory control and by improving operative efficiency.

- 3. To provide basis for the management to formulate policies and to carry out its functions efficiently :** Cost Accounting is designed and developed primarily to guide, assist and serve the management. It assists the management in conducting the business activities with utmost efficiency. To sum up, in the words of Blocker : ``Cost Accounting is to serve management in the execution of policies and in the comparison of actual and estimated results, in order that the value of each policy may be appraised and changed to the future conditions.
4. To ascertain the profitable and unprofitable lines of activities.
 5. To find the causes that lead to profits/losses
 6. To provide basis for the preparation of budgets
 7. To provide a reliable basis for the preparation of tenders and estimates
 8. To reveal losses or inefficiencies of any form (such as idle time, spoilage, under-utilisation of plant and machinery, poor planning etc.)
 9. To establish effective control over material, men and overhead
 10. To enable to check and control wastages of all types.
 11. To assist in improving operative efficiency, not only the overall efficiency, but efficiency at every point.
 12. To establish an effective system of reporting
 13. To help in measuring the efficiency of wage system and to guide the management in the formulation and implementation of incentive bonus schemes based on productivity and cost saving.
 14. To enable the management to know and plug the inefficiencies and weak points in the business activities.
 15. To help the management in properly defining and fixing up of responsibilities on the employees.
 16. To identify cost centres and to meet the needs of cost accounting system
 17. To implement perpetual inventory system
 18. To prevent manipulating, pilferage, theft, misappropriations, etc., of materials and assist in furnishing correct and reliable cost data to the management.
 19. To help in the valuation of inventory
 20. To help in regulating production
 21. To inculcate the habit of making calculations before taking decisions
 22. To provide an independent and most reliable check on the accuracy of financial accounts through reconciliation of profits as per cost accounts and financial accounts.

23. To provide ready figures relating to problems like price fixation, price control, tariff protection, wage level fixation, settlement of disputes etc. for use by the government, wage tribunals, trade unions etc.

1.3 ADVANTAGES OF COST ACCOUNTING :

Concerned primarily with provision of cost information for internal use by management, cost accounting aids management in setting objectives and programmes of operation (which is known as planning), in comparing actual performance with expected performance (known as control), in financial reporting (called income measurement), and in making tactical and strategic decisions (also known as policy). This benefits to management may be summarised as under.

1. **Basis for fixing the price** : Cost forms a basis for fixing the price for a product or service. If the price is already decided in the market, then cost becomes a challenge to meet with.
2. **Formulate policies** : Helps the management in formulating several policies.
3. **Utilisation of resources** : Helps in the optimum utilisation of resources, Labour, machine, material etc.
4. **Locate causes** : Helps to locate the exact causes for the variation in profit or loss.
5. **Areas for corrective actions** : Helps to identify the areas requiring corrective actions
6. **Information for decision making** : Provides suitable information for taking managerial decisions such as make or buy, whether to accept an order or not, continue a product or discontinue, use the capacity or not, acceptability or otherwise of a project, to export or not etc.
7. **Facilitates comparison** : Helps to compare the costs of different activities and periods
8. **Effective control** : Helps to provide an effective control over various elements of cost.
9. **Efficiency** : Helps to practice efficient ways of performance
10. **Government policy** : Provides an useful information to Government and various bodies for taking decisions and formulating policies. For example, excise policies are framed based on cost details
11. **Management by exception** : Helps management by exception rendering reports of relevant costs and significant variances only.

- 12. Cost reduction** : Helps in introducing techniques for cost reduction, value analysis, cost benefit analysis, quantitative measurement etc.
- 13. Valuation** : Provides useful information to determine the cost of closing stock – raw material, WIP and finished goods.
- 14. Fixation of responsibility centres** : Facilitate fixation of responsibility centres such as profit, revenue, cost, investment, contribution centre, in order to exercise control and measure the growth.
- 15. Perpetual inventory system** : Helps to introduce perpetual inventory system.
- 16. Cost Audit** : Facilitates cost audit and management audit programme
- 17. Quotations** : Helps to prepare quotations for job orders or work orders
- 18. Control** : Helps to have effective control over materials, labour etc. for efficient management of the same.
- 19. Budgets** : Helps in preparing budgets and exercise budgetary control
- 20. Focus** : Focuses on profit and profitability position of the organisation.

1.4 LIMITATIONS OF COST ACCOUNTING :

Cost Accounting can never be an exact science because of the inherent element of judgement. There is, often no uniformity in costs ascertained by different cost accountants using the same data. Disagreements in the cost of a product usually arise owing to different procedures of cost ascertainment, allocation and apportionment followed by cost accountants. For this reason, cost results must be accepted as reasonable approach to accuracy and not as price measurements. Accuracy in cost accounting is, therefore, relative. Unless uniform principles are followed in the collection, allocation and apportionment of expenses, results are bound to be different. Also, costs have no utility in themselves. Their usefulness, to a large extent, depends on how promptly remedial steps are taken up by top management, once certain loopholes are detected and pointed out by the cost accountant.

- 1. It is expensive** : The system of cost accounting involves additional expenditure to be incurred in installing and maintaining it. However, before installing it, care must be taken to ensure that the benefits derived is more than the investment made on this system of accounting.
- 2. The system is more complex** : As the cost accounting system involve number of steps in ascertaining cost such as collection and classification of expenses, allocation and apportionment of expenses, it is considered to be complicated system of

accounts. Moreover, the system makes use of several documents and forms in preparing the reports. This will tend to delay in the preparation of accounts.

- 3. Inapplicability of same costing method and technique :** All business enterprises cannot make use of a single method and technique of costing. It all depends upon the nature of business and type of product manufactured by it. If a wrong technique and method is used, it misleads the results of business.
- 4. Not suitable for small scale units :** A cost accounting system is applicable only to a large sized business but not a small sized business but not to a small sized one. Hence, there is limitation to its application to all types of business.
- 5. Lack of accuracy :** The accuracy of cost accounting get distorted owing to the use of notional cost such as standard cost, estimated cost etc.
- 6. In lacks social accounting :** Cost accounting fails to take into accounts the social obligations of the business. In other words, social accounting is outside the purview of cost accounts.

1.5 INSTALLATION OF COST ACCOUNTING SYSTEM :

Cost Accounting is an independent system. Many advantages are derived to the organisation from this system. In the wake of computer invasion, the scope and horizon of the system has enlarged. It has become almost a necessity for every organisation in the light of severe competition. Vital cost information generated from the system helps to have competitive edge over others. Certain expenses are incurred to install this system. The advantages from the system would outweigh the expenses to be incurred, in the long run. Not only the big firms, even the small firms can develop cost consciousness by introducing the system in a simple and small way. Care should be taken to see that the system is installed properly otherwise it may become a burden to the firm,

The extent of the requirement and complexity of the system depends on the objectives of the management. It must not only meet the internal needs but also the external needs, such as legal requirements, Government and Industry.

Factors to be considered :

1. It should be simple, practical and easy to operate and understand
2. It should give accurate, timely and adequate information
3. Cost of installation should justify the advantages.
4. It should meet the requirements for a reasonably long period
5. It should be flexible and so adaptable to changing circumstances

6. It should be conducive and welcomed by the employees
7. It should be acceptable to the management
8. It should ensure efficient performance.

Steps :

Installation of cost accounting system involves steps which are broadly divided into two :

(A) Preliminary Steps :

At the outset, the information about the organisation should be obtained. They relate to

1. Nature of business and operating scale and size.
2. Nature of products manufactured and number of products or nature of service rendered
3. Operating processes and technicians involved
4. Organisational chart and Layout of factory
5. Details of objectives – main and subsidiary, responsibilities, departments, categorisation etc.
6. Material description
7. Operational flow charts and schedules.
8. Details of labour force
9. Existing physical facilities provided
10. Details of production and service departments
11. Establishment of standard time through time and motion study and work measurement
12. Examination of existing documents and reports for internal and external purposes.
13. Interaction with various levels of management

B. Final Steps : Against such a background, actual system is introduced through the following steps.

14. Establishment of organisational chart as revised and required
15. Codifying and Classifying of various cost elements
16. Developing cost centres and determining cost units.
17. Devising methods and determining basis for cost allocation, cost apportionment and cost absorption

18. Methods of segregating fixed and variable costs
19. Developing necessary and appropriate formats for statements and reports
20. Determining the periodicity for generating information
21. Establishing Chart of Accounts and Manual detailing the various control accounts to be maintained.
22. Guidelines for the appraisal and feedback of the Cost Accounting System.

1.6 IDEAL SYSTEM OF COST ACCOUNTING:

An ideal system of cost accounting when installed and handled properly will be able to offer a number of benefits to management, employees in particular and society in general. Such a system must possess the following features :

1. **Suitable** : It must be suitable. It must be devised according to the nature, conditions, requirements and size of the organisation.
2. **Simple** : It must be simple and easy to understand and implement.
3. **Flexible** : The system must be flexible enough to take note of changes that confront an organisation from time to time.
4. **Economical** : The system must be cost – effective. The benefits must outweigh the costs.
5. **Comparable** : The management must be able to make comparison of facts with the past figures, figures of other concerns or other departments of the same unit.
6. **Timely** : it must be able to provide useful cost data when required.
7. **Uniform** : All forms and proformas etc., necessary to the system should be of uniform size and quality.
8. **Labour – saving** : The system must involve minimum clerical work. Employees should feel it easy while implementing the system.
9. **Control** : It must provide for a satisfactory system of control over materials, labour and overhead costs.
10. **Reconciliation** : The system must be so devised that the financial as well as cost records are capable of easy reconciliation.

1.7 FINANCIAL ACCOUNTING VS. COST ACCOUNTING

Basis for Difference	Financial Accounting	Cost Accounting
1. Objective	The objective is to find out the profitability of operations during a particular period for the benefit of owners and outsiders.	The objective here is to help management through the provision of prompt cost data and thereby improve managerial decision making.
2. Coverage	Here, the transactions are recorded for a definite period. It mainly deals with all commercial transactions.	Here the transactions are identified with cost units. Attention is focussed on transactions relating to manufacturing.
3. Analysis of Costs	In Financial accounting the expenditure is analysed item-wise, e.g., wages, salaries, depreciation etc., hence it is not amenable for offering a commentary.	Records expenses by departments, elements, produces or processes to study them analytically.
4. Analysis of profits	The profitability of individual products or departments is not known.	The profits or loss relating to each job, process, operation department can be found out.
5. Material control	Material control is not ensured, as figures are not available.	A systematic procedure for purchasing, storing and issuing of materials exists.
6. Labour cost control	Wage sheets under financial accounting do not reveal labour efficiency, idle time and effective hours of work. Hence, control not possible.	Labour time records and wage sheets permit management to find out effective and idle hours and ensure control accordingly.
7. Cost Classification	Distinction between fixed and variable costs not	Costs are classified into fixed and variable elements and

	maintained.	attention is focussed on controllable costs, which can be reduced by suitable steps.
8. Stock Valuation	Here, stock valued at cost price or market price, whichever is less.	Here stock is valued at cost.
9. Control means	Does not provide any means to measure the efficiency and exercise control over costs.	Techniques like standard costing employed to ensure control over operations.
10. Recording	Records actual (historical) costs. It is only a post-mortem examination of events that have taken place, leaving very little room for initiative corrective steps promptly.	Actual facts are combined with estimated ones while recording transactions. Transactions are recorded in an objective manner, according to the purpose for which costs have been incurred.
11. Comparison	Data here is not sufficient for drawing inter-period and inter-firm comparisons from time to time.	Detailed comparison of results of two periods or two firms in an industry possible in cost accounting.
12. Legal need	Statements prepared as per the legal requirements, i.e., as laid down by Companies Act, Income Tax Act.	Statements prepared internally as per the managerial requirements.
13. Approach	Data generated for external parties. Deals with external transactions.	Data generated for managerial decision-making. Deals with internal transactions.

1.8 QUESTIONS

A. Short Answer Questions :

1. What is Costing?
2. Explain the advantages of costing.
3. What are the characteristics of good system of costing?
4. Explain the objectives of cost accounting.
5. Define the concept of cost accounting.

B. Essay Questions :

1. Explain the nature and scope of cost accounting
2. Define cost accounting and explain the advantages of it
3. Explain the benefits of limitations of cost accounting
4. Describe the objectives and advantages of cost accounting.
5. Distinguish between Financial Accounting and Cost Accounting
6. What essential points should be kept in view while installing a new costing system.
7. Bring out the pre requisites for the installation of cost accounting system.

1.9 SUGGESTED READINGS

1. Bhattacharyya, S.K., John Dearden, Costing for Management, Vikas Publishing House Pvt. Ltd., 2002
2. Jayanta Mitra, Cost & Management Accounting, Books & Allied (P) Ltd., Calcutta.
3. Lall Nigam, B.M., Cost Accounting Principles and practices, Prentice Hall of India Private Limited, New Delhi.
4. Pandey, I.M., Management Accounting, Vikas Publishing House Pvt. Ltd., 2001
5. Ramachandran, Accounting for Management, Scitech Publications (India) Pvt. Ltd., 2003
6. Sahaf, M.A., Management Accounting, Principles and Practices, Vikas Publishing House Pvt. Ltd. New Delhi, 2004

Chapter – 2

Role and Scope of Management Accounting

Objectives :

After reading this you should be able to :

- Understand the meaning, definition and scope of management accounting
- Distinguish Management Accounting with Financial Accounting and Cost Accounting.
- Know the tools and techniques of management accounting.
- Understand the functions, advantages and limitations of management accounting.

Structure :

2.1 Introduction

2.2 Scope of Management Accounting

2.3 Financial Accounting – Management Accounting –
Cost Accounting

2.4 Tools & Techniques of Management Accounting

2.5 Role of Management Accounting

2.6 Functions of Management Accounting

2.7 Advantages of Management Accounting

2.8 Limitations of Management Accounting

2.9 Questions

2.10 Suggested Readings

2.1 INTRODUCTION :

Accounting information is becoming increasingly critical to the continuing success of a business organisation. As business organisations have begun to recognise this vital

resource and their dependence on it, they have also begun to realise that a system for managing this resources is essential. This, perhaps the basic reason for business students to possess some knowledge about accounting.

Modern accounting as a dynamic and growing field has to monitor and analyse the rapidly changing business environment. It has to serve as a vehicle for communicating the essential data about the financial activities of a business to its management for making decisions. At the same time, management must possess a fair knowledge of tools and techniques that it can use for analysing and interpreting the available information in order to accomplish managerial objectives.

The term 'management accounting' is the modern concept of accounts as a tool of management. It is a broad term and is concerned with all such accounting information that is useful to management. In simple words, the term management accounting is applied to the provision of accounting information for management activities such as planning, controlling and decision making etc. Thus, 'any form of accounting which enables a business to be conducted more efficiently' may be regarded as management accounting. Management accounting information can help managers identify problems, solve problems and evaluate performance.

2.1.1 Meaning and Definition :

According to National Association of Accountants (USA), management accounting is 'the process of identification, measurement, accumulation, analysis, preparation and communication of financial information used by management to plan, evaluate and control within the organisation and to assure appropriate use and accountability for the resources.

In the words of R. Anthony, 'Management Accounting is concerned with accounting information that is useful to management.

J.L. Batty : 'Management Accounting is the term used to describe the accounting methods, system and technique which, coupled with special knowledge and ability, assist management in its task of maximising profits or minimising losses.

ICMA London : Management accounting is the application of professional knowledge and skill in the preparation of accounting information in such a way as to assist management

in the formation of policies and in the planning and control of the operations of the undertaking.

T.G. Rose : Management accounting is the adaptation and analysis of accounting information and its diagnosis and explanation in such a way as to assist management.

2.2 SCOPE OF MANAGEMENT ACCOUNTING :

Management accounting has a very wide scope. It includes not only financial accounting and cost accounting but also all types of internal financial controls, internal audit, tax accounting, office services, cost control and other methods and control procedures. Thus scope of management accounting, inter alia includes the following.

1. **General Accounting** : The general accounting records, external transactions covering cash receipt and payments, liabilities and setting up of sales and receivables. It also covers preparation of regular financial statements which are prepared from various account balances.
2. **Cost Accounting** : It consists of the application of double entry technique of internal transactions which means the application of costs to jobs, operations, processing and products. It helps in sharpening the internal aspects of general accounting.
3. **Budgeting and Forecasting** : This envisages the framing of budgets in cooperation with operating and other departments preferably using standard measures for amounts included in the budgets.
4. **Cost Control Procedure** : These provides for internal reports which will compare actual and desired performance. It also helps in converting a budget into an operating plan.
5. **Cost and Statistics** : It is concerned with provision of statistical and analytical services to the various departments of the organisation
6. **Taxation** : This requires the computation of income in accordance with the income in accordance with the income tax laws and regulations, filing of returns and making tax payments on or before a specific date.
7. **Methods and Procedures** : These deal with organisation reducing the cost and improving the efficiency of accounting a also of office operations, including and

preparation and issuance of accounting and other manuals, where these will prove useful.

2.3 FINANCIAL ACCOUNTING – MANAGEMENT ACCOUNTING – COST ACCOUNTING

Financial Accounting : The purpose of Accounting is to ascertain the financial results i.e., profit and loss in the operations during a specific period. It is also aimed at knowing the financial position, i.e., assets, liabilities and equity position at the end of the period.

Cost Accounting : The purpose of cost accounting is to analyse the expenditure so as to ascertain the cost of various products manufactured by the firm and fix the prices. It also helps in controlling the costs and providing necessary costing information to management for decision making.

Management Accounting : The purpose of management accounting is to assist the management in taking rational policy decisions. This branch of accounting is primarily concerned with providing the necessary accounting information about funds, costs, profits, etc., to the management.

Now let us go through the differences between Financial Accounting and Management Accounting.

2.3.1 Differences between Financial Accounting and Management Accounting

Basis for Difference	Financial Accounting	Management Accounting
1. Objective	The primary objective of financial accounting is to ascertain profit and to find out financial status of a	The primary objective of management accounting is to provide accounting information to the

	concern. It provides financial data of the organisation to the shareholders and creditors	management in day to day operations for taking proper decisions.
2. Nature	Financial Accounting is concerned almost exclusively with historical records and past performance	Management accounting is concerned with future plans and policies.
3. Dependency	Financial accounting is not dependent on management accounting	Management accounting depends on financial accounting for vital information
4. Application of Accounting Principles	If adheres to Generally Accepted Accounting principles	Each accounting principles are not considered.
5. Approach	Financial Accounting is historical in approach. Financial accounts are the results of the past events, only past expenses and incomes are recorded	Management accounting is predictive in approach . It is concerned more with future Thus, all information are in the form estimates and budgets for future
6. Presentation	These accounts are presented in a specific form either prescribed by law or by convention	Here no such form is prescribed. The information can be presented in any way suitable to the management needs
7. Control	It does not lay emphasis on control	Management accounting control the performance of the organisation by preparing performance reports for each responsibility centre

8. Valuation of stock	Stocks are valued on the principle of cost or market price whichever is lower.	No such principle is followed for valuation of stocks
9. Statutory obligation	Financial accounting is guided by statutes	Management accounting is not statutory
10. Audit	Audit of financial accounts is compulsory	Audit of management accounts is not compulsory

2.3.2 Differences between Cost Accounting and Management Accounting

Basis for Difference	Cost Accounting	Management Accounting
1. Objective	The primary objective of cost accounting is to set routine, budgets and standards. It is mainly aimed at knowing the per unit cost of output.	The primary objective of management accounting is to measure actual performance and report to the management for taking corrective actions by detecting the mistakes.
2. Scope	It is primarily concerned with cost allocation	Its scope is wider. It covers financial accounting and tax accounting
3. Applicability	It is generally applicable to manufacturing concerns.	Management accounting methods and techniques are applicable to all concerns
4. Data used	Here quantitative figures are used	Here both quantitative and qualitative costs are used
5. Transactions	Cost accounting embraces internal as well as external	Management account is concern with internal

	transactions	transactions
6. Future Activities	Cost accounting does not attach importance to future activities.	Future activities are primarily considered.

2.4. TOOLS & TECHNIQUES OF MANAGEMENT ACCOUNTING :

Management accounting uses a number of tools and techniques to help management in achieving business goals. Some of the important tools and techniques are as follows.

1. **Financial Planning** : Planning is necessary not only for efficient utilisation of available resources but also for better and progressive business results. It is more significant for financial functions because finance plays a deciding role in managerial decisions. Financial planning is the process of deciding in advance the financial objectives, policies and procedures. An organisation can achieve long term as well as short term financial objectives by employing financial planning. In the short term it can help a concern in meeting its obligations by balancing the flow of funds. At the same time, its proper application can ensure efficient utilisation of available financial resources in the long period.
2. **Analysis of financial statement** : Financial Statement analysis is a growing and ever changing set of systems and procedures designed to provide decision-makers with relevant information derived from the basic sources of data such as company financial statements and government and industry publications. Over the years number of techniques have been devised to analyse financial statements e.g., comparative financial statements, common size statements, ratio analysis, trend analysis and funds flow statement.
3. **Cost Accounting** : Cost Accounting is a vital part of the accounting system. It includes the recording, classifying, analysis and reporting of all cost aspects of company performance. The cost accounting procedures have to be designed with great care keeping in view the nature and requirements of the firm and the data required at the different levels of management for effective cost control and cost reduction.

4. **Standard Costing** : Another major technique for operating control through management accounting is standard costing. Under this arrangement standard costs are used to control the major activities of the business. Standard costs are predetermined targets against which actual results are evaluated. This is the basis for a system of management control, for which a proper monitoring of performance is a key factor. The variances between standard and actual costs are computed and reported to management.
5. **Marginal Costing** : Marginal costing is a managerial technique that considers only variable cost in the additional output decisions. It is a reporting system that values inventory and cost of sales at its manufacturing variable cost. It is frequently used an internal management reporting system.
6. **Budgetary Control** : Budgetary control refers to a system of business control that uses budgets to control the major activities of business. The budgets for all major activities of the business are prepared in advance. Generally, the budget is prepared by updating the previous year's figures in the light of some forward projections.
7. **Funds Flow analysis** : Funds flow analysis attempts to highlight the causes of change in the financial condition of a business enterprise between two dates. Any statement prepared for this purpose refers to as funds flow statement. A funds flow statement helps management in the efficient planning and control of cash.
8. **Management reporting** : Management reporting is considered as an essential component of a well designed planning and control system. Decision makers frequently require information on various aspects of business. Thus, it is the responsibility of the management accountant to communicate right information to the management at the right time and in a right manner.
9. **Statistical analysis** : Accountants frequently confront masses of data from which they draws systematic and logical conclusions.

2.5 ROLE OF MANAGEMENT ACCOUNTING :

The person who is entrusted with management accounting function in an organisation is known as Management Accountant. The position of the management accountant varies from organisation to organisation. He may be considered as head of the accounting department or as a member of the Board of Director or Controller. Whatever may be his designation and placement, his functions and duties will be the same.

The designation of the person who is entrusted with the management accounting functions in an organisation vary from company to company. In some large concerns, he is called controller or Management Accountant. In some other concerns he is designated as Chief Accountant or Chief Accounts Officer, Controller of Accounts, Finance Controller or Finance Director.

Whatever may be organisational setup and intra-organisational relationships, the practitioner of management accounting must be so placed that he is in a position to exercise effective independent judgement on business problems. He must be involved as an active participant in the management. As remarked by Anderson and Schmidt "the Management Accountant will be specially concerned about the problems of cooperation with all other organisation units. In some organisations he may be member of the board of directors, in other he may be subordinate to the managing director.

2.6 FUNCTIONS OF MANAGEMENT ACCOUNTING :

The primary objective of a management accounting system is to supply meaningful information to the management. To achieve this goal, it has to carry out many activities which are normally referred to as functions of management accounting. The major functions summarized below.

1. **Planning** : Information and data provided by management accounting helps management to forecast and prepare short term and long term plans for the future activities of the business and formulate corporate strategy. For this purpose management accounting techniques like budgeting, standard costing, marginal costing, probability, correlation and regression, etc., are used.
2. **Coordinating** : Management accounting techniques of planning also help in coordinating various business activities. For examples, while preparing budgets for various departments like production, sales, purchases etc. there should be full coordination so that there is no contradiction. By proper financial reporting, management accounting helps in achieving coordination in various business activities and accomplishing the set goals.
3. **Controlling** : Controlling is a very important function of management and management accounting helps in controlling performance by control techniques such as standard costing, budgetary control, control ratios, internal audit etc.

4. **Communication** : Management accounting system prepares reports for presentation to various levels of management which show the performance of various sections of the business. Such communication in the form of reports to various levels of management helps to exercise effective control on various business activities and successfully running the business.
5. **Financial analysis and interpretation** : In order to make accounting data easily understandable, the management accounting offers various techniques of analysing, interpreting and presenting this data on non-accounting language so that every one in the organisation understands it. Ratio analysis cash flow and funds flow statements, trend analysis etc. are some of the management accounting techniques which may be used for the financial analysis and interpretation.
6. **Qualitative information** : A part from monetary and quantitative data, management accounting provides qualitative information, which helps in taking better decisions. Quality of goods, customers and employees, legal judgements, opinion polls, logic, etc. are some of the examples of qualitative information supplied and used by the management accounting system for better management.
7. **Tax Policies** : Management accounting system is responsible for tax policies and procedures and supervises and coordinates the reports prepared by various authorities.
8. **Decision making** : Correct decision making is crucial to the success of a business. Management accounting has certain special techniques which help management in short term and long term decisions. For example, techniques like marginal costing, differential costing, discounted cash flow, etc., help in decision such as pricing of products, make or buy, discontinuance of a product line, capital expenditure etc.

2.7 ADVANTAGES OF MANAGEMENT ACCOUNTING :

Management accounting offers the following benefits to the enterprise.

1. It increases the efficiency in the activities of the business
2. It ensures efficient regulation of business activities by establishing efficient system of planning and budgeting
3. It makes possible the efficient utilisation of the available resources and thereby increase the return on capital employed.
4. It ensures effective control by comparing actual results with the standards

5. It maintains a good public relation by providing quality service to the customers of the business;
6. It provides means to motivate the employees of the organisation
7. It keeps management informed about the on-going operations enabling it to suggest remedial measures in case of deviations; and
8. It helps in evaluating the efficiency and effectiveness of the company's business policies with the incorporation of management audit.

2.8 LIMITATIONS OF MANAGEMENT ACCOUNTING :

Management accounting is a very useful tool of management. However, it suffers from certain limitations as stated below.

1. **Based on historical data** : Management accounting helps management in making decisions for the future but it is mainly based on the historical data supplied by financial accounting and cost accounting. This implies that historical data is used for making future decisions. In other words, if past data is not accurate, management decisions may not be correct.
2. **Lack of wide knowledge** : The management accountant should have knowledge of not only financial and cost accounting but also many allied subjects like economics, management, taxation, statistical and mathematical techniques etc. Lack of knowledge of these subjects on the part of management accountant limits the quality of management accounting.
3. **Complicated approach** : Management accounting provides mass of data using various accounting and non accounting subjects for decision making purpose. But sometimes, management avoids this complicated and lengthy course of decision making and makes decisions based on intuition. This leads to unscientific approach to decision making.
4. **Not a substitute of management** : Management accounting only provides information to management for decision making, but it is not a substitute of management and administration.
5. **Costly system** : The installation of management accounting system in an organisation is a costly affair as it requires a wide net work of management information system, rules and regulations. All this requires heavy investment and small concerns may not be able to afford it.

6. **Developing stage** : Management accounting is a relatively recent development and it has not fully developed as yet. This limits the utility of this system to management in making perfect and correct decisions.
7. **Lack of objectivity** : The interpretation of information provided by management accounting may be influenced by personal bias of the interpreter of data. This tells upon the quality of managerial decisions.
8. **Resistance from staff** : The existing accounting and management staff may not welcome the introduction of management accounting system. This may be because they look at the system with suspicion that will add to their work and responsibilities.

2.9 QUESTIONS

A. Short Answer Questions :

1. What are the limitations of Financial Accounting?
2. Define Management Accounting
3. State the scope of Management Accounting
4. State the role of the Management accountant in the Management of a firm.

B. Essay Questions :

1. What is management accounting? Explain the reasons for its origin.
2. Define Management Accounting. Explain objectives and functions.
3. Explain the functions of management accounting. State the nature and scope of management accounting.
4. Explain the detail the meaning, scope and objectives of management accounting.
5. Explain the differences between Cost accounting and Management Accounting
6. Explain the methods and techniques of management accountings
7. Explain the advantages and limitations of management accounting
8. Explain the differences between financial accounting and management accounting

2.10 SUGGESTED READINGS

1. Bhattacharyya, S.K., John Dearden, Costing for Management, Vikas Publishing House Pvt. Ltd., 2002
2. Jayanta Mitra, Cost & Management Accounting, Books & Allied (P) Ltd., Calcutta.

3. Lall Nigam, B.M., Cost Accounting Principles and practices, Prentice Hall of India Private Limited, New Delhi.
4. Pandey, I.M., Management Accounting, Vikas Publishing House Pvt. Ltd., 2001
5. Ramachandran, Accounting for Management, Scitech Publications (India) Pvt. Ltd., 2003
6. Sahaf, M.A., Management Accounting, Principles and Practices, Vikas Publishing House Pvt. Ltd. New Delhi, 2004

Lesson - 3

MATERIALS

OBJECTIVES:

After studying this lesson you should be able to understand-

- How to control cost through stores records
- What are the different methods of valuing material issues
- What is inventory Control

STRUCTURE:

3.1 Introduction

3.2 Stores Records

3.2.1 Bin Card

3.2.2 Proforma of Bin Card

3.2.3 Stores Ledger

3.2.4 Proforma of Stores Ledger

3.2.5 Differences between Bin Card & Stores Ledger

3.2.6 Stores Requisition

3.3 Methods of Valuing Material Issues

3.3.1 Cost Price Methods

3.4 Inventory Control

3.5 Conclusion

3.6 Self Assessment Questions

3.7 Books Recommended

3.1 INTRODUCTION:

Material is very significant factor of production. It occupies more than 60% of cost of production. Material which forms part of a finished product is known as direct material. Hence proper control of material cost is necessary. Material control is accomplished through functional organisation, assignment of responsibility, and documentary evidence obtained in various stages of operation.

Effective control also requires the systematic preparation of periodic summaries and reports. The bin cards and the stores ledger are the two important stores records that are generally kept for making a record of the various items of stores.

3.2 STORES RECORDS OR MATERIAL RECORDS

For recording the purchases, issues and balance of stock available, in the stores, the company prepares two stores records viz stores ledger and bin card, preparation and maintenance of stores ledger and bin card is the duty of store keeper.

3.2.1 Bin Card :

The stock record maintained by stores department is known as Bin Card. Bin refers to as shelf or rack. It makes a record of the receipt and issue of material and is kept for each item of stores received is entered in the receipt column and the quantity of stores issued is recorded in the issue column of the bin card and a balance of the quantity stores is taken after every receipt or issue, so that the balance at any time can be readily seen. These cards are maintained by the storekeeper. These cards also assist the store keeper to control the stock. For each item of stores minimum quantity, maximum quantity and ordering quantity are stated on the card.

Double Bin System : Some concerns divide the bin, rack or shelf in two parts, namely the smaller part to store the quantity equal to the minimum quantity and the other part to store the remaining quantity and the other part to store the remaining quantity. The quantity in the smaller part is not issued so long as the quantity is available in the other part. This system helps in exercising stores control in an effective way as it facilitates physical verification and services as a signal when it becomes necessary to use the quantity kept in the smaller part.

Merits of bin card :

1. By seeing the bin card, the store keeper can send the material requisition for the purchase of material in time.
2. The store keeper should have a stock record under him.
3. Maintenance of bin cards is desired to have up to date balance of stock.

3.2.5 Differences between Bin Card and Stores Ledger :

	Bin Card		Stores Ledger
1.	Bin card is a record of only quantities	1.	Stores ledger is a record of both quantities and values
2.	It is maintained by the store keeper	2.	It is maintained by the costing department
3.	Transactions are posted normally just before the transaction takes place.	3.	Transactions are posted after the transaction takes place.
4.	Each transaction is individually posted.	4.	Transactions may be summarised and posted periodically
5.	Bin is usually kept inside the stores	5.	Stores ledger is kept outside the stores.

3.2.6 Stores Requisition :

Materials are held in stores for utilisation but the storekeeper must not issue materials unless a properly authorised material requisition is presented to him. The store keeper is always to issue the material on proper authority. This authority is usually given by the foreman of the production department on a form known as material requisition. The proforma is given below :

3.2.4 Proforma of Stores Ledger :

' X ' Company limited

Stores Requisition

Department

No

Job No.....

Date

To

The store keeper

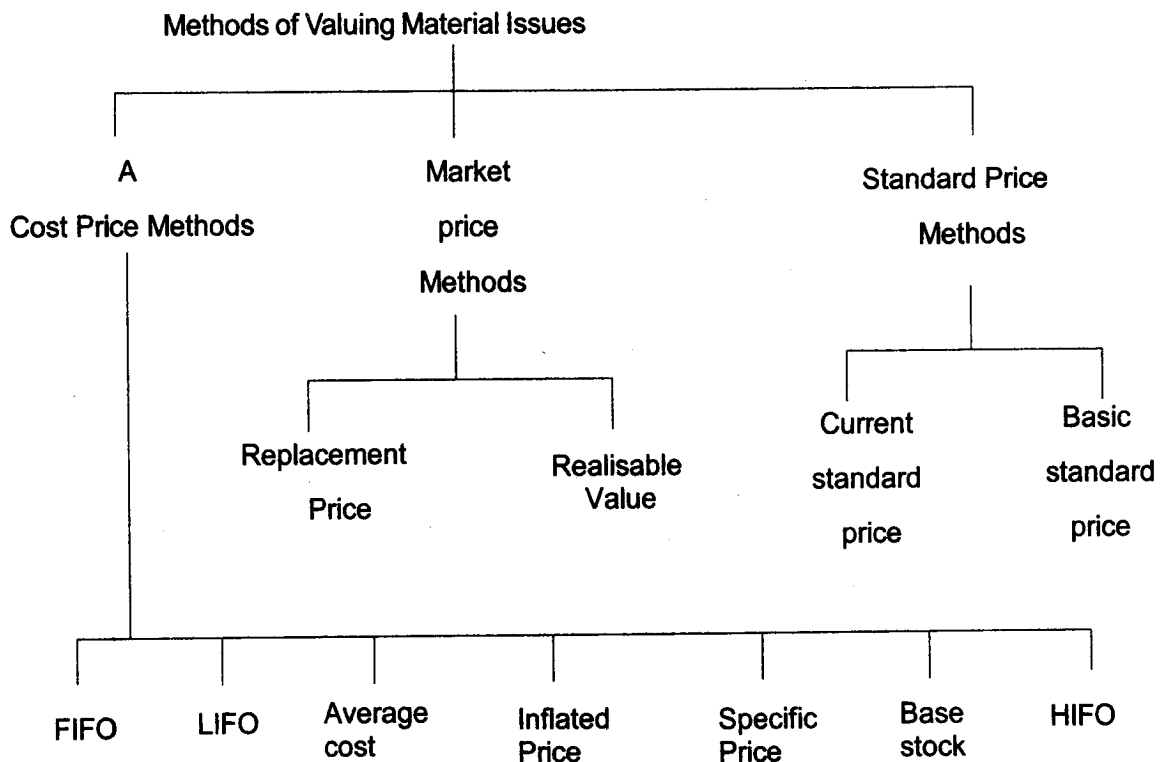
please issue the materials stated here in

Description	Code No.	Quantity	For cost Rate	Office Amount	Bin Card No.	Stores Ledger folio	Remarks

3.3 METHODS OF VALUING MATERIAL ISSUES :

Materials issued from the stores are debited to the jobs or work orders which received them and credited to the materials account. These jobs are debited with the value of materials issued to them. There are many methods of pricing material issues. A very careful choice has to be made of the methods of valuing the material issues because it influences the cost of the job and the value of the closing balances of material in the stores. The various methods of pricing material issues given above are the cost assignment methods and do not necessarily relate to the physical flow of materials on and off the shelves. A good method of valuing materials, issues should satisfy the following conditions.

1. The issue price should recover the cost price of the materials
2. The issue price must be near the market price
3. The issue price should not lead to any variation in cost of similar jobs from period to period.
4. The issue price should not necessitate adjustments in values of stock of materials.
5. The price should consider management policy relating to valuation of closing stock.
6. A method of valuation of material issues should take into consideration the nature of materials used. There are many methods of pricing material issues, the most important are -
 - A. Cost price methods -
 - i. First in first out
 - ii. Last in First out
 - iii. Average cost
 - iv. Inflated price
 - v. Specific price
 - vi. Base stock
 - vii. Highest in First out.
 - B. Market price Methods -
 - i. Replacement price
 - ii. Realisable value
 - C. Standard price methods
 - i. Current standard price
 - ii. Basic standard price



3.3.1 Cost price Methods :

A. First in First Out Method [FIFO] :

Under this method materials received first are issued first. The units in the opening stock of materials are treated as if they are issued first, the units from the first purchase issued next, and so on until the units left in the closing stock of materials are valued at the latest cost of purchases. It follows that unit costs are apportioned to cost of production according to their chronological order of receipts in the store.

This method is suitable in times of falling prices. It is not suitable in case of rising prices.

Merits :

1. The FIFO method is simple to understand and easy to operate.
2. Materials are issued in order of purchases, so materials received first are utilised first.

3. This method recovers the cost price of the materials because materials are issued at the purchase price.
4. In case of falling prices this method is useful.
5. This method is useful when transactions are not too many.

Demerits :

1. There is scope for clerical errors, if consignments are received frequently at fluctuating prices.
2. In case of fluctuations in prices of materials comparison between one job and the other job becomes difficult.
3. In case of rising prices this method is not useful.

Illustration :

From the following information write at the stores ledger account in respect of the materials for the month of January. Issues are to be priced on the principle of first in first out.

Jan 1 opening balance : 500 units at Rs 4.00.

Jan 5 received from vendor 200 units at Rs. 4.25.

Jan 12 received from vendor 150 units at Rs. 4.10.

Jan 20 received from vendor 300 units at Rs. 4.50.

Jan 25 received from vendor 400 units at Rs. 4.00.

Issues of material were as follows :

Jan 4 - 200 units

Jan 10 - 400 units

Jan 15 - 100 units

Jan 19 - 100 units

Jan 26 - 200 units

Jan 30 - 250 units

FIFO METHOD :**STORES LEDGER ACCOUNT**

Material..... Bin no..... Folio.....
 Size..... Code No..... Maximum No
 Location Minimum No

DATE	Particulars	RECEIPTS			ISSUES			BALANCE		
		Quantity Units	Total Cost Rs	Unit Cost Rs.	Quantity Units	Total Cost Rs	Unit Cost Rs.	Quantity Units	Amount Rs.	Per unit Rs.
Jan 1	Balance b/d	-	-	-	-	-	-	500	2000	4.00
Jan 4	Issue	-	-	-	200	800	4.00	300	1200	4.00
Jan 5	Goods received	200	850	4.25	-	-	-	300 200	1200 850	4.00 4.25
Jan 10	Issue	-	-	-	300 200	1200 425	4.00 4.25	100	425	4.25
Jan 12	Purchases	150	615	4.10	-	-	-	100 150	425 615	4.25 4.10
Jan 15	Issue	-	-	-	100	425	4.25	150	615	4.10
Jan 19	Issue	-	-	-	100	410	4.10	50	205	4.10
Jan 20	Purchases	300	1350	4.50	-	-	-	50 300	205 1350	4.10 4.50
Jan 12	Purchases	400	1600	4.00	-	-	-	50 300 400	205 1350 1600	4.10 4.50 4.00
Jan 10	Issue	-	-	-	50 150	205 675	4.10 4.50	150 400	675 1600	4.50 4.00
Jan 10	Issue	-	-	-	150 100	675 400	4.50 4.00	300	1200	4.00

Illustration : 2

From the following particulars, prepare stores ledger account, showing the pricing of materials issues, by adopting FIFO method.

- 1- 12 - 2007 Opening stock 500 unit at Rs 2 each
- 3- 12 - 2007 Purchased 400 unit at Rs 2 -10 each
- 5- 12 - 2007 Issued 600 unit to job K
- 7- 12 - 2007 Purchased 800 unit at Rs 2.40 each
- 9- 12 - 2007 Issued 500 unit to job p
- 12- 12 - 2007 returned from job k 200 units
- 17- 12 - 2007 purchased 400 unit at Rs 2.50 each
- 25- 12 - 2007 Issued 600 unit to job y.

solution :

- Note ;
1. It has been presumed that the return of material too is in accordance with the method i.e. FIFO followed.
 2. Receipts of goods returned has been considered as a fresh receipt.

FIFO METHOD :**STORES LEDGER ACCOUNT**

Material..... Bin no..... Folio.....
 Size..... Code No..... Maximum No
 Location Minimum No

DATE	RECEIPTS			ISSUES			BALANCE		
	Quantity	Rate Rs	Amount Rs.	Quantity	Rate Rs	Amount Rs.	Quantity	Rate Rs	Amount Rs.
1-12-2007	-	-	-	-	-	-	500	2.00	1000
3-12-2007	400	2.10	840	-	-	-	500	2.00	1000
							400	2.10	840
5-12-2007	-	-	-	600	500x2 100x2.10	1000 210	300	2.10	630
7-12-2007	800	2.40	1920	-	-	-	300	2.10	630
							800	2.40	1920
9-12-2007	-	-	-	500	300x2.10 200x2.40	600 480	600	2.40	1440
12-12-2007	Return 200	100 x 2-00 100 x 2-10	200 210	-	-	-	600	2.40	1440
							100	2.00	200
							100	2.10	210
17-12-2007	400	2.50	1000	-	-	-	600	2.40	1440
							100	2.00	200
							100	2.10	210
							400	2.50	1000
25-12-2007	-	-	-	600	2.40	1440	100	2.00	200
							100	2.10	210
							400	2.50	1000

Closing stock - 600 units

Value Rs. 1410.

B. Last in First Out [LIFO] :

Under this method the issues are priced in the reverse order of purchase i.e the price of the latest available consignment is taken. This method is sometimes called replacement cost method. This method is suitable in times of rising prices because material will be issued from the latest consignment at a price which is closely related to the current price levels.

This method is suitable in times of falling prices. It is not suitable in case of rising prices.

Merits :

1. This method is simple to operate and is useful when transactions are not too many and the prices are fairly steady.
2. FIFO method recovers cost from production because actual cost of material is charged to production.
3. In times of rising prices, LIFO method is suitable.

Demerits :

1. This method may lead to clerical errors as every time an issue is made.
2. Comparison between two jobs will become difficult.
3. For pricing a single requisition, more than one price has often to be adopted.

Illustration 3 :

From the following information prepare stores ledger accounts under LIFO method.

- 2- 1 - 2008 Purchased 4000 unit at Rs 4.00 per unit
- 20- 1 - 2008 Purchased 500 unit at Rs 5.00 per unit
- 5- 2 - 2008 Issued 2000 units
- 10- 2 - 2008 Purchased 6000 units at Rs. 6.00 per unit
- 12- 2 - 2008 Issued 4,000 units
- 2- 3 - 2008 Issued 1000 units
- 5- 3 - 2008 Issued 2000 units
- 15- 3 - 2008 Purchased 4500 units at Rs 5.50 per unit
- 20- 3 - 2008 Issued 3000 units

LIFO METHOD :**STORES LEDGER ACCOUNT**

DATE	PURCHASES			ISSUES			BALANCE		
	Quantity	Price Rs	Amount Rs.	Quantity	Price Rs	Amount Rs.	Quantity	Price Rs	Amount Rs.
20-1-2008	4000	4.00	16000	-	-	-	4000	4.00	16000
20-1-2008	500	5.00	2500	-	-	-	4000 500	4.00 5.00	16000 2500
5-2-2008	-	-	-	500 1500	5.00 4.00	2500 6000	2500	4.00	10000
10-2-2008	6000	6.00	36000	-	-	-	2500 6000	4.00 6.00	10000 36000
12-2-2008	-	-	-	4000	6.00	24000	2500 2000	4.00 6.00	10000 12000
2-3-2008	-	-	-	1000	6.00	6000	2500 1000	4.00 6.00	10000 6000
5-3-2008	-	-	-	1000 1000	6.00 4.00	6000 4000	1500	4.00	6000
15-3-2008	4500	5.50	24750	-	-	-	1500 4500	4.00 5.50	6000 24750
20-3-2008	-	-	-	3000	5.50	16500	1500 1500	4.00 5.50	6000 8250

Closing stock - 3000 units, Rs. 14,250.

Illustration : 1

From the following date prepare stores ledger account by LIFO method.

1- 1 - 2008 Opening balance 200 unit at Rs 3

3- 1 - 2008 Purchased 300 units at Rs 4.

4- 1 - 2008 Issued 250 units

7- 1 - 2008 Purchased 100 units at Rs. 2.

9- 1 - 2008 Issued 50 units

10- 1 - 2008 purchased 300 units at Rs. 3.

11- 1 - 2008 Issued 200 units

On 8th January 2008 stock is verified and 10 units of shortage is identified.

solution :

Note ; The identified shortage of stock is treated as issue.

STORES LEDGER**LIFO Method**

DATE	RECEIPTS			ISSUES			BALANCE		
	Quantity	Price Rs	Amount Rs.	Quantity	Price Rs	Amount Rs.	Quantity	Price Rs	Amount Rs.
1- 1 - 2008	-	-	-	-	-	-	200	3	600
3- 1 - 2008	300	4	1200	-	-	-	200 300	3 4	600 1200
4- 1 - 2008	-	-	-	200 50	3 4	600 200	250	4	10000
7- 1 - 2008	100	2	200	-	-	-	250 100	4 2	10000 200
8- 1 - 2008 shortage	-	-	-	10	4	40	240 100	4 2	960 200
9- 1 - 2008	-	-	-	50	4	200	190 100	4 2	760 200
10- 1 - 2008	300	3	900	-	-	-	190 100 300	4 2 3	760 200 900
11- 1 - 2008	-	-	-	190 10	4 2	760 20	90 300	2 3	180 900

C. Average cost Method :

Under this method all of the materials in store are so mixed up that an issue cannot be made from any particular lot of purchases and therefore it is proper if the materials are issued at the average cost of materials in store. Average may be of two types.

- i. Simple Arithmetic Average
- ii. Weighted Arithmetic Average

i. Simple Arithmetic Average :

Simple average price is calculated by dividing the total of unit purchase prices of different lots in stock on the date of issue by the number of prices used in the calculation and quantity of different lots is ignored.

$$\text{Average Price} = \frac{\text{Total of unit purchase prices}}{\text{No. of Prices}}$$

ii. Weighted Arithmetic Average :

The weighted average price takes into account the price and quantity of the materials in store. Weighted Average price is a price which is calculated by dividing the total cost of materials could be drawn by the total quantity of materials in that stock.

$$\text{Weighted Average price} = \frac{\text{Value of Stock}}{\text{Quantity of Stock}}$$

Merits :

1. This method is rational, systematic and not subject to manipulation.
2. Average price method is considered to be the best method when prices fluctuate considerably.
3. Issue prices change only when new lot of materials is received.
4. This method recovers the cost of materials from production.
5. Average cost method is mostly used by different organisations because it satisfies most of the conditions of a good method of valuing material issues.

Demerits :

1. This method involves tedious calculation.
2. There are chances of clerical errors.
3. At the time of rising prices, it over-states profit.
4. Closing stock is not valued at current cost.

Illustration 5 :

The following transactions took place in respect of an item of material.

Date	Receipts Quantity	Rate Rs.	Issue Quantity
2-3-2007	200	2.00	-
10-4-2007	300	2.40	-
10-4-2007	-	-	250
28-5-2007	250	2.60	-
6-6-2007	-	-	200

Record the above transactions in the stores ledger, pricing the issues at :

- Simple Average rate
- Weighted Average rate.

STORES LEDGER
Average price method

DATE	PURCHASE			ISSUES			BALANCE		
	Quantity	Price Rs	Amount Rs.	Quantity	Price Rs	Amount Rs.	Quantity	Price Rs	Amount Rs.
2-3-2007	200	2.00	400	-	-	-	200	-	400
10-4-2007	300	2.40	720	-	-	-	200 500 300	-	400 1120 720
20-4-2007	-	-	-	250	2.20	550	250	-	570
28-5-2007	250	2.60	650	-	-	-	250 500 250	-	570 1220 650
6-6-2007	-	-	-	250	2.50	500	300	-	720

Simple Average prices

$$1. \left(\frac{\text{Rs } 2 + \text{Rs } 2.40}{2} \right) = 2.20$$

$$2. \left(\frac{\text{Rs } 2.40 + \text{Rs } 2.60}{2} \right) = 2.50$$

STORES LEDGER ACCOUNT
Weighted Average price

DATE	RECEIPTS			ISSUES			BALANCE		
	Quantity	Price Rs	Amount Rs.	Quantity	Price Rs	Amount Rs.	Quantity	Price Rs	Amount Rs.
2-3-2007	200	2.00	400	-	-	-	200	-	400
10-4-2007	300	2.40	720	-	-	-	500	-	1120
20-4-2007	-	-	-	250	2.24	560	250	-	560
28-5-2007	250	2.60	650	-	-	-	500	-	1210
6-6-2007	-	-	-	200	2.42	484	300	-	720

$$1. \left(\frac{400 + 720}{200 + 300} \right) = 2.24$$

$$2. \left(\frac{560 + 650}{250 + 250} \right) = 2.42$$

D. Inflated price method :

There are some materials which are subjected to natural wastage. In such cases, the materials are issued at an inflated price (a price higher than the actual cost) So as to recover the cost of natural wastage of materials from the production. For Ex. materials lost due to loading and unloading.

E. Specific price method :

Under this method materials issued to production are priced at their purchase prices. The basic assumption in following this method is that materials in the stores are capable of being identified as belonging the specific lots. Identification can be made by placing some distinguishing mark usually price tag on every lot. When materials are issued price tags are removed and forwarded to the costing department for ascertaining the material cost of production.

Merits :

1. This method is simple in its mechanism and operation.
2. This method does not create accounting complications.

3. This method is useful where job costing is in operation.
4. It is suited to the needs of a small business enterprises.

F. Base stock Method :

Each concern always maintains a minimum quantity of material in stock. This minimum quantity is known as safety or base stock and this should be used only when an emergency arises. The base stock is created out of the first lot of the material purchased and therefore, it is always valued at the cost price of the first lot and is carried forward as a fixed asset.

This method is generally used with FIFO or LIFO method. Any quantity over and above the base stock is issued in accordance with the other method which is used in conjunction with this method. The objective of this method is to issue the method according to the current prices.

Merits :

1. It is easy to estimate value of closing stock.
2. This method is easy to understand and simple to operate.

Demerits :

1. Value of closing stock should not reflect market price.
2. Inventory at low cost is showed in balance sheet.

Illustration 6 :

From the following information prepare stores ledger accounts following FIFO and LIFO methods keeping 1,000 units as base stock.

- 1- 4 - 2008 stock of material 4000 units at Rs 5 each
- 2- 4 - 2008 Purchased units 1000 at Rs. 5.50 each
- 6- 4 - 2008 Issued 4000 units
- 10- 4 - 2008 Purchased 6000 units at Rs. 6.00 each
- 15- 4 - 2008 Issued 5000 units
- 20- 4 - 2008 purchased 5000 units at Rs. 6.50 each
- 25- 4 - 2008 Issued 6000 units
- 27- 4 - 2008 purchased 8000 units at Rs. 7.00 each
- 30- 4 - 2008 Issued 5000 units

STORES LEDGER ACCOUNT

FIFO

Base stock - 1,000 units

DATE	PURCHASES			ISSUES			BALANCE		
	Quantity	Price Rs	Amount Rs.	Quantity	Price Rs	Amount Rs.	Quantity	Price Rs	Amount Rs.
1-4-2008	-	-	-	-	-	-	4000	5.00	20000
2-4-2008	1000	5.50	5500	-	-	-	4000 1000	5.00 5.50	20000 5500
6-4-2008	-	-	-	3000 1000	5.00 5.50	15000 5500	1000	5.00	5000
10-4-2008	6000	6.00	36000	-	-	-	1000 6000	5.00 6.00	5000 36000
15-4-2008	-	-	-	5000	6.00	30000	1000 1000	5.00 6.00	5000 6000
20-4-2008	5000	6.50	32500	-	-	-	1000 1000 5000	5.00 6.00 6.50	5000 6000 32500
25-4-2008	-	-	-	6000	1000 x 6.00 5000 x 6.50	6000 32500	1000	5.00	5000
27-4-2008	8000	7.00	56000	-	-	-	1000 8000	5.00 7.00	5000 56000
30-4-2008	-	-	-	5000	7.00	35000	1000 3000	5.00 7.00	5000 21000

STORES LEDGER ACCOUNT

LIFO

Base stock - 1,000 units

DATE	PURCHASES			ISSUES			BALANCE		
	Quantity	Rate Rs	Amount Rs.	Quantity	Rate Rs	Amount Rs.	Quantity	Rate Rs	Amount Rs.
1-4-2008	-	-	-	-	-	-	4000	5.00	20000
2-4-2008	1000	5.50	5500	-	-	-	4000 1000	5.00 5.50	20000 5500
6-4-2008	-	-	-	1000 3000	5.50 5.00	5500 15000	1000	5.00	5500
10-4-2008	6000	6.00	36000	-	-	-	1000 6000	5.00 6.00	5000 36000
15-4-2008	-	-	-	5000	6.00	30000	1000 1000	5.00 6.00	5000 6000
20-4-2008	5000	6.50	32500	-	-	-	1000 1000 5000	5.00 6.00 6.50	5000 6000 32500
25-4-2008	-	-	-	-	5000 1000	6.50 6.00	1000	5.00	5000
27-4-2008	8000	7.00	56000	-	-	-	1000 8000	5.00 7.00	5000 56000
30-4-2008	-	-	-	5000	7.00	35000	1000 3000	5.00 7.00	5000 21000

G. Highest in first out method :

This method is based on the assumption that the closing stock of materials should always remain at the minimum value, so the issues are priced at the highest value of the available consignments in the store. This method is not popular as it always under values the stock which amounts to creating a secret reserve.

H. Market Price method :

Market price can either be the replacement price or the realisable price. The replacement price is used in case of the items which are held in stock for use in production while realisable price is used in respect of the items which are kept in stock for sale. Under this method, materials are issued at a price at which they can be replaced. Therefore cost of the materials issued is not considered but materials are issued at the market price prevailing on the date of issue.

Merits :

1. This method is considered to be the best method where quotations have to be sent because quotations sent would reflect the latest competitive conditions.
2. This method discloses whether the buying is efficient or in efficient.

Demerits :

1. This method does not recover cost price of the material from production because materials are issued at the market price which may be more or less than the cost price.
2. It makes stores ledger complicated by introducing the element of profit or loss.

I. Standard price method :

Standard price is the predetermined price and both the receipts and issues will be valued at this price. This method is used by concerns which follow standard costing.

Merits :

1. This method is easy to operate.
2. Material price variance can be used as a management tool for control of material cost.

Demerits :

1. The standard price does not recover the costs of material.
2. It creates problems of material price variance and stock adjustment.

Pricing of returns :

1. The returned material is valued at the original price at which it was issued
OR
2. The returned material is priced at the rate at which any materials requisition placed on that date would have been priced.

3.4 INVENTORY CONTROL :

Inventory control is the system devised and adopted for controlling investment in inventory. It includes control over raw materials stores, supplies, spare parts, tools, components, work in process and finished goods. Inventory control is a system which ensures the provision of the required quantity of inventories of the required quality at the required time with the minimum amount of capital. The function of inventory control is to obtain the maximum inventory turnover with sufficient stock to meet all requirements. The main objectives of inventory control are as follows.

Objectives of inventory control :

1. Maintaining adequate inventory so as to avoid production heldup leading to customer dissatisfaction, loss of revenue etc.
2. Avoiding excessive investment in inventory.
3. Relieving management in taking inventory decisions for each and every item of inventory.
4. Supervising the stores inventory subsidiary ledgers.
5. Maintaining up - to - date price record of all items.
6. Preparing material abstract.

Methods of Inventory control :

The common methods adopted for inventory control are -

- i. Periodical inventory control method.
- ii. Perpetual inventory control method.
- iii ABC analysis.

i. Periodical inventory control method :

In this method the stock is verified at the end of the stipulated period by stock taking committee constituted by the top management it consists the members drawn from different departments of the company and its term is temporary. Committee physically counts, weights, measures the stock in stores and gives the report to the management.

ii. Perpetual inventory control method :

The perpetual inventory system is a method of recording stores balances after each receipt and issue, to facilitate regular checking and to obviate closing down of work for stock taking. In order to ensure accuracy of perpetual inventory records, physical stocks should be checked. Thus an essential feature of the perpetual inventory system is the continuous checking of stock. The use of Tag system is a common arrangement for recording units counted.

Actual stock of material may differ from card or stores ledger balances on account of avoidable causes and unavoidable causes.

A. Avoidable causes :

- i. Errors in posting or calculation of receipts, issues or balances on bin cards or on stores Ledger accounts.
- ii. Pilferages and breakages.
- iii. Entering transactions in the wrong bin card or in the wrong stores ledger account.
- iv. Goods received and deposited in wrong bins, wrong issues, over - issues or under issues.

B. Un Avoidable causes :

- i. Shrinkage and evaporation .
- ii. Losses arising out of breaking up bulk material for issue as in sawing wood, loss in pouring liquid etc.
- iii. Climatic conditions causing deterioration eg., absorption, crumbling.
- iv. Small defective units e.g. bolts and screws.
- v. Materials purchased by weight but issued in quantities.

The maintenance of a satisfactory perpetual inventory records has the following advantages-

- i. It obviates the need for the physical checking of all stocks at the year end.
- ii. A detailed reliable check on the stores is obtained.
- iii. It avoids the dislocation of production which arises when the stocks are checked at one time.
- iv. Errors, Irregularities and loss of stock are readily discovered. It helps in preventing a recurrence in future.
- v. As the work is carried out systematically and without undue haste, the figures are generally reliable.
- vi. The disadvantages of excess stocks are avoided and capital tied up in stores materials cannot exceed the target.

iii ABC analysis :

ABC analysis intends to concentrate on these items which are considered precious and require effective control on selective items only. Usually the materials used in an organisation are grouped into three categories A, B and C items under A category would be of high value, those under B would be of medium value and under C category would be of low value.

ABC analysis measures the cost significance of each item of material. It concentrates on important items. So it is also known as control by importance and exception (C.I.E.) The significance of this analysis is that a very close control is exercised over the items of A group

which account for a high percentage of costs while less stringent control is adequate for category B and very little control would suffice for category C items.

Advantages :

1. A strict control is exercised on the items which represent a high percentage of the material costs.
2. Investment in inventory is reduced to the minimum possible level because a reasonable quantity of A items representing a significant portion of the material costs is purchased.
3. Storage cost is reduced as a reasonable quantity of materials, which account for high percentage of value of consumption will be maintained in the stores.

3.5 CONCLUSION :

Thus the fixation of the price at which issues of materials are to be charged to production is an important one from the point of view of cost accounting. There are numerous factors to be taken into account in pricing the materials issued to production. Where purchase prices remain constant for a long period, there is little difficulty in correct accounting for materials in practice we find that prices of materials fluctuate on account of changes in the value of money, changes in world commodity prices, buying from different sources and differences in quantity discounts. Under these circumstances it may be observed that there may be a number of identical articles bought at different prices. While issuing these articles it is essential to consider the price at which it should be charged to production. There are various methods in use with attendant advantages and disadvantages from the point of view of both convenience and accounting aspects.

3.6 SELF ASSESSMENT QUESTIONS :

Five Marks Questions :

1. What is bin card ? What are its uses ?
2. Explain stores ledger
3. Differentiate bin card from stores ledger
4. What is base stock method.

Ten Marks Questions :

1. Explain FIFO and LIFO methods of material issues.
2. How to fix prices to issue of material under average cost method ?
3. What are merits and demerits of market price method.
4. Explain ABC analysis.

Twenty Marks Questions :

1. Explain briefly various methods of valuation of material issues.
2. What are the methods of inventory control.
3. Show the stores ledger entries as they would appear when using FIFO and LIFO methods of pricing the issues.

1- 4 - 2008 Balance 300 units value Rs. 600

2- 4 - 2008 Purchased 200 units, value Rs. 440

4- 4 - 2008 Issued 150 units

6- 4 - 2008 Purchased 200 units , value Rs. 460

17- 4 - 2008 Issued 150 units

19- 4 - 2008 Issued 200 units

22- 4 - 2008 Purchased 200 units, value Rs. 480

29- 4- 2008 Issued 250 units

Ans - [Stock Value - FIFO 360 ; LIFO 300]

4. Prepare a stores ledger account showing the receipts and issues under FIFO and LIFO methods.

Date	Quantity	Rate per unit	Purchase/ Issue
1-5-2008	200	20.00	Purchase
4-5-2008	100	-	Issued
10-5-2008	50	-	Issued
18-5-2008	309	18.00	Purchase
20-5-2008	250	-	Issued
30-5-2008	100	16.00	Purchase
31-5-2008	100	-	Issued

5. Prepare stores ledger accounts by using FIFO and LIFO methods.

4- 1 - 2008 500 metres of type M at Rs 20 per metre

7- 1 - 2008 800 metres of type N at Rs 30 per metre

9- 1 - 2008 1150 metres of type M at Rs 24 per metre

17- 1 - 2008 1500 metres of type N at Rs 32 per metre

26- 1 - 2008 400 metres of type M at Rs 19 per metre

Issues were as follows :

8- 1 - 2008 350 metres of M

12- 1 - 2008 600 metres of N

28- 1 - 2008 710 metres of M

29- 1 - 2008 1430 metres of N

31- 1 - 2008 790 metres of M

Ans - FIFO - M - 3,800 N- 8640

LIFO - M - 4,200 N- 8240

6. From the following prepare stores ledger A/C by LIFO method.

Jan 2 Purchased 4000 units at Rs. 4 per unit

Jan 20 Issued 500 units at Rs. 5 per unit.

Feb 5 Issued 2000 units

Feb 10 Purchased 6000 units at Rs. 6.00 per unit

Feb 12 Issued 4000 units

March 2 Issued 1000 units

March 5 Issued 2000 units

March 15 Purchased 4500 units at Rs. 5.50 per unit

March 20 Issued 3000 units

Ans - 14,250

7. Prepare stores ledger A/C by base stock method when it operates in conjunction with FIFO and LIFO methods. Base stock is 200 units.

2007 Dec, 1 Purchased 500 tonnes at Rs. 2.00 per ton

2007 Dec, 10 Purchased 300 units at Rs. 2.10 per ton

2007 Dec, 15 Issued 600 tonnes

2007 Dec, 20 Purchased 400 units at Rs. 2.20 per ton

2007 Dec, 25 Issued 300 tonnes

2007 Dec, 27 Purchased 500 units at Rs. 2.10 per ton

2007 Dec, 31 Issued 200 tonnes

8. Following transactions took place in the month of March :

Date	Receipts kgs	Rate Rs.	Issue Kgs.
2007 Dec, 2	200	2.00	-
2007 Dec, 10	300	2.40	-
2007 Dec, 15	-	-	250
2007 Dec, 18	250	2.60	-
2007 Dec, 20	-	-	200

Stock verifier reported a loss of 50 kg on 15th March. Prepare stores ledger A/C by simple average and weighted average methods.

Ans - SAM - 250 Kgs - Rs 600

WAM - 250 Kgs - Rs 614

9. Prepare stores ledger by adopting simple average method and weighted average method.

2008 Jan 1 Balance 500 units at Rs. 25 per unit

2008 Jan 3 Issues 250 units

2008 Jan 10 Purchases 200 units at Rs. 26 per unit

2008 Jan 12 Returns from a work order 15 units at Rs. 24 per unit

2008 Jan 15 Issues 180 units

2008 Jan 16 stock verification reveals a loss of 5 units.

2008 Jan 20 Purchases 320 units at Rs. 30 per unit

2008 Jan 28 stock verification reveals a loss of 8 units.

2008 Jan 30 Issues 112 units

Ans - SAM - 430 units, Value Rs 13,635

WAM - 430 units, Value Rs 12,623

10. XYZ Ltd. has purchased and issued the material 'Q' in the following order.

2007		Units	Unit cost
Dec, 1	Purchase	300	3
Dec, 4	Purchase	600	4
Dec, 6	Issue	400	-
Dec, 10	Purchase	600	4
Dec, 15	Issue	1000	-
Dec, 20	Purchase	400	5
Dec, 23	Issue	200	-

Which of the methods of pricing issue of materials would you recommend in the above case ? Ascertain the quantity of closing stock as on 31st December and state what will be its value in each case if issues are made under the

1. Method recommended by you
2. Weighted average cost.

3.7 BOOKS RECOMMENDED :

1. Cost & Management Accounting - S.P. Jain & K.L. Narang
2. Practivcal costing - Khanna ; Pandey ; Ahuja.
3. Cost Accounting - S.P. Jain & K.L. Narang
4. Cost Accounting - Rudra Saibaba.

Dr. K. Kanaka Durga

Lesson - 4

LABOUR COST - CONTROL

OBJECTIVES:

After studying this lesson you should be able to understand -

- What is labour
- What are the types of labour
- How to control the labour cost
- Role of different departments in control of labour cost.
- Wage payment methods.

STRUCTURE:

4.1 Introduction

4.2 Types of material

4.3 Material Control

4.4 Control over labour costs

4.4.1 Personnel Department

4.4.2 Engineering Department

4.4.3 Time and Motion study Department

4.4.4 Time Keeping

4.4.5 Time booking

4.5 Idle time

4.6 Over time

4.7 Wage payment methods

4.7.1 Essentials of a good wage payment methods

4.7.2 Time wage method

4.7.3 Piece wage method

4.8 Conclusion

4.9 Self Assessment Questions

4.10 Books Recommended

4.1 INTRODUCTION:

Labour cost is a second major element of cost. Remuneration paid to labour is called labour cost or wages. Proper control and accounting for labour cost is one of the most important problems of a business enterprise. Labour can be divided into direct labour and indirect labour. Direct labour is that labour which is directly engaged in the production of goods and services. Payment of direct labour is a part of prime cost whereas payment of indirect labour is an item of indirect expenses. Since labour cost constitutes a significant portion of the total cost of a product, economic utilisation of labour is a need of the present day industry to reduce the cost of production. Control of labour cost depends upon the co-operation of every member of the supervisory force from the top executive to foremen. A high labour turnover increases cost of production. With the help of some techniques such as motion study, time study, job analysis, time keeping, time booking cost of production can be reduced. Idletime should be reduced to control cost. Overtime work should be avoided because job done in overtime costs more as compared to the job done during normal time.

4.2 TYPES OF LABOUR:

Labour refers to the part of human effort by which raw materials are shaped into finished goods. Labour cost is classified as direct labour cost and indirect labour cost.

a. Direct Labour :

Direct labour cost is that cost which can be conveniently allocated to a particular job, product or process for example labour engaged in making the bricks in a kiln is direct labour because labour charges paid for making 10,000 bricks can be conveniently allocated to the cost of 10,000 bricks. Payment of direct labour is a direct expenditure and is a part of prime cost.

b. Indirect Labour :

Indirect Labour is that labour which is not directly engaged in the production of goods and services but which indirectly helps the direct labour engaged in production. The cost of indirect labour can not be conveniently allocated to a particular job, order, process or article. Payment of indirect labour is an item of indirect expenditure and is shown as works, office selling & distribution expenditure according to the nature of the time spent by the indirect worker. The indirect workers are mechanics, supervisor, chowkidars, sweepers, foremen, watchmen, time keeper, cleaners, repairers etc.,.

4.3 LABOUR COSTS :

Labour costs include various items of expenditure incurred on workers towards monetary benefits and fringe benefits.

- A. **Monetary Benefits** : Examples - Basic pay, Dearness pay, Employer's contribution to provident fund and state insurance scheme, production bonus, profit Bonus pension and gratuity.
- B. **Fringe Benefits** : Examples - Subsidised food, subsidised housing, subsidised education to the children of the workers, medical facilities, recreation facilities etc.,.

4.4 CONTROL OVER LABOUR COSTS :

Labour costs constitute a significant portion of the total cost of a product. Labour cost may increase due to inefficiency of labour, more wastage of materials by labour due to lack of proper supervision, high labour turnover, idle time and unusual overtime work etc,. Therefore, economic utilisation of labour is a need of the industry to reduce cost of production management is interested in labour costs on account of the following causes -

- i. to use direct labour cost as a basis for increasing the efficiency of workers.
- ii. to identify direct labour cost with product for ascertaining the cost of every product.
- iii. to use direct labour cost as a basis for absorption of overhead.
- iv. to determine indirect labour cost to be treated as overhead.

Hence control of labour costs is an important objective of management. To reach the object management seeks the cooperation of every member of the organisation. Following six departments contribute much to control labour cost.

1. Personal Department
2. Engineering Department
3. Time and Motion study Department
4. Time keeping Department
5. Cost Accounting Department
6. Pay - roll Department

4.4.1 Personal Department :

Personal department is responsible for the implementation of managerial decisions regarding recruitment training and placement of employees. Proper planning of this process helps the management to take steps to improve the working conditions so that there may not be frequent changes in the labour force. Mechanisation of operations should be considered if it is helpful in reducing labour costs. One of the important functions of the personal department is handling labour turnover.

4.4.1.1 Labour Turn over :

Labour turnover denotes the percentage change in the labour force of an organisation. High percentage of labour turnover denotes that labour is not stable and there are frequent changes in the labour force because of new workers engaged and workers who have left the organisation. A high labour turnover is not desirable. Labour turnover is assessed according to replacement method with the help of following principle.

$$\text{Labour Turnover} = \frac{\text{Number of workers replaced during a period}}{\text{Average number of workers during the period}} \times 100$$

4.4.1.2 Causes of labour turnover :

Causes of labour turnover can be divided into three heads they are

- a) Personal causes
- b) Un avoidable causes
- c) Avoidable causes.

a. **Personal Causes** : Workers may leave the organisation on personal grounds such as-

- 1. Retirement
- 2. Domestic problems
- 3. Accident making workers permanently incapable of doing work.
- 4. Women workers may leave after marriage
- 5. Dislike for the job
- 6. Death.
- 7. Finding better jobs at some other places

In all these cases turnover is unavoidable.

b. **Unavoidable causes** : In some circumstances it becomes necessary for the management to ask some of the workers to leave the organisation for instance.

- 1. Workers may be discharged due to Insubordination or inefficiency
- 2. Workers may be discharged due to continued or long absence.
- 3. Workers may retrenched due to shortage of work

c. **Avoidable causes** : Low wages and allowances may induce workers to leave the factory and join other factories where higher wages and allowances are paid. Other causes are -

- 1. Unsatisfactory working conditions
- 2. Job dissatisfaction on account of wrong placement of workers.
- 3. Lack of fringe benefits
- 4. Long hours of work
- 5. Lack of promotion opportunities
- 6. Unsympathetic attitude of the management.

The personnel department should prepare periodical reports on the labour turnover listing out the various reasons due to which workers have left the organisation. The report should be sent to the management with the necessary recommendations so that corrective measures may be taken to reduce labour turnover.

4.4.2 Engineering Department :

This department is required to maintain control over working conditions and production methods for each job by preparing specifications for each job, inspecting and maintaining safety working conditions.

4.4.3 Time and Motion study department :

This department performs following functions to reduce cost of labour.

1. Motion study
2. Time study
3. Job analysis.

1. **Motion study** : The determination of the best way of performing an operation is made possible by motion study. It is a study of the movements of a worker or a machine in performing an operation for the purpose of eliminating useless movements in order to improve productivity.

Advantages :

1. the efficiency of workers is increased
 2. It helps in simplifying the existing operations
 3. It leads to economy in labour cost.
2. **Time study** : Time study may be defined as the art of observing and recording the time required to do each detailed element of an industrial operation. The main object of this study is to determine the proper time required to complete the job. Such study is conducted after the motion study because time is to be noted down for the necessary movement, which are decided by motion study.

Advantages :

1. the efficiency of workers is increased
2. the labour requirements are correctly assessed because standard time for various jobs are known.
3. The study facilitate budgeting of labour costs.
4. Time study helps in reduction of cost through proper production control.

3. **Job analysis** : Job analysis is the ranking, grading and weighing of all work characteristics i.e skill, effort, responsibility etc, of all jobs and is concerned with putting money values on them. Thus job analysis is the complete study of the job.

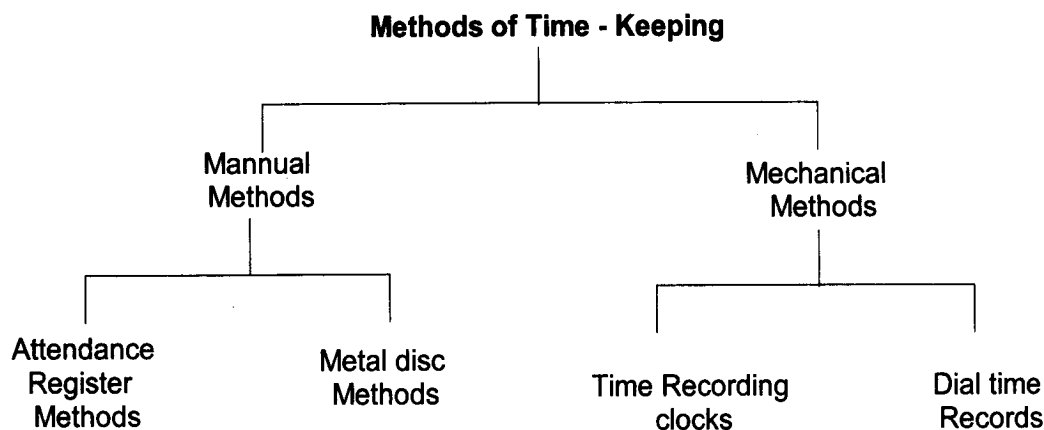
4.4.4 Time keeping :

Time keeping is concerned with the recording of time of workers for the purpose of attendance and wage calculations. It serve the following purposes -

1. preparation of pay rolls in case of time paid worker.
2. meeting the statutory requirements.
3. ensuring discipline in attendance
4. recording of each workers time
5. time keeping is useful for overhead distribution.

4.4.4.1 Methods of Time - keeping :

The methods of time - keeping may be either manual or mechanical. The selection of a particular method depends upon the requirements and policy of a firm.



I. Manual Methods : The manual methods of time keeping are as following -

- a. **Attendance Register Method** : It is the oldest method of recording time. Under this method, an attendance register or Muster Roll is kept in the time office adjacent to the factory gate or in each department. The attendance register contains such columns as the name of the worker, number of the worker, the name of the department, the rate wage, the time of arrival and departure, normal time, over time. The time of arrival and departure, may be noted down by an employee known as time keeper

Merits :

1. This method is simple and inexpensive
2. It is useful in small firms where number of workers is not large.
3. This method is suitable for the recording time of the worker who work at customer's premises which are situated at a distance from the factory.

Demerits :

1. This method may lead to dishonest practice of recording wrong time because there is possibility of collusion between some of the workers and the time keeper.
 2. It is not suitable to industries where number of workers is large.
- b. **Metal Disc Method :** Under this method, each worker is allotted a metal disc or a token with a hole bearing his identification number. A board is kept at the gate with pegs on it and all tokens are hung on this board. As the workers enter the factory gate, they remove their respective discs or tokens and place them in a box or tray kept near the board. After scheduled time the box is removed and the late comers will have to give their tokens to the time - keeper personally so that the exact time of their arrival could be recorded. The discs left on the board represent the absentee workers.

Merits :

1. This method is simple
2. Illiterate workers also easily understand the procedure
3. This method is useful when the number of employees is not large.

Demerits :

1. There are chances that a worker may try to remove his companion's token from the board in order to get his presence marked when he is absent.
2. There are chances of disputes regarding the exact time of arrival of a worker.
3. There is no authentic proof of the presence or absence of the workers.
4. There are chances of inclusion of dummy workers.

II. Mechanical Methods : The Mechanical methods of time keeping are time recording clocks and dial time records.

- a. **Time Recording Clocks :** The time recording clock is a mechanical device which automatically records the time of the workers. Under this method each worker is given a time card usually of one week duration. Time cards are serially arranged in a tray near the factory gate and as the worker enters the gate. He picks up his card from the tray, puts it in the time recording clock which prints the exact time of arrival in the proper

space against the particular day. The process is repeated for recording time of departure for lunch, return from lunch and time of leaving the factory in the evening. Late arrivals, early leavings and overtime are printed in red to attract the attention of the management

Merits :

1. This method is useful when the number of workers is large.
2. There are no chances of disputes arising in connection with recording of time of worker because time is recorded by the time recording clock.
3. There is no scope for partiality or carelessness of the time keeper as in case of manual methods.

Demerits :

1. There are chances that a worker may try to get his friend's time card in order to get him marked present, when his friend is late or absent.
 2. Some times, the time recording clock goes out of order and the work of recording of time is dislocated.
- b. **Dial Time Records** : The dial time recorder is a machine which has a dial around the clock. This dial has a number of holes and each hole bears a number corresponding to the identification number of the worker concerned. There is one radial arm at the centre of the dial. As a worker enters the factory gate, he is to press the radial arm after placing it at the hole of his number and his time will automatically be recorded on a roll of paper inside the dial time recorder against the number. The sheet on which the time is recorded provides a running account of the workers' time.

Merits :

1. This machine allows greater accuracy and can itself transcribe the number of hours to the wage sheets.
2. This machine can also calculate the wages of the workers and thus avoids much loss of time.

Demerits :

1. It requires high installation cost.
2. It is useful only when the number of workers is limited.

4.4.5 Time Booking :

Time booking is the recording of time spent by the worker on different jobs or work orders carried out by him during his period of attendance in the factory. Following are the objects of time booking.

1. To ascertain the labour cost.
2. To calculate idle time
3. To assess bonus payment
4. To provide base for the apportionment of over head expenses.
5. To know the efficiency of workers.

4.4.5.1 Methods of Time - booking :

Following documents are generally used for time booking -

- a) Daily time sheets
 - b) Weekly time sheets
 - c) Job tickets or job cards.
- a. **Dial Time sheets** : This sheet is a daily record of the work done by a worker on different jobs. The worker completes the sheet every day and gives it to the foreman for signature to ensure the correctness of the sheet.

Demerits :

1. Use of daily time sheets are suitable only to small organisations.
 2. Use of new time sheets daily, incurs large amount of expenditure.
- b. **Weekly time sheet** : This sheet is a weekly record of the workdone by a worker on different jobs. This sheet is an improvement over the daily time sheet.

Demerits :

1. There are chances of these sheets being lost or mutilated because they are continuously left in the hands of the workers for a long period of one week.
- c. **Job tickets or Job cards** : A job card is used to keep a close watch on the time spent by a worker on each job so that the labour cost of a job may be conveniently ascertained. Four types of job cards, are generally used namely.
- i. Combined time and job cards.
 - ii. Job card for each worker
 - iii. Job card for each job
 - iv. Piece work card.

Merits :

1. A reconciliation is possible between the time showed and time booked against job.
2. Labour cost can be easily assessed.

Demerits :

1. This method is not suitable when the number of workers is large.
2. It is not possible to assess idle time.

4.5 IDEAL TIME :

The difference between the time booked to different jobs or work orders and gate time is known as idle time. Idle time is that time for which the employer pays, but from which he obtains no production. Idle time is of two types -

1. Normal idle time
2. Abnormal idle time.

1. **Normal idle time** : Normal idle time represents the wastage of time which cannot be avoided. therefore, the employer must bear the labour cost of this time. Following are some of the examples of normal idle time.

1. The time taken in going from the factory gate to the work place and coming from the work place to factory gate.
2. The time taken in picking up the work for the day.
3. The time taken between two jobs.
4. The time taken for personal needs and tea breaks.

Treatment of cost of Normal idle time : Since it is unavoidable cost and as such should be included in cost of production. It is treated as an item of factory expenses and recovered as an indirect charge, or it may be charged direct to production at a grossed - up rate to include normal idle time.

2. **Abnormal idle time** : It is that time the wastage of which can be avoided if proper precautions are taken. Following are examples of abnormal idle time.

1. The time wasted due to breakdown of machinery on account of the inefficiency of the works engineers.
2. The time wasted on account of the failure of the power supply.
3. The time wasted due to shortage of material
4. The time wasted due to strikes or lock - outs in the factory.

Treatment of cost of Abnormal idle time : The wages paid for abnormal idle time should be debited to costing profit and loss account.

4.6 OVER TIME :

Usually the workers are supposed to work for a given time per day or per week. It is called the normal work period whereas overtime is the work done beyond the normal work period. In India, according to the factories Act overtime wages should be paid at double the usual rate of wages. If a worker works for more than 9 hours on any day or for more than 48 hours in a week, he is treated to be engaged on overtime and is given wages at double the basic hourly rate for the overtime put in by him. Double rate for overtime is paid to give incentive for late hours. The additional amount paid on account of overtime is known as overtime premium.

Overtime work should be avoided because jobs done in overtime cost more as compared to the jobs done during normal hours.

Treatment of overtime premium :

Normal wages are grossed up to allow for overtime premium and, therefore, each job, whether done in normal time or overtime is charged at the same rate of wages. This method of treatment of overtime is suitable when the sequence of jobs is a matter almost of chance, but if overtime is needed in case of a rush job at customers' request so as to complete it within a particular time, it is proper to charge the overtime premium to the cost of the rush job.

Where however overtime arises due to any abnormal reason such as break down of machinery or failure of power, overtime premium is excluded from the cost of production and is debited to the costing profit and loss account.

4.7 WAGE PAYMENT METHODS :

The amount of wages payable to the workers determines their attitude towards their work and the employer. On the other hand, the employers try to keep down the labour cost and try to pay less. To solve this problem the method of wage payment adopted should be such which reduces labour cost per unit and at the same time workers are paid reasonably for their work.

4.7.1 Essentials of a good wage system :

A wage system will be treated as fair if it has the following features -

- a. The system should be fair both to the employer and the employee.
- b. The worker should be assured of a guaranteed minimum wage at satisfactory level.
- c. Workers should be paid according to their skills.
- d. The system should ensure equal pay for equal work.
- e. The system should be flexible.
- f. The system should be simple and capable of being understood by the workers.
- g. The system should ultimately result into higher production.

There are two principal wage systems such as -

1. Payment on the basis of time spend in the factory - Time wage system
2. Payment on the basis of work done - Piece rate system

4.7.2 Time wage system :

Under this method of wage payment, the worker is paid at an hourly daily, weekly or monthly rate. Payment is made according to the time worked irrespective of the quantity of work done. This method of wage payment is most suitable for the highly skilled and the unskilled workers including apprentices. The principle to calculate wage under this method is -

$$\text{Wage} = \text{Time} \times \text{Rate per hour} .$$

This method is also suitable for the following types of work :

1. Where goods are in artistic nature
2. When the production is automatic
3. Where output cannot be measured Ex: repair work
4. Where close supervision is possible.

Merits :

1. Time wage method is easy and simple to follow
2. Under this method worker is assured payment of wage for the time spent by the worker.
3. Under this method material wastage can be reduced.

Demerits :

1. Workers are not paid according to skills.
2. Efficient workers will become inefficient workers because they notice that inefficient workers also get the same wages.
3. Management is forced to pay for idle time also.
4. It will encourage a tendency among workers to go slow so as to earn overtime wages.

Example : From the following information calculate wages of a worker under time wage system.

Rate per hour - Rs 50

Time required to complete a job - 10 hours

Ans -

Rate per hour - Rs 50

Time required to complete a job - 10 hours

$$\text{Wage} = T \times R = 10 \times 50 = \text{Rs. } 500.$$

4.7.3 Piece wage system :

According to piece wage system wage is paid on the basis of work completed. A fixed rate is paid for each unit produced, job completed or an operation performed. An equitable piece work rate should be fixed to give an inducement to the workers to produce more. Rate can be fixed with the help of time and motion study and job analysis. Different piece rates should be determined for different types of jobs. Principle to calculate piece wage is -

$$\text{Wage} = \text{Work done} \times \text{Rate per piece}$$

or

$$\text{Wage} = \text{Time taken} \times \text{Rate per hour.}$$

This method is suitable in the following conditions :

1. When the close supervision is not possible
2. When the production is on large scale.
3. Where output can be measured.
4. Where the work is repetitive nature.

Merits :

1. Workers are paid according to skills
2. An inducement is given to the workers to increase their production.
3. The employer is able to know his exact labour cost per unit.
4. Idle time is not paid.

Demerits :

1. Low piece rate will frustrate the workers.
2. The quality of output will suffer because workers will try to produce more to earn more wages.
3. There may not be an effective use of material, due to the efforts of workers to increase the production.
4. Cost of production may increase due to more wastage of material.
5. Workers have the fear of losing wages because of no guaranteed wage.
6. The system will cause discontentment among the slower workers because they are not able to earn more wages.

Example :

Rate per hour - Rs 3.

Time allotted to produce a product = 15 minutes

In an 8 hours day 'P' produced 36 products, Q produced 30 products. Calculate their wages under piece wage method.

Ans - Wage per hour = Rs. 3.

Time to produce one product = 15 minutes.

Production per hour = 15 - 1

60 - 1

$$= \frac{60 \times 1}{15} = 4$$

Wage per product = 4 - 3

1 - ?

$$= \frac{3.00}{4} = 0.75$$

'P' Production = 36 units

wage = 36 x 0.75

= Rs. 27

Q production = 30 units

= 30 x 0.75

= Rs. 22.50

4.8 CONCLUSION :

Thus the labour cost, its control and computation are very significant in the cost of production of a product. Labour cost may be more due to inefficiency of labour, wastage of material by labour, high labour turnover, idletime and unusual overtime work, inclusion of bogus workers in the wage sheet etc,. Hence control of labour cost is an important objective of management. With the co-ordination of various departments labour cost can be controlled to a large extent. If labour cost is controlled it leads reduction in cost of production which ultimately leads reduction of price in the market and increase the demand.

4.9 SELF ASSESSMENT QUESTIONS :**Five Marks Questions :**

1. What is labour, what are the types of labour
2. Explain Time study
3. Describe Motion study
4. What is job analysis
5. What is meant by over time.

Ten Marks Questions :

1. Explain labour turnover
2. What is meant by idle time
3. What is Time booking
4. What are essentials of good wage system.

Twenty Marks Questions :

1. Explain briefly how to control labour costs.
2. What are the merits and demerits of Time keeping.
3. Explain wage payment methods.

4.10 BOOKS RECOMMENDED :

1. Cost & Management Accounting - S.P. Jain & K.L. Narang
2. Cost Accounting - S.P. Jain & K.L. Narang
3. Cost Accounting - S.P Gupta
4. Cost Accounting - N.K. Prasad

Dr. K. Kanaka Durga

Lesson - 5

METHODS OF PAYMENT OF INCENTIVES (Labour Incentive Schemes)

5.0 OBJECTIVES:

After studying this lesson you should be able to understand the following

- Features of incentive schemes
- Methods of payment of incentives

STRUCTURE:

- 5.1 Introduction**
- 5.2 Features of incentive schemes**
- 5.3 Method of payment of incentives**
- 5.4 Solved Problems**
- 5.5 Self Assessment Questions**
- 5.6 Books Recommended**

5.1 INTRODUCTION:

Incentive or Bonus means money or an equivalent given in addition to an employee's usual compensation. The objective of an incentive plan is to increase the production by giving an inducement to the workers in the form of higher wages for less time worked. This system of wage payment is in between the time wage system and piece wage system. In time wage system worker does not get any reward for the time saved and in piece work system, the worker gets full payment for the time saved, whereas in a premium plan, both the worker and the employer share the labour cost of the time saved. The employer is able to save wages for a proportion of the time saved and on the other hand the worker is able to get extra wages for a fraction of the time saved. The incentive scheme is also known as bonus scheme because a worker has the incentive to earn more wages by completing the work in less time.

The procedure of payment of incentive is standard time is fixed for the completion of a specified job or operation and the worker is paid for the time taken by him to complete the job or operation at an hourly rate plus wages for a certain fraction of the time saved on the standard by way of a bonus.

5.2 FEATURES OF INCENTIVE SCHEMES :

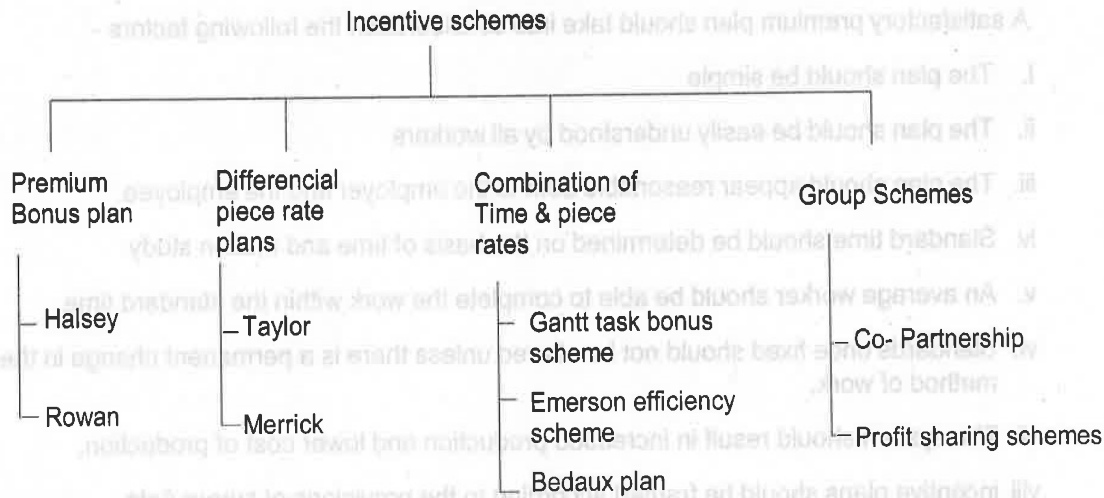
A satisfactory premium plan should take into consideration the following factors -

- i. The plan should be simple
- ii. The plan should be easily understood by all workers
- iii. The plan should appear reasonable both to the employer and the employee.
- iv. Standard time should be determined on the basis of time and motion study.
- v. An average worker should be able to complete the work within the standard time.
- vi. Standards once fixed should not be altered unless there is a permanent change in the method of work.
- vii. The system should result in increased production and lower cost of production.
- viii. Incentive plans should be framed according to the provisions of labour Acts.

5.3 METHODS OF PAYMENT OF INCENTIVES :

Incentive schemes can be classified into four categories such as -

1. Premium Bonus plans
 - Halsey plan
 - Rowan plan
2. Differential piece rate plans - Taylor plan
 - Merrick plan
3. Bonus plans of combination of time and piece rates -
 - a. Gantt task bonus scheme
 - b. Emerson efficiency scheme
 - c. Bedaux plan.
4. Group bonus schemes
 - Co partnership
 - profit sharing schemes



5.3.1 Premium Bonus Plans :

- A. **Halsey premium plan** : Under this method standard time for doing each job or operation is fixed and the worker is given wages for the actual time he takes to complete the job or operation at the agreed rate per hour plus a bonus equal to one - half of the wages of the time saved. In practice the bonus may vary from 33 1/3 % to 66 2/3% of the wages of the time saved. Under Halsey plan the total earnings of a worker will be calculated with the help of the following principle.

$$\text{Total earnings} = T \times R + 50 \% (S - T) R$$

T = Time taken

S = Standard time

R = Rate per hour

% = The percentage of the wages of time saved to be given as bounds.

Illustration - 1

Standard time = 48 hours

Time taken = 44 hours

Rate per hour = Rs. 2.

From the above information calculate total earnings of a worker under Halsey scheme.

Total earnings = $T \times R + 50 \% (S - T) R$

$S = 48$ hours

$T = 44$ hours

$R = \text{Rs } 2.$

$$\text{Total earnings} = 44 \times 2 + \frac{50}{100} (48 - 44) \times 2$$

$$= 88 + \frac{50}{100} (4) \times 2$$

$$= 88 + (2 \times 2)$$

$$= \text{Rs } 92.$$

Halsey - weir plan : Under the Halsey - weir premium plan the premium is set at 30% of the time saved.

Advantages of Halsey premium plan :

- i. It is simple to understand and easy to operate
- ii. It guarantees time wages.
- iii. The wages of time saved are shared by both employers and workers.
- iv. Since this scheme provides incentive to efficient worker it makes distinction between efficient workers and inefficient workers.

Disadvantages of Halsey premium plan :

- i. Quality of work suffers because workers are in a hurry to save more and more time to get more bonus.
- ii. Workers criticise this method on the ground that the employer gets a share of wages of the time saved.

B. Rowan plan : Under this method, the worker is again guaranteed wages at the ordinary rate for the time taken by him to complete the job or operation. Bonus is calculated as the proportion of the wages of the time taken which the time saved bears to the standard time allowed. The principle to calculate the total earnings of the worker is -

$$\text{Total earnings} = T \times R + \frac{S - T}{S} \times T \times R$$

$T =$ Time taken

$R =$ Rate per hour

$S =$ Standard time

Illustration - 2

Standard time = 10 hours

Hourly rate = Re 1

Time taken = 6 hours

$$\text{Total earnings} = T \times R + \frac{S - T}{S} \times T \times R$$

T = 6 hours

R = Rate per hour i.e Re 1

S = 10 hours

$$\begin{aligned} \text{Total earnings} &= 6 \times 1 + \frac{10 - 6}{10} \times 6 \times 1 \\ &= 6 + 2.40 \\ &= 8.40 \end{aligned}$$

Advantages of the Rowan premium plan :

- i. It guarantees time wages.
- ii. Labour cost per unit is reduced because wage of the time saved are shared by the employer and the worker.
- iii. Fixed overhead cost per unit is reduced with increase in production.

Disadvantages of the Rowan premium plan :

- i. Under this system the workers do not get the full benefit of the time saved by them as they are paid bonus for a portion of the time saved.
- ii. The Rowan plan suffers from another drawback that two workers one very efficient and the other not so efficient may get the same bonus.

5.3.2 Comparison between the Halsey plan and the Rowan plan :

Both the plans are criticised by workers on the ground that they do not get the full benefit of time saved by them as they are paid bonus for a proportion of the time saved. The Rowan plan has another drawback that two workers, one very efficient and the other not so efficient, may get the same bonus.

A worker gets more premium under Rowan premium plan compare to Halsey premium plan when time saved is less than half of the standard time.

A worker gets more premium under Halsey premium plan compare to Rowan plan when time saved is more than half of the standard time. For instance the following problems depicts it.

Illustration

Standard time = 40 hours

Time taken = 16 hours

Rate per hour = Rs. 2.

Calculate wage under both Halsey and Rowan plans.

Solution :

According to Halsey plan the wage is -

Total earnings = $T \times R + 50\% \text{ of Time saved} \times \text{Rate per hour}$

$$\begin{aligned} &= 16 \times 2 + \frac{50}{100} \times 24 \times 2 \\ &= 32 + (12 \times 2) \\ &= 32 + 24 \\ &= 56 \end{aligned}$$

Wage under Halsey plan = Rs 56.

According to Rowan plan the wage is -

Total earnings = $T \times R + \frac{S - T}{S} \times T \times R$

$$\begin{aligned} &= 16 \times 2 + \frac{40 - 16}{40} \times 16 \times 2 \\ &= 32 + \frac{24}{40} \times 16 \times 2 \\ &= 32 + 19.2 \\ &= 51.2 \end{aligned}$$

Wage under Rowan plan = Rs. 51.2

In this Illustration time saved by worker is more than half of the standard time so worker gets more wage in Halsey plan compare to Rowan plan i.e

Wage under Halsey plan = Rs 56.

Wage under Rowan plan = Rs. 51.2

5.3.3 Differential piece rate plans :

Under differential piece rate plans workers are paid according to their merits because distinction is made between efficient and inefficient workers. An efficient worker can earn more wages because wages are linked to output. Following are the important differential piece rate plans.

A. **Taylor's Differential piece rate system** : This system was introduced by F.W. Taylor, the father of scientific management. This system penalise a slow worker by paying him a low piece rate for low production and reward an efficient worker by giving him a higher piece rate for a higher production. Taylor proceeded on the assumption that through time and motion study it is possible to fix a standard time for doing a particular task. To encourage the workers to complete the work within the standard time. According to him if a worker performs the work within or less than the standard time, he is paid a higher piece rate, and if he does not complete the work within the standard time, he is given a lower piece rate. Differential rates are usually as follows -

1. 80% of piece rate for below standard
2. 120% of piece rate for above standard.

Illustration :

Calculate the earnings of workers A and B under straight piece - rate system and Taylor's differential piece - rate system from the following particulars.

Normal rate per hour - Rs 18

Standard time per unit - 20 seconds

differentials to be applied :

80% of piece rate for below standard

120% of piece rate for above standard.

Worker A produces 1,300 units per day and

Worker B produces 1,500 units per day.

solution :

Standard production per 20 seconds = 1 unit

Standard production per 1 minute = $\frac{18.00}{180} = 3$ unit

Standard production per 1 hour = $3 \times 60 = 180$ unit

Standard production per day of 8 hours = $180 \times 8 = 1,440$ unit

$$\text{Low piece rate} = \frac{10 \text{ p} \times 80}{100} = 8 \text{ paisa}$$

$$\text{high piece rate} = \frac{10 \text{ p} \times 120}{100} = 12 \text{ paisa}$$

Earnings of Worker A :

$$1,300 \text{ units} \times 8 \text{ paisa} = \text{Rs } 104$$

$$\text{Earning of worker B} = 1500 \times 12 \text{ paisa} = \text{Rs } 180$$

Low piece rate has been applied in case of worker A because worker A's daily production of 1,300 units is less than the standard daily production of 1,440 units.

High piece rate has been applied to worker B because worker

B's daily productions of 1,500 units is more than the standard daily production of 1440units.

Advantages of Taylor's differential piece rate plan :

- i. An efficient worker can earn more wages.
- ii. Worker try to adopt better methods of production to increase their production.
- iii. Increased production will reduce fixed expenses.

Disadvantages of Taylor's differential piece rate plan :

- i. Workers have the fear of losing wages if they are not able to work due to some reason.
- ii. Workers may work at a very high speed for a few days earn good wages and then absent themselves for a few days, up setting the uniform flow of production.
- iii. Time is not guarented under this method.
- iv. Under this system if a worker just fails to complete the work within the standard time he earns much less wages than a worker who just completes the job within the standard time.

B. Merrick's Multiple piece Rate system : This method seeks to make an improvement in the Taylor's differential piece rate system. Under this method, three piece rates are applied for workers with different levels of performance.

Percentage of standard	Wage rate
Less than 83%	Normal Piece rate
83% to 100%	110% of normal piece rate
More than 100 %	120% of normal piece rate

This method is not as harsh as the Taylor's piece rate because penalty for slow workers is relatively lower.

Illustration :

The following particulars apply to a particular job :

Standard production per hour 6 units : Normal rate per hour Rs. 1.20

In an 8 hour day Mohan produces 32 units, Sohan produces 42 units, Lakhan produces 50 units.

Calculate the wages of the workers under merrick differential piece rate system

Solution :

Standard production per hour 6 units.

Normal rate per hour Rs. 1.20.

Piece rate = = 0.20

Merrick differential piece rates are

efficiency	Rate
upto 83%	Re 0.20
from 83% to 100%	110 % of Re 0.20 i.e 0.22
above 100 %	120% of Re 0.20 = Re 0.24

earnings of workers :

Mohan produces 32 units which means his efficiency is $\frac{32}{48} \times 100 = 67\%$ i.e below 83%.

Hence first rate will apply to him. His earnings will be $\frac{32}{48} \times 1.20 = 32 \times 0.20 = \text{Rs. } 6.40$.

Sohan produces 42 units, which means his efficiency is $\frac{42}{48} \times 100 = 87.5\%$

i.e. above 83% but below 100 % Hence second rate will apply to him.

His earnings will be = $42 \times 0.22 = \text{Rs } 9.24$.

Lakhan produces 50 units which means his efficiency is $\frac{50}{48} \times 100 = 104\%$

i.e above 100%. Hence third rate will apply to him.

His earnings will be = $50 \times 0.24 = \text{Rs. } 12.00$

5.3.4 Bonus plans of combination of Time and Piece Rates :

A. Gantt task Bonus plan :

This plan is based on careful time and motion study. A standard time is fixed for doing a particular task, worker's actual performance is compared with the standard time and his efficiency determined. If a worker takes more risk than the standard time to complete. The task he is given wages for the time taken by him and if a worker takes the standard time to perform the task he is given wages for the standard time and a bonus of 20% on the wages earned. If the worker completes the task in less than the standard time he is given wages for the standard time plus a bonus of 20% of the wages for the standard time.

Production	Wage Payment
production less than standard	Time rate
standard production	Time rate + 20 % Bonus
production more than standard	High piece rate.

Thus with every reduction in time the plan ensures progressive increase in total wages.

For this reason the plan is also known as ' Progressive rate ' system.

Illustration :

Form the following information of P,Q, R. workers calculate their wages under grantt task method.

Monthly standard production of each worker - 100 units

unit rate - 0.80 paisa

Actual production - P = 800 units

Q = 1000 units

R = 1200 units

Solution :

P wage :

Standar production per month = 1000 units

per unit = 0.80 paisa

P production = 800 units

$$\text{efficiency level} = \frac{800}{1000} \times 100 = 80\%$$

Since his efficiency is less than standard production, he gets guarantee wage i.e.

wage = standard units 0.80 = 800\

Q Wage :

Actual production = 1000 units

Standard production = 1000 units

Rate = 0.80

$$\text{efficiency level} = \frac{1000}{1000} \times 100 = 100 \%$$

Since his efficiency is 100% He gets 20% extra as bonus in addition to wage.

$$\text{Wage} = \text{units produced} \times \text{unit rate} \times \frac{120}{100}$$

$$= 1000 \times 0.80 \times \frac{120}{100} = 960$$

wage = Rs 960

R Wage :

Standard production = 1000 units

Actual production = 1200 units

Rate = 0.80 paisa

$$\text{efficiency level} = \frac{1200}{1000} \times 100 = 120 \%$$

Since his efficiency is more than 100% he gets 20% bonus along with piece wage.

$$\text{Wage} = \text{units produced} \times \text{unit rate} \times \frac{120}{100}$$

$$= 1200 \times 0.80 \times \frac{120}{100} = 1152$$

wage = Rs 1152

Advantages :

- i. It is simple to understand
- ii. It is acceptable by workers because it gives gurantee wage.
- iii. This system is advantageous to less efficient workers
- iv. Inefficient workers are motivated to become efficient and earn more wages by producing more.

Disadvantages :

- i. Distinction is made between efficient and inefficient workers
- ii. The quality of the output will suffer because workers will try to produce more to earn more wages.

B. **Emerson's efficiency bonus system** : Under this bonus scheme bonus is paid according to the efficiency of the worker.

Efficiency	Bonus
a. below 66 2/3 %	guaranteed time wage only
b. 66 2/3 % to 100 %	a bonus increasing from 0.01% to 20% above basic wage on 100 % efficiency.
c. over 100 %	a bonus of 20% above basic wage plus for each 1% increase in efficiency.

1%

Under this system less efficient workers get guaranteed time wage.

C. **Bedaux system** : Under this bonus scheme the wage is calculated as -

If 75 % bonus is paid to the workers the formula is

$$T \times R + 75 \% \left(\frac{P \times R}{60} \right)$$

P = Points saved

T = Time taken

R = Rate

If 100 % bonus is paid, the formula is $T \times R + 100 \% \left(\frac{P \times R}{60} \right)$

5.3.5 Group Bonus schemes :

Co partnership and profit sharing schemes :

These schemes are becoming very popular now - a - days. Under there schemes, worker get a share of the yearly profits of the company. This is done with a view of getting the cooperation of workers by giving then the feeling that they are to share the prosperity of the business. Workers can be given their share of profits in the form of cash or shares in the company :

Advantages

- i. Under these schemes workers get share in the profits
- ii. If the company pay share of profit in the form of shares, workers get participation in the company's management.
- iii. Workers get interest in the future of the business.

Disadvantages

- i. It is difficult to fix the percentage of profits to be given to workers. If the share is not given to the satisfaction of the workers, they may resort to strikes.
- ii. The share of profits is given to all workers, so no distinction is made between efficient and inefficient workers.

The payment of bonus Act 1965 has mad profit sharing compulsory in all industries and provides that to the eligible employees a minimum bonus of 8 1/3 % of gross annual earnings will have to be paid irrespective of profits made or losses incurred.

5.4 SOLVED PROBLEMS :

1. From the following information calculate wage of a worker under Halsey premium plan.

Time Rate per hour = Rs. 2.

Standard time = 40 hours

Time taken = 20 hours

Bonus = 50 % of time saved.

Solution :

$$\begin{aligned}
 \text{wage} &= T \times R + 50 \% (S - T) \times R \\
 &= 20 \times 2 + \frac{50}{100} (40 - 20) \times 2 \\
 &= 20 \times 2 + \frac{50}{100} \times 20 \times 2 \\
 &= 40 + 20 = \text{Rs } 60.
 \end{aligned}$$

2. In order to finish a task, standard time of 15 hours was determined by time and motion study. Ram took 16 hours to finish the job while Shyam took 12 hours. Time rate is Rs3. per hour. Calculate the earnings of the workers if 50 :50 Halsey premium plan is in operation.

Solution :

The Formula is

$$E = RT \times P (S - T) R$$

$$S = 15 \text{ hours}$$

Ram wage :

Ram could not finish his work within the standard time. So he will not be paid any bonus. His earnings will be :

$$= 16 \times 3 = \text{Rs } 48.$$

Shyam wage :

Shyam's earnings for 12 hours will be as follows :

$$E = 12 \times 3 + 50 \% (15 - 12) 3$$

$$= 36 + 4.50 = \text{Rs } 40.50$$

3. The following particulars apply to a job :

Standard time = 10 hours

Time rate = Rs. 2 per hour

Time taken = 8 hours

Calculate earnings under Rowan plans.

Solution :

Under Rowan system earnings will be calculated as follows -

$$E = T \times R + \frac{S - T}{S} \times T \times R$$

$$= 8 \times 2 + \frac{10 - 8}{10} \times 8 \times 2$$

$$= 16 + \frac{2 \times 8}{10} \times 2$$

$$= 16 + 3.20 = \text{Rs. } 19.20$$

4. From the following information calculate wage of a worker under Rowan plan.

Standard time = 32 hours

Actual time = 28 hours

Time saved = 4 hour

Solution :

$$\begin{aligned}
 \text{Wages} &= T \times R + \frac{S - T}{S} \times T \times R \\
 &= 28 \times 1 + \frac{4}{32} \times 28 \times 1 \\
 &= 28 + 3.50 \\
 &= 31.50
 \end{aligned}$$

Wage = Rs. 31.50

5. Calculate the earnings of a worker from the following information under :

- Time rate method
- Piece rate method
- Halsey plan
- Rowan plan

Standard time = 30 hours

Time taken = 20 hours

Hourly rate of wages is Re 1 per hour Plus a dearness allowance at 50 paise per hour worked.

Solution :

a. Earnings under time rate method -	Rs.
Wages for 20 hours (time taken) at Re 1 per hour	20
D. A for 20 hour at 50 paise per hour	<u>10</u>
Wage = Rs.	<u>30</u>
b. Earnings under piece rate method -	
Wages for 30 hours at Re 1 per hour	30
D. A for 20 hour at 50 paise per hour	<u>10</u>
Wage = Rs.	<u>40</u>

c. Earnings under Halsey plan

Rs

Wages for 20 hours at Re 1 per hour

20

Bonus for half of the time saved

$$\frac{S - T}{S} \times R = \frac{30 - 20}{2} \times 1 \quad 5$$

D. A at 50 paise for 20 hour

$$\text{Wage} = \text{Rs. } \frac{10}{35}$$

d. Earnings under Rowan plan

Rs

Wages for 20 hours at Re 1 per hour

20

$$\text{Bonus } \frac{S - T}{S} \times T \times R$$

$$\text{i.e. } \frac{30 - 20}{30} \times 20 \times 1 \quad 6.67$$

D. A at paise 50 paise per hour (20x 0.50)

10

$$\text{Wage} = \text{Rs. } \underline{36.67}$$

6. In an Assembly shop of a Motor car factory a workmen A, B, C and D work together as a team and are paid on group piece rate. They also work individually on daily rate jobs. In a 44 hour week the following hours have been spent by A, B, C, and D on group piece work. Viz, A - 40 hour, B-40hours, C - 30 hours and D - 20 hours. The balance of the time has been booked by each worker on day works jobs.

Their hourly rates are ;

A 0.50 paise

B 0.75 paise

C 1.00

D 1.00

The group piece rate is Re 1 per unit and the team has produced 150 units. Calculate the gross weekly earning of each workman taking into consideration that each individual is entitled to dearness allowance of Rs 20 per week.

Solution :

Group wages for 150 units at		Rs
Rs. 1 per unit		150
Less individual wages :	Rs	
Workman A - 40 hours x 0.50	20	
Workman B - 40 hours x 0.75	30	
Workman C- 30 hours x 1.00	30	
Workman D- 20 hours x 1.00	20	<u>100</u>
Group Bons		<u>50</u>

Group bonus is to be divided among workmen in proportion to their time wages i.e
20:30:30 :20

		Rs
Workman A 's share	$50 \times \frac{20}{100}$	10
Workman B's share	$50 \times \frac{30}{100}$	15
Workman C's share	$50 \times \frac{30}{100}$	15
Workman D's share	$50 \times \frac{20}{100}$	10

Statement of Gross weekly earnings

	Worker A	Worker B	Worker C	Worker D
Time wages on group work	20	30	30	20
Time wages on day work				
Jobs (balance of the time of the week of 44 hours	2 (4x50p)	3 (4x75p)	14 14x 1Re)	24 (24x1Re)
Share of bouns	10	15	15	10
Dearness allowonce	20	20	20	20
Gross	52	68	79	74

7. On the basis of the following information calculate the earnings of Ram and shyam under straight piece basis and Taylor's Differential piece rate system.

Standard production 8 units per hour

Normal time rate Re. 0.40 per hour

Differential to be applied

80% of piece rate for below standard

120% of piece rate for above standard.

In a 9 hour day

Ram produces 54 units

Shyam produces 75 units

Solution :**1. Straight piece Basis**

Earnings = No. of units x Rate per hour

Piece rate = $0.40 \div 8 = 5$ paise

Ram's earnings = 54×5 paise = 2.70

Shyam's earnings = $75 \times 0.05 = 3.75$

2. Tylor's piece rate basis

Standard production in a 9 hour day = $8 \times 9 = 72$ units

$$\text{Low piece rate} = 0.05 \times \frac{80}{100} = 4 \text{ paise}$$

$$\text{high piece rate} = 0.05 \times \frac{120}{100} = 6 \text{ paise}$$

$$\text{Ram's earnings} = 54 \times 4 \text{ paise} = 2.16$$

$$\text{Shyam's earnings} = 75 \times 6 \text{ paise} = 4.50$$

5.5 SELF ASSESSMENT QUESTIONS :

Five Marks Questions :

1. What is meant by an incentre plan ? What are its features.
2. Explain different methods of payment of incentives in brief.
3. Describe Halsey premium plan
4. What is a Rowan plan.
5. What are the merits and demerits of Taylor's differential piece rate system.
6. Explain co partnership and profit sharing schemes
7. From the following information calculate wages under Halsey plan and Rowan plan.

Standard time - 24 hours

Time taken - 20 hours

Rate per hour - Rs. 10

8. From the following information calculate a worker's earnings under the following scheme's

a. Piece rate

b. Halsey premium plan

c. Rowan premium plan

d. Taylor differential piece rate

Working hours in a week = 48

Wage rate per hour = Rs. 3.75

Time per piece = 20 minutes

Standard production per week = 120 pieces

Actual production per week = 150 pieces

Differential piece rates

1. Lower pieces rate 80%
2. Higher pieces rate 120%

Ans - a) Rs 225, b) Rs 183.75, c) Rs 187.20, d) Rs 270.

9. From the following information calculate wages of swetha, swathi, sruthi, Sravanthi under merrick differential piece rate system

Standard production - 12 units per hour

Rate per hour - 60 paise

working hour per week = 8

Actual production

swetha - 64

swathi - 96

sruthi - 84

Sravanthi - 100

Ans - Rs 3.20, 5.28, 6.00, 6.00

10. From the following information calculate wages of sita, geetha, neetha under merrick differential piece rate system

Piece rate per unit - Rs. 1.20

Standard production units per hour - 1 unit

working hours per week = 40 hours

Actual production

sita - 25 units

geetha - 40 units

neetha - 60 units

11. Calculate the earnings of a worker from the following information as under :

- a) Time Rate method
- b) Piece Rate method
- c) Halsey plan
- d) Rowan plan.

Information -

standard time 30 hours

time taken 20 hours

hourly rate of wage is Re 1 per hour plus a dearness allowance @ 50 paise per hour worked.

Ans - a) Rs 30, b) Rs 40 c) Rs 35, and d) Rs. 36.67

12. Calculate the earnings of workers A and B under straight piece rate system and Taylor's differential piece rate system from the following particulars

Normal rate per hour Rs. 2.40

Standard time per unit 30 seconds

Differentials to be applied -

80% of piece rate for below standard

120% of piece rate for above standard.

Worker A produces 800 units per day

Worker B produces 1000 units per day.

Ans - [A - Rs. 16 and Rs 12.80 ; B - Rs 20 and Rs 24]

5.6 BOOKS RECOMMENDED :

1. Cost & Management Accounting - S.P. Jain & K.L. Narang
2. Cost Accounting - P.K. Bar.
3. Practical costing - Khanna ; Pandey ; Ahuja.
4. Practical problems in Cost Accounting - S.P. Jain & K.L. Narang

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LESSON - 6**FINANCIAL STATEMENTS ANALYSIS**

16. Objective : After going through this lesson the student can know what is Financial Statement analysis? What are the tools that are available to the management to Analyse Financial Statements etc.

Structure :

- 6.1 Introduction.**
- 6.2 Definition of Financial Analysis.**
- 6.3 Types of Financial Analysis**
- 6.4 Procedure of Financial Statements Analysis**
- 6.5 Tools of Financial Analysis**
- 6.6 Comparative Statements**
 - 6.6.1 Comparative Balance Sheet**
 - 6.6.2 Comparative Income Statement**
- 6.7 Trend Analysis**
- 6.8 Common-size Statements**
 - 6.8.1 Common-size Balance Sheet.**
 - 6.8.2 Common-size Income Statements**
- 6.9 Limitations of Financial Analysis**
- 6.10 Summary**
- 6.11 Self Assessment Questions**
- 6.12 Exercises**
- 6.13 Reference Books.**

6.1. Introduction

Financial Statements are prepared primarily for decision making. But the information provided in the financial statements alone cannot help to draw meaningful conclusions. However, the information provided in the financial statements is of immense use in making decisions through analysis and interpretation of financial statements. Financial analysis is the process of identifying the financial strengths and weaknesses of the firm. There are various methods to analyse the financial statements, such as comparative statements, trend analysis, common size statements, schedule of changes in working capital, Funds Flow and Cash Flow analysis, cost – volume – profit analysis and ratio analysis.

6.2 Meaning and Concept of Financial Analysis:

The term ‘financial analysis, also known as analysis and interpretation of financial statements.

Metcalf and Titrad defines financial analysis as “analysing financial statements is a process of evaluating the relationship between component parts of a financial statement to obtain a better understanding of a firm’s position and performance”.

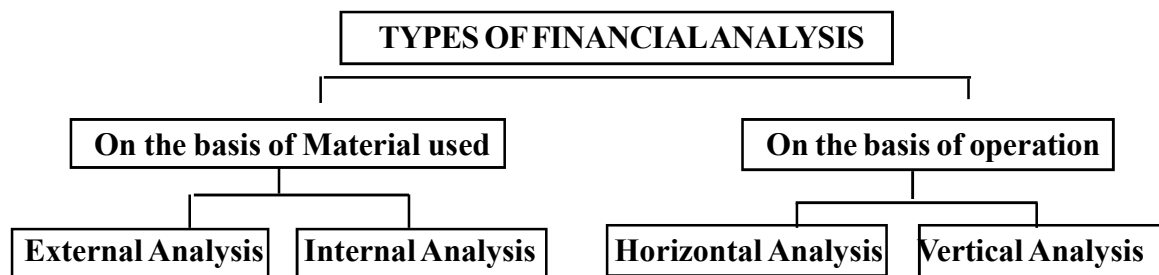
Myers define it as “Financial Statement Analysis is largely a study of relationship among the various financial factors in a business as disclosed by a single set of statements ,and a study of the trend of these factors as shown in a series of statements”.

After going through the above definitions we may conclude that the purpose of financial analysis is to diagnose the information contained in financial statements so as to judge the profitability and financial soundness of the firm. Financial statement analysis is an attempt to determine the significance and meaning of the financial statement data so that forecast may be made of the future earnings, ability to pay interest and profitability.

The term ‘financial statement analysis’ include both ‘analysis’, and ‘interpretation’. A distinction should, therefore, be made between the two terms. While the term ‘analysis’ is used to mean the simplification of financial data by methodical classification of the data given in the financial statements , ‘interpretation’ means, ‘explaining the meaning and significance of the data so simplified. Analysis and interpretation are interlinked and complimentary to each other. Analysis is useless without interpretation and interpretation without analysis is difficult or even impossible.

6.3 Types of Financial Analysis:

Financial Analysis can be classified on the basis of 1. Material used 2. On the basis of method of operation.



On the basis of material used financial analysis can be of two types i.e. 1) External analysis b) Internal analysis.

a) External Analysis:

This analysis is done by outsiders who do not have access to the detailed internal accounting records of the business firm. These outsiders include investors, potential investors, creditors, government agencies and the general public. For financial analysis, these parties depend on the published financial statements.

b) Internal Analysis:

The persons who have access to the internal accounting records conduct this internal analysis. These people are the executives and employees of the organisation as well as government agencies which have statutory powers vested in them.

2) On the basis of method of operation:

According to the method of operation followed in the analysis financial analysis can be of two types .a) horizontal analysis b) vertical analysis.

a) Horizontal Analysis:

Horizontal analysis refers to the comparison of financial data of a company for several years. The figures for this type of analysis are presented horizontally over a number of columns. The figures of the various years are compared with standard or base year. A base year is a year chosen as beginning point. The horizontal analysis makes it possible to focus attention on items that have changed significantly during the period under review. Comparison of an item over several periods with a base year may show a trend developing.

b) Vertical Analysis:

Vertical Analysis refers to the study of relationship of the various items in the financial statement of one accounting period. In this type of analysis the figures from financial statements of a year are compared with a base selected from the same year's statement. Common-size financial statements and financial ratios are the two tools employed in vertical analysis.

6.4 Procedure of Financial Statements Analysis:

In the analysis of financial statements three steps are involved.

They are 1) selection 2) classification and 3) interpretation.

In the first step the data or information which is relevant to analyse the financial statements is selected. In the second step this data is classified into groups and later in the third step conclusions are formed.

The following procedure is adopted for the analysis and interpretation of financial statements:

- 1) The analysis should be well versed with the concepts and principles of accounting. He should know the plans and policies of the management so that he may be able to find out whether these plans are properly executed or not.
- 2) He should know the object or aim of analysis to decide the sphere of work. If the aim is to find out the earning capacity of the enterprise then analysis of income statement will be undertaken. If financial position is to be studied then Balance Sheet analysis is required.
- 3) The data given in the financial statements should be re-organised and re-arranged into similar groups.
- 4) A relationship is established among financial statements with the help of tools and techniques of analysis such as ratios, trends, common size, Funds Flow etc.
- 5) The information is interpreted in a simple and understandable way.
- 6) The conclusion drawn from interpretation are presented to the management in the form of reports.

6.5 Methods of Financial Analysis:

The analysis and interpretation of financial statements is used to determine the financial position and results of operations as well. A number of methods are used to study the relationship between different statements. The following methods of analysis are generally used:

1. Comparative Statements ;
2. Trend Analysis;

3. Common-size Statements;
4. Funds Flow Analysis;
5. Cash Flow Analysis;
6. Ratio Analysis;
7. Cost Volume Profit Analysis.

The first three methods i.e., comparative statements, trend analysis and common -size statements are discussed in this lesson.

6.6 Comparative Statements:

The comparative financial statements are statements of the financial position at different periods of time. The elements of financial position are shown in a comparative form so as to give an idea of financial position at two or more periods. Any statement prepared in a comparative form will be covered in comparative statements. From practical point of view, generally, two financial statements i.e., balance sheet and income statement are prepared in comparative form for financial analysis purposes. Not only the comparison of the figures of two periods but also the relationship between balance sheet and income statement enables an in depth study of financial position and operative results. The two comparative statements are 1) Balance Sheet and 2) Income Statement.

6.6.1 Comparative Balance Sheet:

The comparative balance sheet analysis is the study of the trend of the same items, group of items and computed items in two or more balance sheets of the same business enterprise on different dates. The changes in periodic balance sheet items reflect the conduct of a business. The changes can be observed by comparison of the balance sheet at the beginning and at the end of a period and these changes can help in forming an opinion about the progress of an enterprise. The comparative balance sheet has four columns, the first two columns for the data of balance sheets. Third column is used to show increases in figures. The fourth column may be added for giving percentages of increases or decreases.

Guidelines for Interpretation of Comparative Balance Sheet:

While interpretation comparative Balance Sheet the interpreting is expected to study the following aspects:

- 1) Current financial position and liquidity position.
- 2) Long-term financial position.
- 3) Profitability of the concern.

For studying current financial position or short-term financial position of a concern, one should see the working capital in both the years. The excess of current assets over current liabilities will give the figures of working capital. The increase in working capital will mean improvement in the current financial

position of the business. An increase in current assets accompanied by the increase in current liabilities of the same amount will not show any improvement in the short-term financial position. A student should study the increase or decrease in current asset and current liabilities and this will enable him to analyse the current financial position. The second aspect which should be studied in current financial position is the liability position of the concern. If liquid assets like cash in hand, cash at bank, bills receivables, debtors etc; show an increase in the second year over the first year, this will improve the liquidity position of the concern. The increase in inventory can be on account of accumulation of stocks for want of customers, decrease in demand or inadequate sales promotion efforts. An increase in inventory may increase working capital of the business but it will not be good for the business.

The long-term financial position of the concern can be analysed by studying the changes in fixed assets, long-term liabilities and capital. The proper financial policy of concern will be to finance fixed assets by the issue of either long-term securities such as debentures, bonds, loans from financial institutions or issue of fresh share capital. An increase in fixed assets should be compared to the increase in long-term loans and capital. If the increase in fixed assets is more than the increase in long term securities then part of fixed assets has been financed from the working capital. On the other hand, if the increase in the long-term securities is more than the increase in fixed assets then fixed assets have not only been financed from long-term sources but part of working capital has also been financed from long-term sources. A wise policy will be to finance fixed assets by raising long-term funds.

The nature of assets which have increased or decreased should also be studied to form an opinion about the future production possibilities. The increase in plant and machinery will increase production capacity of the concern. On the liabilities side, the increase in loaned funds will mean an increase in interest liability whereas an increase in share capital will not increase any liability for paying interest. An opinion about the longterm financial position should be formed after taking into consideration the above mentioned aspects.

The study of increase or decrease in retained earnings, various resources and surpluses etc will enable the interpreter to see whether the profitability has improved or not. An increase in the balance of profit and loss account and other resources created from profits will mean an increase in profitability of the concern. The decrease in such accounts may mean issue of dividend, issue of bonus shares or deterioration in profitability of the concern.

After studying various assets and liabilities an opinion should be formed about the financial position of the concern. One cannot say if short-term financial position is good then long term financial position will also be good or vice – versa. A conclusion word about the overall financial position must be given at the end.

Illustration I:

The following are the Balance sheets of a concern for the year 2007 and 2008. Prepare a comparative Balance sheet and study the financial position of the concern.

BALANCE SHEET AS ON 31ST DECEMBER

	2007 Rs.	2008 Rs.		2007 Rs.	2008 Rs.
Equity			Land & Buildings	7,40,000	5,40,000
Share Capital	12,00,000	16,00,000	Plant & Machinery	8,00,000	12,00,000
Reserves &			Furniture &		
Surpluses	6,60,000	4,44,000	Fixtures	40,000	50,000
Debentures	4,00,000	6,00,000	Other Fixed Assets	50,000	60,000
Long -term			Cash in hand		
Loans on Mortgage	3,00,000	4,00,000	and at Bank	40,000	1,60,000
Bills payable	1,00,000	90,000	Bills Receivable	3,00,000	1,80,000
Sundry Creditors	2,00,000	2,40,000	Sundry Debtors	4,00,000	5,00,000
Other Current			Stock	5,00,000	7,00,000
Liabilities	10,000	20,000	Prepaid Expenses	-	4,000
	28,70,000	33,94,000		28,70,000	33,94,000

Solution :

Comparative Balance Sheet of a company for the year ending December 31, 2007 and 2008.

	Year ending 31 December		Increase/ Or Decrease Amount in Rs.	Increase Or Decrease (Percentage)
	2007 Rs.	2008 Rs.		
Assets :				
Current Assets :				
Cash in hand and at Bank	40,000	1,60,000	+ 1,20,000	+ 300
Bills Receivables	3,00,000	1,80,000	-1,20,000	-40
Sundry Debtors	4,00,000	5,00,000	+ 1,00,000	+ 25
Stock	5,00,000	7,00,000	+ 2,00,000	+ 40
Prepaid Expenses	—	4,000	+ 4,000	
Total Current Assets	12,40,000	15,44,000	+ 3,04,000	+ 24.52
Fixed Assets :				
Land & Buildings	7,40,000	5,40,000	-2,00,000	-27.03
Plant & Machinery	8,00,000	12,00,000	+ 4,00,000	+ 50.00
Furniture & Fixtures	40,000	50,000	+10,000	+25.00
Other fixed Assets	50,000	60,000	+10,000	+20.00
Total Fixed Assets	16,30,000	18,50,000	+2,20,000	+13.49
Total Assets	28,70,000	33,94,000	+5,24,000	+ 18.26

Liabilities & Capital :

Current liabilities :

Bills payable	1,00,000	90,000	-10,000	-10
Sundry Creditors	2,00,000	2,40,000	+ 40,000	+ 20
Other Current Liabilities	10,000	20,000	+10,000	+100
Total Current Liabilities	3,10,000	3,50,000	+40,000	+ 12.9
Debentures	4,00,000	6,00,000	+2,00,000	+50
Long-term loans on Mortgage	3,00,000	4,00,000	+1,00,000	+33
Total Liabilities	7,00,000	10,00,000	+3,40,000	+33.66
Equity share capital	12,00,000	16,00,000	+4,00,000	+ 33
Reserves & Surpluses	6,60,000	4,44,000	-2,16,000	-32.73
Total	28,70,000	33,94,000	+5,24,000	+18.26

Interpretation:

1. The comparative balance sheet of the company reveals that during 2008 there has been an increased in fixed assets of Rs. 2,20,000 i.e. 13.49% while long – term liabilities to outsiders have relatively increased by Rs. 3,00,000 and equity share capital has increased by Rs. 4 lakhs. This fact depicts that the policy of the company is to purchase fixed assets from the long – term sources of finance thereby not affecting working capital.
2. The current assets have increased by Rs. 3,04,000 i.e. 24.52% and cash has increased by Rs.1,20,000 on the other hand, there has been an increase in inventories amounting to Rs. 2 lakhs. The current liabilities have increased only by Rs. 40,000 i.e. 12.9%. This further confirms that the company has raised long – term finances even for the current assets resulting into an improvement in the liquidity position of the company.
3. Reserves and surpluses have decreased from Rs. 6,60,000 to Rs. 4,44,000 i.e. 32.73% which shows that the company has utilised reserves and surpluses for the payment of dividend to shareholders either in cash or by the issue of bonus shares.
4. The overall financial position of the company is satisfactory.

6.6.2. Comparative Income Statement:

The income statement gives the results of the operation of a business. The comparative income statement gives an idea of the progress of a business over a period of time. The changes in absolute data in money values and percentages can be determined to analyse the profitability of the business. Like comparative balance sheet, income statement also has four columns. First two columns give figures of various items for two years. Third and fourth columns are used to show increase or decrease in figures in absolute amounts and percentages respectively.

Guidelines for Interpretation of Income statements:

The analysis and interpretation of Income statement will involve the following steps:

1. The increase or decrease in sales should be compared with the increase or decrease in cost of goods sold. An increase in sales will not always mean an increase in profit. The profitability will improve if increase in sales is more than the increase in cost of goods sold. The amount of gross profit should be studied in the first step.
2. The second step of analysis should be the study of operational profits. The operating expenses such as office and administrative expenses, selling and distribution expenses should be deducted from gross profit to find out operating profits. An increase in operating profit will result from the increase in sale position and control of operating expenses. A decrease in operating profit may be due to an increase in operating expenses or decrease in sales. The change in individual expenses should also be studied. Some expenses may increase due to expansion of business activities while others may go up due to managerial inefficiency.
3. The increase or decrease in net profit will give an idea about the overall profitability of the concern. Non-operating expenses such as interest paid, losses from sale of assets, writing off of deferred expenses, payment of tax etc; decrease the figure of operating profit. When all non-operating expenses are deducted from operational profit, we get a figure of net profit. Some non-operating incomes may also be there which will increase net profit. An increase in net profit will give us an idea about the progress of the concern.
4. An opinion should be formed about profitability of the concern and it should be given at the end. It should be mentioned whether the overall profitability is good or not.

We will examine these things with the following illustrations.

Illustration 2:

The income statements of a concern are given for the year ending on 31st Dec 2007 and 2008. Re-arrange the figures in a comparative form and study the profitability position of the concern.

	2007	2008
	Rs.(000)	Rs.(000)
Net Sales	3140	3600
Cost of goods sold	1800	2000
Operating Expenses :		
General and administrative expenses	280	288
Selling expenses	320	360
Non-operating Expenses :		
Interest paid	100	120
Income - tax	280	320

Solution :

Comparative Income Statement for the year ended December 31, 2007 and 2008.

	Year ending 31 December		Increase/(+) Or Decrease(-) Amount in Rs. (,000)	Increase(+) Or Decrease(-) (Percentage)
	2007 Rs. (,000)	2008 Rs. (,000)		
Net Sales	3140	3600	+ 460	+ 14.6
<u>Less : Cost of goods sold</u>	1800	2000	+ 200	+ 11.0
Gross Profit	1840	1600	+ 260	+ 19.40
Operating Expenses :				
General & Administrative Expenses	280	288	+ 8	+ 28
Selling Expenses	320	360	+ 40	+ 12.5
Total Operating Expenses	600	648	+ 48	+ 8.0
Operating Profit	740	952	+ 212	+ 28.65
<u>Less : Other deductions interest paid</u>	100	120	+ 20	+ 20.00
Net Profit before tax	640	832	+ 192	+ 30.00
<u>Less : Income Tax</u>	280	320	+ 40	+ 14.3
Net Profit After tax	360	512	+ 152	+ 42.22

Interpretation:

The comparative income statement given above reveals that there has been an increase in net sales of 14.65% while the cost of goods sold has increased nearly by 11% there by resulting in an increase in the gross profit of 19.4%. Although the operating expenses have increased by 8% the increase in gross profit is sufficient to compensate for the increase in operating expenses and hence there has been an overall increase in operational profits amounting to Rs.2,12,000 i.e.28.65% in spite of an increase in financial expenses of Rs.20,000 for interest and Rs.40,000 for Income tax. There is an increase in net profits after tax amounting to Rs1,52,000 i.e.42.22%. It may be concluded that there is a sufficient progress in the company and the overall profitability of the company is good.

Illustration 3:

Prepare comparative statements from the following data:

	2007	2008
	(Rs. In lakhs)	
Net Sales	1200	1500
Cost of goods sold	800	1200
Admn. Expenses	40	40

Selling Expenses	20	20
Net Profit	340	240
	2007	2008
Balance Sheets	(Rs. In lakhs)	
Equity capital	800	800
6% preference share capital	600	600
Reserves	400	490
6% Debentures	200	300
Bill payable	100	150
Creditors	300	400
Tax Payable	200	300
	2600	3040
Land	200	200
Buildings	600	540
Plant	600	540
Furniture	200	280
Stock	400	600
Cash	?	?
	2600	3040

Solution :

Comparative Income Statement for the year ended 2007 and 2008.

	Year ending 31 December		Increase (+) Decrease (-) Rs.Lakhs	Increase Decrease (-) (Percentage)
	2007 Rs. (in lakhs)	2008 Rs. (in lakhs)		
Net Sales	1200	1500	+ 300	+ 25
<u>Less</u> : Cost of goods sold	800	1200	+ 400	+ 50
a/. Gross Profit	400	300	- 100	- 25
Operating Expenses :				
Administrative Expenses	40	40	—	—
Selling Expenses	20	20	—	—
Total Operating Expenses	60	60	—	—
Operating Profit (a – b)	340	240	- 100	- 29.41

Less : Other Expenses	—	—	—	—
Net Profit	340	240	– 100	– 29.41

Comparative Balance Sheet for the year ended December 31, 2007 and 2008.

	Year ending 31 December		Increase/ Or Decrease Amount in Rs. (in lakhs)	Increase Or Decrease (Percentage) Assets :
	2007 Rs. (in lakhs)	2008 Rs. (in lakhs)		
Current Assets :				
Cash	600	880	+ 280	+ 46.67
Stock	400	600	+ 200	+ 50.00
Total Current Assets	1,000	1,480	+ 480	+ 48.00
Fixed Assets :				
Land	200	200	—	—
Buildings	600	540	– 60	– 10
Plant	600	540	– 60	– 10
Furniture	200	280	+ 80	+ 40
Total Fixed Assets	2600	3040	+ 440	+ 16.92
Liabilities and Capital				
Current Liabilities :				
Bills Payable	100	150	+ 50	+ 50.0
Creditors	300	400	+ 100	+ 33.3
Tax Payable	200	300	+ 100	+ 50.0
Total Current liabilities	600	850	+ 250	+ 41.67
Debentures	200	300	+ 100	+ 50.0
Total Liabilities	800	1150	+ 350	+ 43.75
Equity share capital	800	800	—	—
6% pref. Share capital	600	600	—	—
Reserve	400	490	+ 90	+ 22.5
Total	2600	3040	+ 440	+ 16.92

Interpretation:

a) The comparative income statement reveals that there has been increase in net sales of 25% while the cost of goods sold has increased disproportionately by 50% thereby resulting in a decrease of gross profit of 25%. Although the operating expenses have remained constant, there has been decrease in net profit of 29.41%. The company needs to take into the causes of increase in cost of goods sold and control the same.

b) The comparative balance sheet of the company reveals that during 2008 there has been decrease in fixed assets of Rs.40 lakhs, i.e. 2.5% while long-term liabilities to outsiders have increased by Rs.100 lakhs, i.e. 50%. There has also been increase of Rs.90 lakhs, i.e. 22.5% in reserves of the company. Thus, the company has used long-term resources to finance additional working capital.

The current assets have increased by Rs.480 lakhs in 2008 i.e. 48%. There has been sufficient increase in balance of cash as well as stock. On the other hand current liabilities have increased by only Rs.250 lakhs i.e. 41.67%. This further confirms that the company has raised long-term finances even for the current assets resulting into an improvement in the liquidity position of the company.

6.7 Trend Analysis:

The financial statements may be analysed by computing trends of series of information. This method determines the direction upwards or downwards and involves the computation of the percentage relationship that each statement item bears to same item in base year. The figures of the base year are taken as 100 and trend ratios for other years are calculated on the basis of base year.

Procedure for calculating Trends:

1. One year is taken as a base year, generally, the first year is taken as base year.
2. The figures of base year are taken as 100.
3. Trend percentages are calculated in relation to base year.

The interpretation of trend analysis involves a cautious study. The mere increase or decrease in trend percentage may give misleading results if studied in isolation. An increase of 10% in current assets may be treated favourable. If this increase in current assets is accompanied by an equivalent increase in current liabilities, then this increase will be unsatisfactory. The increase in sales may not increase profits if the cost of production has also gone up.

The base period should be carefully selected, it should always be a normal period. The accounting procedures and conventions used for collecting data and preparation of financial statements should be similar, otherwise the figures will not be comparable.

Illustration 4:

Calculate the trend percentages from the following figures of X Ltd. taking 2004 as the base and interpret them:

Year	Sales	Stock	Rs. in Lakhs Profit before tax
2004	5,643	2,127	963
2005	7,020	2,343	1,305
2006	7,965	2,448	1,374
2007	9,063	2,832	1,581
2008	11,304	3,462	2,016

Solution :

Trend percentages. (Base year 2004 = 100)

Year	Sales		Stock		Profit Before tax		
	(Amount Rs.Lakhs)	Trend Percentage	Amount Rs.Lakhs	Trend Percentage	Amount Rs.Lakhs	Trend Percentage	
2004	5,643	100	2,127	100	963	100	
2005	7,020	124	2,343	110	1,305	136	
2006	7,965	141	2,448	115	1,374	143	
2007	9,063	161	2,832	133	1,581	164	
2008	11,304	200	3,462	162	2,016	209	

Interpretation:

1. The sales have continuously increased in all the years up to 2008. The percentage in 2008 is 200 as compared to 100 in 2004. The increase in sales is quite satisfactory.
2. The figures of stock have also increased from 2004 to 2008. The increase in stocks is more in 2007 and 2008 as compared to earlier years.
3. Profit before tax has substantially increased. In five years period it has more than doubled. The comparative increase in profits is much higher in 2007 and 2008, as compared to 2006.

The expansion of the firm is good and it has doubled its sales and profits in just five years time. The profits have increased more than sales which shows that there is a proper control over cost of goods sold, the overall performance of the concern is good.

6.8 COMMON SIZE STATEMENT:

The common-size statements, balance sheet and income statement, are shown in analytical percentages. The figures are shown as percentages of total assets, total liabilities and total sales. The total assets are taken as 100 and different assets are expressed as a percentage of the total. Similarly, various liabilities are taken as a part of total liabilities. The short – comings in comparative statements and trend percentages where changes in items could not be compared with the totals have been covered up. The analyst is able to assess the figures in relation to total values. The common – size statements may be prepared in the following ways.

1. The totals of assets or liabilities are taken as 100.
2. The individual assets are expressed as a percentage of total assets, i.e., 100 and different liabilities are calculated in relation to total liabilities. For example, if total assets are Rs. 10 lakhs and venture value is Rs. 1 lakh, then it will be 10% of total assets.

$$\frac{1,00,000}{10,00,000} \times 100$$

6.8.1. COMMON SIZE-BALANCE SHEET

A statement in which balance sheet items are expressed as the ratio of each asset to total assets and the ratio of each liability is expressed as a ratio of total liabilities is called common-size balance sheet.

The common-size balance sheet can be used to compare companies of differing size. The comparison of figures in different periods is not useful because total figures may be affected by a number of factors.

Illustration 5:

The Balance Sheet of C & Co. and V & Co. or givan has follows.

Balance Sheet as on Dec 31, 2008

	C & Co Rs. ,000	V & Co Rs. ,000
Liabilities :		
Preference share capital	960	1280
Equity share capital	1200	3200
Reserves & surpluses	112	144
Long - term loans	920	1040
Bills payable	16	-
Sundry Creditors	96	32
Outstanding Expenses	120	48
Proposed dividend.	80	720
	3,504	6,464
Land and Buildings	640	984
Plant and Machinery	2,672	4,800
Temporary Investments	8	320
Inventories	80	200
Book- Debts	32	64
Prepaid expenses	8	16
Cash and Bank Balances	64	80
	3,504	6,464

Solution :

COMMON SIZE BALANCE SHEETS

	C.CO Amount (Rs.000)	%	V & Co. Amount (Rs.000)	%
Assets :				
Fixed Assets :				
Land, Buildings	640	18.26	984	15.22
Plants & Machinery	2,672	76.24	4,800	74.62
Total Fixed Assets	3,312	94.52	5,784	89.48
Current Assets :				
Temporary Investments	8	0.23	320	4.95
Inventories	80	2.28	200	3.08
Debtors	32	0.91	64	0.99
Prepaid expenses	8	0.23	16	0.25
Cash, Bank Balances	64	1.83	80	1.25
Total Assets	3,504	100.00	6,464	100.00
Capital - Reserves :				
Preference capital	960	27.39	1,280	19.80
Equity share capital	1,200	34.25	3,200	49.50
Reserves, surpluses	112	3.19	144	2.23
Total Capital & Reserves	2,272	64.83	4,624	71.53
Long-term loans	920	26.25	1,040	16.09
Current liabilities :				
Bill payable	16	0.46	—	—
Creditors	96	2.74	32	0.49
Expenses Payable	120	3.44	48	0.74
Proposed Dividend	80	2.28	720	11.15
Total Current liabilities	312	8.92	800	12.38
Total liabilities	3,504	100.00	6,464	100.00

Comments:-

1. an Analysis of pattern of financing of both the companies shows that V & Co. is more traditionally financed as compared to C & Co. The former company has depended more on its own funds

as it shown by balance sheet. Out of total investments, 71.53% of the funds are proprietor's funds and outsider's funds account only for 28.47%. In C & Co., proprietor's funds are 64.83% while outsider's share is 35.17% which shows that this company has depended more upon outsiders funds. In the present day economic world, generally, companies depend more on outsiders funds.

2. Both the companies are suffering from in adequacy of working capital. The percentage of current liabilities is more than the percentage of current assets in both the companies.

3. A close look at the balance sheets shows that investments in fixed assets have been financed from working capital in both the companies.

In C & Co., fixed assets accounts for 94.52% of total assets while long – term funds account for 91.08% of total funds. In V & Co. fixed assets account for 94.52% of total funds. In V & Co., fixed assets account for 89.48% whereas long term funds account for 87.62% of total funds instead of using long term funds for working capital purposes the companies have used working capital for purchasing fixed assets.

4. Both the companies face working capital problem and immediate steps should be taken to issue more capital or raise long-term loans to raise working capital position.

6.8.2. COMMON SIZE INCOME STATEMENT:-

The items in income statement can be shown as percentages of sales to show the relation of each item to sales. A significant relationship can be established between items of income statement and volume of sales. The increase in sales will certainly increase selling expenses and not administrative or financial expenses. In case the volume of sales increases to a considerable extent, administrative and financial expenses may go up. In case the sales are declining, the selling expenses should be reduced at once. So, a relationship is established between sales and other items in income statement and this relationship is helpful in evaluating operational activities of the enterprise.

Illustration 6:

Following are the Income statements of a company for the year ending

Dec.31-2007, and 2008.

	2007	2008
	(Rs.000)	(Rs.000)
Sales	3,000	4,200
Other Incomes	120	90
	<u>3,120</u>	<u>4,290</u>
Expenses		
Cost of goods sold	1950	3060
Office expenses	120	150
Selling expenses	180	270
Interest	150	180
Net Profit	<u>2,400</u>	<u>3,660</u>
	<u>720</u>	<u>630</u>

Solution :

**Common size Income Statement
for the year ending Dec.2007 and 2008.**

	2007		2008	
	Rs.000	%	Rs.100	%
Net Sales	3,000	100.00	4,200	100.00
<u>Less :</u> Cost of goods sold	1,950	65.00	3,060	72.86
Gross Profit	2,050	35.00	1,140	27.14
<u>Less :</u> Operating expenses				
Office expenses	120	4.00	150	3.58
Selling expenses	180	6.00	270	6.42
Total operating expenses	300	10.00	420	10.00
Operating profit	1,750	25.00	720	17.14
<u>Add :</u> Other Incomes	120	4.00	90	2.14
Total Income	1,870	29.00	810	19.28
<u>Less :</u> Non operating expenses				
Interest	150	5.00	180	4.28
Net profit	720	24.00	630	15.00

Interpretation:

1. In 2008, sales and gross profit has increased in absolute figures when compared to 2007 but the percentage of gross profit to sales has gone down in 2008.
2. The increase in cost of sales as a percentage of sales has brought the profitability from 35 to 27.14%.
3. Operating expenses have remained the same in both the years but non-operating expenses have decreased as a percentage in 2008. A slight decrease in non-operating expenses in the latter year could not help to improve profits.
4. Net profits have decreased both in absolute figures and as a percentage in 2008 as compared to 2007.
5. The overall profitability has decreased in 2008 and the reason is a rise in cost of sales. The company should take immediate steps to control its cost of sales, otherwise the company will be in trouble.

6.9. Limitations of Financial Analysis:-

Financial analysis is a powerful mechanism of determining financial strengths and weaknesses of a

firm. The financial analyst has also to be careful about the impact of price level changes, window – dressing of financial statements, changes in accounting policies of a firm, accounting concepts and conventions and personal judgement etc. some of the important limitations of financial analysis are:

1. It is only a study of interim reports.
2. Financial analysis is based upon only monetary information and non-monetary factors are ignored.
3. It does not consider changes in price levels.
4. As the financial statements are prepared on the basis of a going concern, it does not give exact position. Thus this has become as serious limitation to financial analysis.
5. Changes in accounting procedure by a firm may often make financial analysis misleading.
6. Analysis is only a means and not an end in itself. The analyst has to make interpretation and draw his own conclusions. Different people may interpret the same analysis in different ways.

6.10. Summary:

Financial statements are prepared primarily for decision-making. By analysing these financial statements one can know the financial strengths and weaknesses of the firm. It is the interpretation of financial statements. On the basis of material used it may be an external and internal. On the basis of operation it may be horizontal and vertical. A number of methods are used to study financial statements. The general methods are

1. Comparative statements
2. Trend Analysis
3. Common-size statements.

6.11. Self Assessment Questions:

1. What is financial analysis ?
2. What are the types of financial analysis?
3. What is the procedure of analysis and interpretation of financial statements ?
4. Write a brief note on comparative statements.
5. What is trend analysis?
6. Explain common-size statements.
7. What are the limitations of financial statement analysis?
8. What do you understand by the analysis and interpretation of financial statements ? Discuss their utility and significance to the management ?
9. What are the different methods used for the analysis and interpretation of financial statements ?
10. What is common-size balance sheet and income statement ? Explain the technique of preparing the common-size balance sheet ?
11. Explain the usefulness of trend percentages in interpretation of financial performance of a company.

6.12. Exercises :

1. The following are the Income statements of Achut Ltd for the years 2007 and 2008. Prepare a comparative income statement and interpret it.

	2007 (Rs. 000)	2008 (Rs.000)		2007	2008 (Rs. 000)
(Rs.000)					
To Opening Stock	170	400	By Sales	2,000	2,400
To Purchases	1,000	1,100	By Closing Stock	400	450
To Wages	120	160	By Income		
To Salaries	84	128	from Investments	24	30
To Rent, Rates & Insurance	70	80	By Dividend	10	15
To Depreciation	80	120			
To Selling expenses	24	24			
To Discount	10	14			
To Profit on sale of plant	—	16			
To Interest paid	24	48			
To Net Profit	852	825			
	<u>2,434</u>	<u>2,894</u>		<u>2,434</u>	<u>2,894</u>

2. In the basis of the balance sheets of a company, prepare a comparative Balance sheet and analyse the changes in Assets and liabilities.

	Mar.31, 2007 (Rs.000)	Mar 31, 2008 (Rs.000)
Equity share capital	1,500	3,000
Preference share capital	300	600
General Reserve	300	750
Expenses Payable	150	150
Bills Payable	300	600
Profit & Loss Account	600	900
	<u>3,150</u>	<u>6,000</u>
Fixed Assets	1,200	3,000
Investments	900	300
Receivables	600	1,200

Stock	300	1,200
Cash	150	300
	3,150	6,000

3. From the following income statements for the years, march 31, 2007 and 2008. Prepare a comparative Income Statement and write your interpretation.

Income Statements

Liabilities	2007 (Rs.)	2008 (Rs.)	Assets	2007 (Rs.)	2008 (Rs.)
To Cost of goods sold	18,00,000	19,00,000	By Sales	30,50,000	34,00,000
To Administrative Expenses	1,86,500	1,91,980	By Interest & Dividend	15,000	12,400
To Selling expenses	3,80,000	4,18,000	By Profit on sale of		
To Interest paid	16,000	14,000	fixed Assets	12,000	16,000
To Loss on sale of machinery	5,000	1,600			
To Income tax	1,70,000	3,36,000			
To Net Profit	5,19,500	5,66,840			
	30,77,000	34,28,400		30,77,000	34,28,400

4. From the Balance sheets of the company for the years 2007 and 2008. Prepare a comparative balance sheet and make a comment.

Balance Sheet

	Mar.31, 2007 (Rs.000)	Mar 31, 2008 (Rs.000)
Liabilities :		
Preference share capital	1,500	2,700
Equity share capital	1,800	3,600
General Reserves	1,200	1,500
Profit & Loss Account	600	675
Long - term loans	600	3,000
Bills Payable	240	300
Creditors	60	75
	6,000	11,850
Assets :		
Fixed Assets	3,000	7,500
Investments	900	600

Current Assets :

Bills Receivables	600	1,050
Stock	1,200	1,800
Cash	300	900
	<u>6,000</u>	<u>11,850</u>

5. Convert the following Balance Sheets into common size Balance Sheet and comment for the years 2007 and 2008.

Balance Sheet

	2007	2008		2007	2008
Liabilities	(Rs. 000)	(Rs.000)	Assets	(Rs. 000)	(Rs.000)
Equity Share capital	10,000	12,000	Fixed Assets :		
Capital Reserve	900	1,850	Buildings	8,000	14,000
General Reserve	5,000	4,500	Land	1,980	3,450
Sinking Fund	900	1,000	Furniture	770	1050
Debentures	4,500	6,500	Current Assets :		
Creditors	2,000	1,500	Debtors	4,500	3,900
Expenses Payable	150	200	Cash	2,000	150
			Stock	3,200	2,500
			Investments	3,000	2,500
	<u>23,450</u>	<u>27,550</u>		<u>23,450</u>	<u>27,550</u>

6. The Balance Sheets of a company for the years 2007 and 2008 were as follows. Prepare a common size Balance Sheet and make your comments.

Balance Sheet

	2007	2008		2007	2008
Liabilities	(Rs. 000)	(Rs.000)	Assets	(Rs. 000)	(Rs.000)
Share Capital	21,00,000	23,00,000	Goodwill	3,40,000	20,000
Reserves	10,08,000	10,08,000	Plant	17,04,000	16,52,000
Surplus	7,02,140	2,32,280	Patents	1,20,000	96,000
9% Debentures	5,00,000	4,00,000	Investments	4,20,000	1,00,000
Interest Payable	15,000	12,000	Cash	6,82,600	11,51,200
Creditors	4,48,000	5,72,000	Debtors	5,55,040	6,12,000
Dividends			Stock	9,43,200	11,50,680
Payable	—	1,00,000	Prepaid expenses	12,800	18,400
Provision for tax	32,000	1,92,000	Discount on Debentures	27,500	20,000
	<u>48,05,140</u>	<u>48,20,280</u>		<u>48,05,140</u>	<u>48,20,280</u>

6.13. Reference Books :

- | | | |
|---------------------|---|--|
| 1. Sharma, Gupta | – | Management Accounting. |
| 2. I.M. Pande | - | Management Accounting |
| 3. Manmohan & Goyal | – | Principles of Management Accounting. |
| 4. Hom Green | - | Introduction to Management Accounting. |

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LESSON - 7

CALCULATION OF RATIOS - ANALYSIS

Objective: After going through this lesson the student can know what are the different Ratios calculated? How these ratios help different people ? and How to analyse them.

Structure :

- 7.1 Introduction**
- 7.2 Classification of Ratios.**
- 7.3 Calculation of Ratios.**
- 7.4 Liquidity Ratios**
- 7.5 Long-term solvently and leverage ratios**
- 7.6 Profitability ratios**
- 7.7 Leverage Ratios**
- 7.8 Summary**
- 7.9 Self Assessment Questions**
- 7.10 Exercises**
- 7.11 Reference books**

7.1 Introduction :

Different people analyse Ratios for different purposes. For example : The supplier of the concern interested in liquidity of the concern, Longterm creditors are interested in solvency Ratios, share holders are interested in the profitability of the concern etc.,

7.2 Classification of Ratios.

Various accounting ratios can be classified on the basis of the following :

I. Traditional classification or statement Ratios.

- a) Balance sheet Ratios.
- b) Profit and loss Account Ratios.
- c) Mixed Ratios.

II. Functional classification or classification According to tests :

- a) Liquidity Ratios
- b) Leverage Ratios
- c) Activity Ratios
- d) Profitability Ratios.

III. Ratios according to importance

- a) Primary Ratios
- b) Secondary Ratios

Now we will list out all the ratios in detail on different basis.

1) Traditional Classification :

Traditional classification or classification according to the statement, from which these ratios are calculated, is as follows:

i) Balance sheet Ratios

1. Current Ratio
2. Liquid Ratio
3. Absolute liquidity Ratio
4. Debt Equity Ratio
5. Proprietary Ratio
6. Capital Gearing Ratio
7. Assets - Proprietorship Ratio
8. Capital Inventory to working capital Ratio
9. Ratio of current Assets to Fixed Assets

ii) Profit and Loss Account Ratios.

1. Gross Profit Ratio
2. Operating Ratio
3. Operating Profit Ratio
4. Net Profit Ratio
5. Expense Ratio
6. Interest Coverage Ratio

3. Mixed Ratios :

1. Stock Turnover Ratio
2. Debtors Turnover
3. Payable Turnover Ratio
4. Fixed Assets Turnover Ratio
5. Return on Equity
6. Return on shareholder's Funds
7. Return on capital Employed
8. Capital Turnover Ratio
9. Working capital Turnover Ratio
10. Return on Total Resources
11. Total Assets Turnover

II. Functional classification :

1. Liquidity Ratios
2. Long-term solvency and leverage Ratios
3. Activity Ratios
4. Profitability Ratios.

1. Liquidity Ratio can be sub-classified as follows.

- A.
 1. Current Ratio
 2. Liquid Ratio/Acid Test
 3. Absolute Liquid Ratio
 4. Internal Measure.
- B.
 1. Debtors Turnover Ratio
 2. Creditors Turnover Ratio
 3. Inventory Turnover Ratio

2. Long-term solvency and leverage Ratios :

1. Debt Equity Ratio
2. Debt to total capital Ratio
3. Interest coverage
4. Cash Flow
5. Capital gearing

3. Activity Ratios :

1. Inventory Turnover Ratio
2. Debtors Turnover
3. Fixed Assets Turnover Ratio
4. Total Asset Turnover Ratio
5. Working capital Turnover Ratio
6. Payables Turnover Ratio
7. Capital Employed Turnover.

4. Profitability Ratios :**A. In relation to sales**

1. Gross profit Ratio
2. Operating Ratio
3. Operating Profit Ratio
4. Net Profit Ratio
5. Expense Ratio

B. In relation to investments

1. Return on Investments
2. Return on Capital

3. Return on Equity Capital
4. Return on Total Resources
5. Earnings per share
6. Price – Earning Ratio

7.3 Calculation of Ratios :

Now we will discuss the method of calculation, their interpretation, advantages, and limitation of various ratios which have been classified into different groups in detail.

7.4 Liquidity Ratios :

The short-term creditors of a company like suppliers of goods on credit and commercial banks providing short-term loans are primarily interested in knowing the company's ability to meet its current or short-term obligations as and when these become due. The short-term obligations of a firm can be met only when there are sufficient liquid assets. Therefore a firm must ensure that it does not suffer from lack of liquidity or the capacity to pay its current obligations. It is very important to have a proper balance in regard to the liquidity of a firm, the following ratios can be calculated.

1. Current Ratio
2. Quick or Acid Test or Liquid Ratio
3. Absolute Liquid Ratio or cash position Ratio.

1. Current Ratio :

Current ratio may be defined as the relationship between current assets and current liabilities. This ratio, also known as working capital ratio. It is used to make the analysis of a short-term financial position or liquidity of a firm. It is calculated by dividing the total of current assets by total of the current liabilities.

Current Ratio = Current Assets / Current Liabilities

The following are the components of current assets and current liabilities :

Current Assets

1. Cash in hand
2. Cash at bank
3. Short-term Securities
4. Short-term Investments
5. Bills Receivable
6. Sundry Debtors
7. Stock
8. Work-in-Progress
9. Prepaid Expenses.

Current Liabilities

1. Outstanding Expenses
2. Bills payable
3. Sundry Creditors
4. Short-term Advances
5. Income Tax Payable
6. Dividends Payable
7. Bank over draft.

Interpretation of Current Ratio :

A relatively high current ratio is an indication that the firm has the ability to pay its current obligations in time as and when they become due. On the other hand, a relatively low current ratio represents that the liquidity position of the firm is not good and the firm shall not be able to pay its current liabilities in time. An increase in the current ratio represents improvement in the liquidity position of a firm while a decrease in the current ratio indicates that there has been a deterioration in the liquidity position of a firm. A ratio equal to the rule of thumb of 2 : 1 i.e., current assets double the current liabilities is considered to be satisfactory.

Points to be noted for interpretation :

A number of factors should be taken into consideration before reaching a conclusion about short-term financial position. Some of these factors are as such:

a) Type of Business :

Current ratio is influenced by the type of business. A business with heavy investments in fixed assets may be successful even if the ratio is low. On the other hand, a trading concern will require a high current ratio because it has to pay its suppliers quickly.

b) Types of products :

The type of products in which a business deals also influences current ratio. A business dealing in goods whose demand changes fast will require a higher current ratio.

c) Reputation of the concern :

A business unit with better goodwill and reputation may afford a small current ratio because the turnover is more and creditors also allow credit for longer periods.

d) Seasonal Influence :

Current assets and current liabilities change with the seasons. In a peak season, current assets will be more and current ratio will be high. On the other hand this ratio will go down when the season is off.

e) Type of Assets Available :

The type of current assets in the business also influence interpretation of current Ratio. If the current assets include large amounts of slow moving stocks then even a high ratio may not be satisfactory.

Importance of Current Ratio :

Current Ratio is a general and quick measure of liquidity of a firm. It represents the 'margin of safety'. It is most widely used for making short-term analysis of the financial position or short-term solvency of a firm.

Limitations of Current Ratio :

One has to be careful while using current ratio as a measure of liquidity because it suffers from the following limitations.

1. Crude Ratio :

It is a crude Ratio because it measures only the quantity and not the quality of current assets.

2. Window Dressing:

Window Dressing is another problem of current ratio. Current assets and liabilities are manipulated in such a way that current ratio loses its significance. Window dressing may be indulged in the following ways :

- Over valuation of closing stock.
- Recording in advance cash receipts applicable to the next year's sales.
- Omission of a liability for merchandise included in inventory.
- Treating a short-term obligation as a long-term liability.
- In-adequate provision for bad and doubtful debts.
- Inclusion in debtors advance payment for purchase of fixed assets.

Window dressing is done to show current ratio at a particular figure. It does not present the real financial position of the concern.

Calculation of current Ratio :

This ratio is calculated by comparing current assets with current liabilities. Take, for example, current assets of a concern as Rs.5,00,000 and current liabilities Rs.2,50,000; Current ratio will be calculated as follows :

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Current Ratio} = \frac{\text{Rs.5,00,000}}{\text{Rs.2,50,000}} = 2.$$

The current Ratio of 2 means that current assets are 2 times of current liabilities. This ratio can also be presented as 2 : 1.

Illustration 1: Calculate current ratio from the following information :

	Rs.		Rs.
Stock	1,20,000	Sundry Creditors	40,000
Sundry Debtors	1,40,000	Bills Payable	30,000
Cash	40,000	Tax Payable	36,000
Bills Receivable	60,000	Outstanding Expenses	14,000
Prepaid Expenses	20,000	Bank overdraft	50,000
Land & Buildings	2,00,000	Debentures	1,50,000
Goodwill	1,00,000		

Solution :

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Current Assets} = \text{Rs. } 1,20,000 + 1,40,000 + 40,000 + 60,000 + 20,000 = \text{Rs. } 3,80,000$$

$$\text{Current liabilities} = \text{Rs. } 40,000 + 30,000 + 36,000 + 14,000 + 50,000 = \text{Rs. } 1,70,000.$$

$$\text{Current Ratio} = \frac{3,80,000}{1,70,000} = 2.24$$

2. Quick or Acid Test or Liquid Ratio :

Quick Ratio also known as Acid Test or Liquid Ratio, is a more rigorous test of liquidity than the current ratio. Quick ratio may be defined as the relationship between liquid assets and liquid liabilities. An asset is said to be liquid if it can be converted into cash with in a short period without loss of value.

$$\text{Quick/Liquid or Acid Test Ratio} = \frac{\text{Quick / Liquid Assets}}{\text{Quick / Liquid Liabilities}}$$

Components of Liquid Assets and Liquid liabilities :

Liquid Assets

Cash in hand

Cash at Bank

Bills Receivable

Sundry Debtors

Marketable Securities

Temporary Investments

Liquid Liabilities

Outstanding Expenses

Bills Payable

Sundry Creditors

Short-term advances

Income tax payable

Dividends payable

Bank Over draft

quick assets can also be calculated as : Current Assets – (Inventories + Prepaid expenses)

Take for example, a concern has liquid assets of Rs.4,00,000 and current liabilities of Rs.3,00,000 the quick Ratio will be :

$$\text{Quick/ Acid Test / Liquid Ratio} = \text{Liquid Assets / Current Liabilities}$$

$$= \frac{\text{Rs. } 4,00,000}{\text{Rs. } 3,00,000} = 1.33$$

Interpretation of Quick Ratio :

Usually, a high acid test ratio is an indication that the firm is liquid and has the ability to met its current or liquid liabilities in time and on the other hand a low quick ratio represents that the firm's liquidity position is not good.

As a rule of thumb quick ratio of 1 : 1 is considered satisfactory.

Significance of Quick Ratio :

The Quick Ratio is very useful in measuring the liquidity position of a firm. It measures the firm's capacity to pay off capacity to pay off current obligations immediately and is a more rigorous test of liquidity than the current ratio. It is used as a complementary ratio to the current ratio.

Illustration 2: Calculate Quick Ratio from the information given as such.

	Rs.		Rs.
Bank Loan	2,00,000	Stock in trade	2,70,000
Sundry Creditors	3,00,000	Sundry Debtors	1,40,000
Bills Payable	40,000	Cash	30,000
Creditors for expenses	20,000	Short-term Investments	3,00,000
6% Debentures	4,00,000	Prepaid Insurance	10,000
Plant & Machinery	6,00,000	Bank	2,20,000

Solution :

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

$$\text{Quick Assets} = \text{Rs. } 1,40,000 + 30,000 + 2,20,000 + 3,00,000 = \text{Rs. } 6,90,000$$

$$\text{Current Liabilities} = \text{Rs. } 3,00,000 + 40,000 + 20,000 = \text{Rs. } 3,60,000$$

$$\text{Quick Ratio} = \frac{\text{Rs. } 6,90,000}{\text{Rs. } 3,60,000} = 1.916.$$

3. Absolute Liquid Ratio or cash Ratio :

Although receivables, debtors and bills receivable are generally more liquid than inventories, yet there may be doubts regarding their realisation into cash immediately or in time. Under this Bills Receivable is excluded from the current assets.

$$\text{Absolute Liquid Ratio} = \frac{\text{Absolute Liquid Assets}}{\text{Current Liabilities}}$$

Or

$$\frac{\text{Cash} + \text{Bank} + \text{Short-term Securities}}{\text{Current Liabilities}}$$

The acceptable norm for this ratio is 50% or 0.5 or 1 : 2 i.e. Rs.1 worth absolute liquid assets are considered adequate to pay Rs.2 worth current liabilities in time as all the creditors are not expected to demand cash at the same time and then cash may also be realised from debtors and inventories.

Illustration 3: Calculate Absolute Liquid Ratio from the following information

	Rs.		Rs.
Good will	1,00,000	Cash at Bank	60,000
Plant & Machinery	8,00,000	Inventories	1,50,000
Trade Investments	4,00,000	Bank O.D.	1,40,000
Marketable Securities	3,00,000	Sundry Creditors	1,20,000
Bills Receivable	80,000	Bills Payable	1,80,000
Cash in hand	90,000	Outstanding expenses	60,000

Solution :

$$\text{Absolute Liquid Ratio} = \frac{\text{Absolute Liquid Assets}}{\text{Current Liabilities}}$$

Absolute Liquid Assets = Marketable securities + cash in hand + cash at bank

$$= \text{Rs. } 3,00,000 + 90,000 + 60,000 = \text{Rs. } 4,50,000$$

Current liabilities = Bank O.D + Sundry Creditors + Bills payable + Outstanding expenses

$$= \text{Rs. } 1,40,000 + 1,20,000 + 1,80,000 + 60,000 = \text{Rs. } 5,00,000$$

$$\text{Absolute liquid Ratio} = \frac{\text{Rs. } 4,50,000}{\text{Rs. } 5,00,000} = 0.9.$$

The ratio of 0.9 is quite satisfactory because it is much higher than the rule of thumb i.e. 0.5.

Illustration 4

The following is the Balance Sheet of New stars Ltd for the year ending Dec 31, 2008.

Liabilities	Rs.	Assets	Rs.
9% Preference share capital	10,00,000	Good will	2,00,000
Equity share capital	20,00,000	Land & Buildings	13,00,000
8% Debentures	4,00,000	Plant	16,00,000
Long-term loan	2,00,000	Furniture & Fixtures	3,00,000
Bills Payable	1,20,000	Bills Receivable	1,40,000
Sundry Creditors	1,40,000	Sundry Debtors	1,80,000
Bank overdraft	60,000	Bank Balance	90,000
Outstanding expenses	10,000	Short term investments	50,000
		Prepaid expenses	10,000
		Stock	60,000
	39,30,000		39,30,000

From the balance sheet calculate :

1. Current Ratio
2. Acid Test Ratio
3. Absolute Liquid Ratio
4. Comment on these Ratios.

Solution :

$$1. \text{ Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Current Assets} = \text{Rs. } 1,40,000 + 1,80,000 + 90,000 + 50,000 + 10,000 + 60,000 = \text{Rs. } 5,30,000$$

$$\text{Current Liabilities} = \text{Rs. } 1,20,000 + 1,40,000 + 60,000 + 10,000 = \text{Rs. } 3,30,000$$

$$\text{Current Ratio} = \frac{\text{Rs. } 5,30,000}{\text{Rs. } 3,30,000} = 1.61$$

$$2. \text{ Acid Test Ratio} = \frac{\text{Liquid Assets}}{\text{Current Liabilities}}$$

$$\text{Liquid Assets} = \text{Rs. } 1,40,000 + 1,80,000 + 90,000 + 50,000 = \text{Rs. } 4,60,000$$

Stock and prepaid expenses have been excluded from current assets in order to arrive at liquid assets.

$$\text{Current Liabilities} = \text{Rs. } 3,30,000$$

$$\text{Acid Test Ratio} = \frac{\text{Rs. } 4,60,000}{\text{Rs. } 3,30,000} = 1.39$$

$$3. \text{ Absolute Liquid Ratio} = \frac{\text{Absolute Liquid Assets}}{\text{Current Liabilities}}$$

$$\text{Absolute Liquid Assets} = \text{Rs. } 90,000 + 50,000 = \text{Rs. } 1,40,000$$

$$\text{Absolute Liquid Ratio} = \frac{\text{Rs. } 1,40,000}{\text{Rs. } 3,30,000} = 0.42.$$

4. Comments :

Current ratio of the company is not satisfactory because the ratio, 1.61, is much below the accepted standard of 2 : 1. Acid – test ratio, on the other hand, is more than the normal standard of 1 : 1. Liquid assets are quite sufficient to provide a cover to the current liabilities. The more rigorous ratio i.e. absolute liquid ratio is slightly low because it is 0.42 whereas the accepted standard is 0.5. In all, the company needs to improve its short-term financial position.

Illustration : 5

Following information is given to you

i. Current Ratio = 2.5

ii. Working capital = Rs.1,80,000

Find out a) current Assets and b) Current liabilities

Solution

Working capital = Current Assets – Current Liability

Current Ratio = Current Assets : Current liabilities

= 2.5 : 1.

Let current liabilities be X then current assets will be 2.5 x

Working capital = 2.5 x – 1.0 x

Rs.1,80,000 – 1.5 x

$$\therefore x = \frac{\text{Rs.1,80,000}}{1.5} = \text{Rs.1,20,000}$$

a) Current Liabilities = Rs.1,20,000

b) Current Assets = Rs.1,20,000 x 2.5 = Rs.3,00,000

Illustration : 6

The following information related to a company:

Current Ratio = 2.5 : 1

Acid – test ratio = 1.5 : 1

Current liabilities = Rs.1,00,000

Find out :

a) Current Assets

b) Liquid Assets

c) Inventory.

Solution :

Current Ratio = Currents Assets/ Current Liabilites

2.5 = Currents Assets/Rs.1,00,000

a) Current Assets = Rs.1,00,000 x 2.5 = Rs.2,50,000

Acid Test Ratio = $\frac{\text{Liquid Assets}}{\text{Current Liabilities}}$

$$1.5 = \frac{\text{Liquid Assets}}{\text{Rs.1,00,000}}$$

$$\text{b) Liquid Assets} = \text{Rs. } 1,00,000 \times 1.5 = \text{Rs. } 1,50,000$$

$$\text{c) Inventory} = \text{Current Assets} - \text{Liquid Assets}$$

$$= \text{Rs. } 2,50,000 - \text{Rs. } 1,50,000$$

$$= \text{Rs. } 1,00,000$$

Illustration 7 : From the given

$$\text{Current Ratio} = 2.8$$

$$\text{Acid - test Ratio} = 1.5$$

$$\text{Working capital} = \text{Rs. } 3,24,000$$

Find out :

$$\text{a) Current Assets}$$

$$\text{b) Current Liabilities}$$

$$\text{c) Liquid Assets}$$

Solution :

Let current liabilities be x

$$\text{Working capital} = \text{Current Assets} - \text{Current Liabilities}$$

$$\text{Rs. } 3,24,000 = 2.8x - 1.0x$$

$$\text{Rs. } 3,24,000 = 1.8x$$

$$\therefore x = \frac{3,24,000}{1.8} = \text{Rs. } 1,80,000$$

$$\text{a) Current Assets} = \text{Rs. } 1,80,000 \times 2.8 = \text{Rs. } 5,04,000$$

$$\text{b) Current liabilities} = \text{Rs. } 1,80,000$$

$$\text{Acid Test Ratio} = \frac{\text{Liquid Assets}}{\text{Current Liabilities}}$$

$$1.5 = \frac{\text{Liquid Assets}}{\text{Rs. } 1,80,000}$$

$$\text{c) Liquid Assets} = \text{Rs. } 1,80,000 \times 1.5 = \text{Rs. } 2,70,000$$

B. Current Assets Movement Ratios :

Current Assets Movement Ratio or Efficiency Ratios are;

1. Inventory/ Stock Turnover Ratio
2. Debtors Turnover Ratio
3. Creditors / Payable Turnover Ratio
4. Working Capital Turnover Ratio.

1. Inventory Turnover or Stock Turnover Ratio :

Every firm has to maintain a certain level of inventory of finished goods so as to be able to meet the requirements of the business. But the level of inventory should neither be too high nor too low. The inventory should not be high because :

- Capital of the concern will be blocked in the form of inventory.
- over-stocking will require more space, so more rent will be paid.
- Stock may become obsolescence.
- Quality of stock may be deteriorated.

On the other hand too low inventory may result in stoppage of work.

Inventory Turnover Ratio also known as stock velocity would indicate whether inventory has been efficiently used or not. The purpose is to see whether only the required minimum funds have been locked up in inventory. Inventory turnover ratio indicates the number of times the stock has been turned over during the period and evaluates the efficiency with which a firm is able to manage its inventory.

For calculating Inventory turnover Ratio the average stock should be taken but not the figure of inventory at the end of the year.

$$\text{Inventory / Stock Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average inventory at cost}}$$

Average inventory is calculated by adding the stock in the beginning and at the end of the period and dividing it by two. If possible, stock figures at the beginning and at the end of every month should be taken and added up and thus should be divided by 13 to get a proper average.

The cost of goods sold may not be known from the published financial statements. In such circumstances, the inventory turnover ratio may be calculated by dividing net sales by average inventory at cost.

$$\text{Thus Inventory Turnover Ratio} = \frac{\text{Net Sales}}{\text{Average Inventory at Cost}}$$

If average inventory at cost is not known then inventory at selling price may be taken as the denominator and where the opening inventory is not known. The closing inventory figure may be taken as the average inventory, Thus :

$$\text{Inventory Turnover Ratio} = \frac{\text{Net Sales}}{\text{Average Inventory at Selling Price}}$$

If Net Sales and Inventory figures are only given in the problem then Inventory Turnover Ratio may be calculated :

$$\text{Inventory Turnover Ratio} = \frac{\text{Net Sales}}{\text{Inventory}}$$

Inventory Conversion period :

It says the average time taken for clearing the stock. This period is calculated by dividing the number of days by inventory turnover. The formula is :

$$\text{Inventory Conversion Period} = \frac{\text{Days in a year}}{\text{Inventory Turnover Ratio}}$$

Illustration 8 :

The cost of goods sold of ABC Ltd., is Rs.10,00,000. The opening stock/inventory is Rs.80,000 and the closing inventory is Rs.1,20,000 (at cost). Find out inventory turnover Ratio.

Solution :

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average Inventory at cost}}$$

$$= \frac{10,00,000}{\frac{80,000 + 1,20,000}{2}}$$

$$= \frac{10,00,000}{1,00,000} = 10 \text{ times.}$$

Illustration 9 :

M/s. Ganesh & Co supplies you the following information for the year ending 31st Dec. 2008 :
Credit Sales : Rs.3,00,000; Cash Sales; Rs.5,00,000; Returns inward : Rs.50,000; Opening Stock; Rs.50,000; Closing Stock Rs.70,000.

Find out 1) Inventory Turnover when Gross Profit Ratio is 20% ii) Inventory conversion period.

Solution :

$$\text{i) Inventory Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average Stock}}$$

Calculation of cost of goods sold :

$$\text{Net Sales} = \text{Rs.3,00,000} + \text{Rs. 5,00,000} - \text{Rs.50,000} = \text{Rs.7,50,000}$$

$$\text{Gross Profit on Sales} = \frac{7,50,000 \times 20}{100}$$

$$= \text{Rs. 1,50,000}$$

$$\text{Cost of goods sold} = \text{Net Sales} - \text{Gross profit}$$

$$= \text{Rs.7,50,000} - \text{Rs.1,50,000}$$

$$= \text{Rs.6,00,000}$$

$$\text{Average Stock} = \frac{\text{Operating Stock} + \text{Closing Stock}}{2}$$

$$= \frac{\text{Rs.50,000} + \text{Rs.70,000}}{2} = \text{Rs.60,000}$$

$$\text{Inventory Turnover} = \frac{\text{Rs.6,00,000}}{\text{Rs.60,000}} = 10 \text{ times}$$

$$\begin{aligned} \text{ii) Inventory conversion period} &= \frac{365}{\text{Inventory Turnover}} \\ &= \frac{365}{10} = 36.5 \text{ or } 37 \text{ days.} \end{aligned}$$

The inventory has been disposed off or sold on an average in 37 days.

Illustration 10:

If Inventory Turnover Ratio is 5 times and average stock at cost is Rs.1,50,000, find out cost of goods sold.

Solution :

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average Inventory at Cost}}$$

$$\begin{aligned} &= \frac{\text{Cost of goods sold}}{\text{Rs.1,50,000}} \\ \text{Cost of goods sold} &= \text{Rs.1,50,000} \times 5 = \text{Rs.7,50,000} \end{aligned}$$

Interpretation of Inventory Turnover Ratio :

Inventory turnover ratio measures the velocity of conversion of stock into sales. A high inventory turnover indicates efficient management of inventory because more frequently the stocks are sold so a lesser amount of money is required to finance the inventory.

There are no rules of thumb or standard inventory turnover ratio for interpreting the inventory turnover ratio. The norms may be different for different firms depending upon the nature of industry and business conditions.

2. Debtors Turnover Ratio :

A concern may sell goods on cash as well as on credit. The volume of sales can be increased by following a liberal credit policy. But the effect of a liberal credit policy may result in tying up substantial funds of a firm in the form of trade debtors. Trade debtors are expected to be converted into cash within a short period and are included in current assets. Hence, the liquidity position of a concern to pay its short-term obligations in time depends upon the quality of its trade debtors. To evaluate the quality of debtors two kinds of ratios are used.

a) Debtors/ Receivables turnover Ratio

b) Average collection period Ratio

a) Debtors / Receivables Turnover Ratio :

Debtors turnover ratio indicates the velocity of debt collection of firm. In simple words, it indicates the number of times average debtors are turned over during a year thus :

$$\text{Debtors Turnover Ratio} = \frac{\text{Net Credit Annual Sales}}{\text{Average Trade Debtors}}$$

= No. of times.

$$\text{Trade Debtors} = \text{Sundry Debtors} + \text{Bills Receivable}$$

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

Note : Debtors should always be taken at gross value. No provision for bad and doubtful debts be deducted from them.

When the information about opening and closing balances of trade debtors and credit sales is not available, then the debtors turnover ratio can be calculated by dividing the total sales by the balance of debtors given.

$$\text{Debtors Turnover Ratio} = \frac{\text{Total Sales}}{\text{Debtors}}$$

Interpretation of Debtors Turnover Ratio :

This Ratio indicates the number of times the debtors are turned over during a year. The higher the value of debtors turnover the more efficient is the management of debtors.

There is no 'rule of thumb' which may be used as a norm to interpret the ratio as it may be different from firm to firm depending upon the nature of business. This ratio should be compared with ratios of other firms doing similar business and a trend may also be found to make a better interpretation of the ratio.

b) Average collection period Ratio :

The average collection period represents the average number of days for which a firm has to wait before its receivables are converted into cash. The ratio can be calculated as follows :

$$\text{Average collection period} = \frac{\text{Average Trade Debtors}}{\text{Sales Per day}}$$

$$\text{Sales per day} = \frac{\text{Net Sales}}{\text{No. of Working days}}$$

Or

$$\text{Average collection period} = \frac{\text{No. of Working Days}}{\text{Debtors Turnover Ratio}}$$

= No. of days.

Illustration : 11

	Rs.
Annual Credit Sales	50,000
Returns	2,000

Debtors

6,000

Bills Receivables

2,000

Find out debtors turnover Ratio :

Solution :

$$\text{Debtor's Turnover Ratio} = \frac{\text{Net Credit Annual Sales}}{\text{Debtors (Incl. B / R)}}$$

$$= \frac{50,000 - 2,000}{6,000 + 2,000}$$

$$= \frac{48,000}{8,000} = 6 \text{ times}$$

Illustration 12 :

Find out a) Debtors Turnover and b) Average collection period from the following information

	31 st Mar. 2007	31 st Mar. 2008
Annual Credit Sales	10,00,000	12,00,000
Debtors in the beginning	1,60,000	1,80,000
Debtors at the end	2,00,000	2,20,000

Days to be taken for the year : 360

Solution :

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

$$\text{Debtors Turnover} = \frac{\text{Net Credit Annual Sales}}{\text{Average Debtors}}$$

	Year 2007	Year 2008
Average Debtors	$= \frac{1,60,000 + 2,00,000}{2}$ = Rs. 1,80,000	$= \frac{1,80,000 + 2,20,000}{2}$ Rs. 2,00,000
a) Debtors Turnover	$= \frac{10,00,000}{1,80,000}$ = 5.56 times	$= \frac{12,00,000}{2,00,000}$ = 6 times.

$$\text{b) Average Collection period} = \frac{\text{No. of Working Days}}{\text{Debtors Turn Over}}$$

	2007	2008
Average collection period	$= \frac{360}{5.56}$	$\frac{360}{6}$
	= 64.7 days	60 days

Interpretation of Average, Collection period Ratio :

The average collection period ratio represents the average number of days for which a firm has to wait before its receivables are converted into cash. It measures the quality of debtors. The shorter the average collection period the better is the quality of debtors. Short collection period implies quick payment of debtors.

There is no 'rule of thumb' or 'standard' which may be used as a norm while interpreting this ratio as the ratio may be different from firm to firm depending upon its credit policy, nature of business and business conditions.

3. Creditors/Payables Turnover Ratio :

In the course of business operations, a firm has to make credit purchases and incur short-term liabilities. Creditor is naturally interested in finding out how much time the firm is likely to take in repaying its trade creditors. Creditors turnover ratio can be calculated in two forms :

$$\text{Creditors Turnover Ratio} = \frac{\text{Annual Net Credit Purchases}}{\text{Average Trade Creditors}}$$

If information about credit purchases is not available, the figure of total purchases may be taken.

Trade creditors include sundry creditors and bills payables.

$$\text{b) Average Payment Period Ratio} = \frac{\text{Average Trade Creditors}}{\text{Average Daily Purchases}}$$

$$\text{Average Daily Purchases} = \frac{\text{Annual Purchases}}{\text{No. of Working Days in a Year}}$$

Or

$$\text{Average Payment Period} = \frac{\text{No. of Working Days}}{\text{Creditors Turnover Ratio}}$$

Note : In case information about credit purchases is not available total purchases may be assumed to be credit purchases.

Interpretation of Average Payment Period Ratio :

The average payment period ratio represents the average number of days taken by the firm to pay its creditors. Lower the ratio, the better is the liquidity position of the firm. Higher ratio implies less liquidity, and also greater credit period enjoyed by the firm and consequently larger the benefit reaped from credit suppliers. To make correct interpretation of this ratio, a comparative analysis of different firms in the same industry and the trend may be found for various years.

Illustration 13 :

From the following information calculate creditors turnover ratio and average payment period :

	Rs.
Total purchases	8,00,000
Cash purchases (included in the above)	1,00,000
Purchase returns	40,000
Creditors at the end	1,20,000
Bills Payable at the end	40,000
Reserve for Discount on creditors	10,000
Take 365 days in a year	

Solution :

$$\text{Creditors Turnover Ratio} = \frac{\text{Annual Net Purchases}}{\text{Average Trade Creditors}}$$

Calculation of Net credit purchases :

	Rs.
Total purchases	8,00,000
<u>Less : Cash purchases</u>	1,00,000
	7,00,000
<u>Less : Returns</u>	40,000
	6,60,000

$$\text{Creditors Turnover Ratio} = \frac{\text{Rs.6,60,000}}{\text{Rs.1,20,000} + 40,000}$$

$$= \frac{\text{Rs.6,60,000}}{\text{Rs.1,60,000}} = 4.13 \text{ times}$$

$$\text{Average payment Period} = \frac{\text{No. of days}}{\text{Creditors Turnover Ratio}}$$

$$= \frac{365}{4.13} = 88 \text{ days}$$

4. Working capital Turnover Ratio = Working capital of a concern is directly related to sales.

Working Capital = Current Assets – Current liabilities

Working capital turnover ratio indicates the number of times the working capital is turned over in the course of a year. This ratio measures the efficiency with which the working capital is being used by a firm.

A higher ratio indicates efficient utilisation of working capital and a low ratio indicates otherwise. But a very high working capital turnover ratio is not a good situation for any firm and hence care must be taken while interpreting the ratio. This ratio can be calculated as :

$$\text{Working Capital Turnover Ratio} = \frac{\text{Cost of Sales}}{\text{Average Working Capital}}$$

$$\text{Average working capital} = \frac{\text{Opening Working Capital} + \text{Closing Working Capital}}{2}$$

Note :

- 1) If the figure of cost of sales is not given, then the figure of sales can be used.
- 2) In the absence of operating working capital the working capital at the year end will be used.

Illustration 14 :

Find out working capital turnover ratio :

	Rs.
Cash	20,000
Bills Receivables	10,000
Sundry debtors	50,000
Stock	40,000
Sundry Creditors	60,000
Cost of sales	1,50,000

Solution :

$$\text{Working capital Turnover Ratio} = \frac{\text{Cost of Sales}}{\text{Net working Capital}}$$

$$\text{Current Assets} = \text{Rs.} 20,000 + 10,000 + 50,000 + 40,000 = \text{Rs.} 1,20,000$$

$$\text{Current liabilities} = \text{Rs.} 60,000$$

$$\begin{aligned} \text{Net working capital} &= \text{Current Assets} - \text{Current liabilities} \\ &= \text{Rs.} 1,20,000 - 60,000 = \text{Rs.} 60,000 \end{aligned}$$

$$\text{Working capital Turnover Ratio} = \frac{\text{Rs.} 1,50,000}{60,000} = 2.5 \text{ times.}$$

Illustration 15 :

The following information is given about M/s. P.N.R. Ltd for the year ending Dec. 31, 2008.

$$\text{Stock turnover Ratio} = 6 \text{ times}$$

$$\text{Gross Profit Ratio} = 20\% \text{ on sales}$$

Sales for 2008 = Rs.6,00,000

Closing Stock is Rs.20,000 more than the opening Stock

Opening Creditors = Rs.40,000

Closing Creditors = Rs.60,000

Trade debtors at the end = Rs.1,20,000

Net working capital = Rs. 50,000

Find out :

a) Average Stock

b) Purchases

c) Creditors Turnover Ratio

d) Average Payment Period

a) Average collection period

b) Working capital turnover Ratio.

Solution :

Cost of good sold = Sales – Gross profit
 = Rs.6,00,000 – 20% of sales
 = Rs.6,00,000 – 1,20,000
 = Rs. 4,80,000

a) Average Stock = $\frac{\text{Cost of goods Sold}}{\text{Stock turnover Ratio}} = \frac{\text{Rs.4,80,000}}{6} = \text{Rs.80,000}$

b) Calculation of purchases :

Cost of goods sold = Opening Stock + Purchases – closing Stock

Purchases = Cost of goods sold + Closing stock – opening stock

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

Since closing stock is Rs.20,000 more than the opening stock so,

$$\text{Rs.80,000} = \frac{\text{Opening Stock} + (\text{Rs.20,000} + \text{Opening Stock})}{2}$$

$$\text{Rs.1,60,000} = 2 \text{ opening stock} + \text{Rs.20,000}$$

$$\text{Opening Stock} = \frac{1,40,000}{2} = \text{Rs.70,000}$$

$$\text{Closing Stock} = 70,000 + 20,000 = \text{Rs.90,000}$$

$$\text{Purchases} = \text{Rs.}4,80,000 + 90,000 - \text{Rs.}70,000 = \text{Rs.}5,00,000$$

$$\text{c) Creditors Turnover Ratio} = \frac{\text{Net Annual Credit Purchase}}{\text{Average Trade Creditors}}$$

$$\text{Creditors Turnover Ratio} = \frac{\text{Rs.}5,00,000}{\left(\frac{\text{Rs.}40,000 + \text{Rs.}60,000}{2} \right)}$$

$$= \frac{\text{Rs.}5,00,000}{\text{Rs.}50,000} = 10 \text{ times}$$

$$\text{d) Average payment period} = \frac{\text{Average Trade Creditors} \times \text{No. of Working Days}}{\text{Net Annual purchases}}$$

$$= \frac{\text{Rs.}50,000}{\text{Rs.}5,00,000} \times 365$$

$$= 36.5 \text{ days or } 37 \text{ days}$$

All purchases are taken as credit purchases.

$$\text{Average collection Period} = \frac{\text{Average Trade Debtors} \times \text{No. of working Days}}{\text{Net Annual sales}}$$

$$\text{e) Average collection Period} = \frac{\text{Rs.}1,20,000 \times 365}{\text{Rs.}6,00,000} = 73 \text{ days}$$

$$\text{f) Working capital Turnover Ratio} = \frac{\text{Cost of goods Sold}}{\text{Net working capital}} = \frac{\text{Rs.}4,80,000}{\text{Rs.}1,00,000} = 4.8 \text{ times}$$

7.5 Long term solvency and leverage Ratio :

The term 'solvency' refers to the ability of a concern to meet its long-term obligations. The long term creditors of a firm are primarily interested in knowing the firm's ability to pay regular interest on long-term borrowings, repayment of principal amount at the maturity and the security of their loans. The following ratios serve the purpose of determining the solvency of the concern :

1) Debt-Equity Ratio :

Debt – Equity Ratio also known as External – Internal Equity Ratio. It is calculated to measure the relative claims of outsiders and the owners against the firm's assets.

$$\text{Debt – Equity Ratio} = \frac{\text{Outsiders Funds}}{\text{Shareholders Funds}}$$

The shareholder's funds consist of equity share capital, preference share capital, capital reserves, revenue reserves and reserves like reserves representing accumulated profits and surpluses for contingencies, sinking fund etc. The accumulated losses and deferred expenses, if any, should be deducted from the total to find out shareholder's funds. This is called Net worth. So this ratio may also be termed as debt to net worth ratio.

Illustration 16 :

Liabilities	Rs.	Assets	Rs.
4,000 Equity shares of Rs.100 each	4,00,000	Fixed Assets	8,00,000
2,000 9% preference Shares of Rs.100 each	2,00,000	Current Assets	4,00,000
2,000 10% Debentures Of Rs.100 each	2,00,000		
Reserves :			
General Reserve	1,00,000		
Reserves for contingencies	1,00,000		
Current liabilities	2,00,000		
	12,00,000		12,00,000

Calculate Debt-Equity Ratio.

Solution :

$$\text{a) Debt - Equity Ratio} = \frac{\text{Outsider's Funds}}{\text{Shareholder's Funds}}$$

$$= \frac{\text{Rs.2,00,000 (Debentures) + 2,00,000 (Current Liabilities)}}{\text{Rs.4,00,000 + 2,00,000 + 1,00,000 + 1,00,000}}$$

$$= \frac{\text{Rs.4,00,000}}{\text{Rs.8,00,000}} = 1 : 2$$

There is a controversy regarding current liabilities. Some writers are of the view that current liabilities do not reflect long-term commitments and hence should be excluded from outsider's funds. The ratio calculated on the basis of outsider's funds excluding current liabilities may be termed as Ratio of long term debt to shareholder's funds, which is :

$$= \frac{\text{Long - term Debt}}{\text{Shareholder's Funds}} = \frac{\text{Rs.2,00,000}}{\text{Rs.8,00,000}} = 1 : 4$$

Interpretation of Debt-Equity Ratio :

The debt – equity ratio is calculated to measure the extent to which debt financing has been used in a business. The ratio indicates the proportionate claims of owners and the outsiders against the firm's assets. The purpose is to get an idea of the cushion available to outsiders on the liquidation of the firm. A ratio of 1 : 1 may be usually considered to be a satisfactory ratio although there cannot be any 'rule of thumb' for all types of businesses. Interpretation of this ratio always depends upon the purpose of analysis, the financial policy and the nature of business of the firm.

2. Funded Debt to Total Capitalisation Ratio :

The ratio establishes a link between the long-term funds raised from outsiders and total long-term funds available in the business.

Funded Debt = Debentures + Mortgage loans + Bonds + Other long-term loans.

Total capitalisation = Equity share capital + Preference share capital + Reserves and surplus + other undistributed Reserves + Debentures + Mortgages loans + Bonds + other long-term loans

Funded debt is that part of total capitalisation which is financed by outsiders.

$$\text{Funded Debt to Total capitalisation Ratio} = \frac{\text{Funded Debt}}{\text{Total Capitalisation}} \times 100$$

There is no 'rule of thumb' but still the lesser the reliance on outsiders the better it will be. If this ratio is smaller, better it will be up to 50% or 55%, this ratio may be tolerable and not beyond.

Illustration 17 :

	Rs.
1,00,000 Equity shares of Rs. 10 each fully paid	10,00,000
40,000 9% preference shares of Rs. 10 each fully paid	4,00,000
General Reserve	1,00,000
Share Premium	50,000
Profit and loss Account	2,50,000
7 ½% Debentures	2,80,000
Mortgage loans	1,20,000
Sundry Creditors	2,58,000
Bills Payable	1,49,000

Findout :

1. Funded Debt to Total capitalisation Ratio.

2. Comment on this ratio.

Solution :

1. Funded Debt to Total Capitalisation Ratio :

$$= \frac{\text{Funded Debt}}{\text{Total Capitalisation}} \times 100$$

Funded Debt = 7 ½% Debentures + Mortgage loans = Rs. 2,80,000 + Rs. 1,20,000 = Rs. 4,00,000

Total capitalization = Proprietors Fund's + Funded Debt

= Equity Share capital + pre. share capital

+ General Reserve + Share premium + P & L A/c + 7 ½% Debentures +
Mortgage loans

= Rs.10,00,000 + 4,00,000 + 1,00,000 + 50,000 + 2,50,000

+ 2,80,000 + 1,20,000

= 22,00,000

$$\text{Funded Debt to Total Capitalisation} = \frac{\text{Rs.4,00,000}}{\text{Rs.22,00,000}} \times 100 = 18.18\%$$

2. The ratio of 18.18% is quite low. The company has not relied much on outside sources for raising long-term funds. There is enough scope for the company to raise long-term loans from outsiders.

3. **Proprietary Ratio or Equity Ratio :**

A variant to the debt-equity ratio is the proprietary ratio which is also known as Equity Ratio. This ratio establishes the relationship between shareholder's funds to total assets of the firm. The ratio of proprietors funds to total funds is an important ratio for determining long-term solvency of a firm. The components of this ratio are shareholders Funds and Total Assets. The shareholder's funds are equity share capital, preference share capital, undistributed profits, reserves and surpluses. Out of this amount, accumulated losses should be deducted.

$$\text{Proprietary Ratio or Equity Ratio} = \frac{\text{Shareholder's Funds}}{\text{Total Assets}}$$

Interpretation of Equity Ratio :

As equity ratio represents the relationship of owner's funds to total assets, higher the ratio better is the long-term solvency position of the company. This ratio indicates the extent to which the assets of the company can be lost without affecting the interest of creditors of the company.

4. **Solvency Ratio or The Ratio of Total Liabilities to Total Assets :**

This ratio is a small variant of equity ratio and can be simply calculated as 100 – equity ratio.

$$\text{Solvency Ratio} = \frac{\text{Total Liabilities to outsiders}}{\text{Total Assets}}$$

Generally, lower the ratio of total liabilities to total assets, more satisfactory or stable is the long-term solvency position of a firm.

5. **Fixed Assets to net worth Ratio or fixed Assets to properitors Funds :**

The ratio establishes the relationship between fixed assets and shareholder's funds i.e. share capital plus reserves, surpluses and retained earnings.

$$\text{Fixed Assets to Net Worth Ratio} = \frac{\text{Fixed Assets (After Depreciation)}}{\text{Shareholder's Funds}}$$

The Ratio of Fixed Assets to net worth indicates the extent to which shareholder's funds are sunk into the fixed assets. The purchase of fixed assets should be financed by shareholder's equity including

reserves surpluses and retained earnings. If the ratio is less than 100% it implies that owner's funds are more than total fixed assets and a part of the working capital is provided by the shareholders. There is no 'rule of thumb' to interpret this ratio but 60 to 65 percent is considered to be satisfactory ratio in case of industrial undertakings.

6. **Fixed Assets to Total Long term Funds or Fixed Assets Ratio :**

A variant to the ratio of fixed assets to net worth is the ratio of fixed assets to total long-term funds which is calculated as :

$$\text{Fixed Assets Ratio} = \frac{\text{Fixed Assets (After Depreciation)}}{\text{Total Long - term Funds}}$$

The long-term funds consists of shareholder's funds as calculated in the debt-equity ratio plus long-term borrowings. Thus, when fixed assets after depreciation are Rs.8,00,000 and total long-term funds are Rs.10,00,000 the fixed assets ratio as a percentage :

$$\frac{8,00,000}{10,00,000} \times 100 = 80\%$$

The ratio indicates the extent to which the total of fixed assets are financed by long-term funds of the firm. Generally the ratio should be 100%. In case, the fixed assets exceed the total of the long-term funds it implies that the firm has financed a part of the fixed assets out of current funds or the working capital which is not a good financial policy. And if the total long-term funds are more than total fixed assets, it means that a part of the working capital requirements is met out of the long-term funds of the firms.

7. **Ratio of Current Assets to proprietor's Funds :**

The ratio is calculated by dividing the total of current assets by the amount of shareholder's funds. For example, if current assets are Rs.4,00,000 and shareholder's funds are Rs.8,00,000 the ratio of current assets to proprietor's funds in terms of percentage would be

$$\begin{aligned} &= \frac{\text{Current Assets}}{\text{Shareholder's Funds}} \times 100 \\ &= \frac{4,00,000}{8,00,000} \times 100 = 50\% \end{aligned}$$

The ratio indicates the extent to which proprietor's funds are invested in current assets. There is no rule 'of thumb' for this ratio and depending upon the nature of the business there may be different ratios for different firms.

8. **Debt Service Ratio or Interest Coverage Ratio :**

Debt service ratio is used to test the debt – servicing capacity of a firm. The ratio is also known as Interest coverage Ratio. This ratio is calculated by dividing the net profit before interest and taxes by fixed interest charges :

$$\text{Debt-service Ratio} = \frac{\text{Net Profit (Before Interest and Taxes)}}{\text{Fixed Interest Charges}}$$

Illustration 18 :

The net profit (after taxes) of a firm is Rs.1,50,000 and its fixed interest charges on long-term borrowings are Rs.20,000. The rate of income-tax is 50%. Calculate interest coverage ratio.

Solution :

$$\begin{aligned} \text{Interest coverage Ratio} &= \frac{\text{Net Profit before Interest \& Taxes}}{\text{Fixed Interest Charges}} \\ &= \frac{1,50,000 + 1,50,000 + 20,000}{20,000} = \frac{3,20,000}{20,000} = 16 \text{ times.} \end{aligned}$$

Interpretation of Interest Coverage Ratio :

Interest coverage Ratio indicates the number of times interest is covered by the profits available to pay the interest charges. Long-term creditors of a firm are interested in knowing the firm's ability to pay interest on their long-term borrowing. Generally, higher the ratio, more safe are the long-term creditors because even if earnings of the firm fall, the firm shall be able to meet its commitment of fixed interest charges. The interest coverage ratio does not take into consideration other fixed obligations like payment of preference dividend and repayment of loan instalments. Therefore, some people suggest total coverage ratio, for this purpose which can be calculated as follows :

$$\text{Total coverage Ratio} = \frac{\text{Net Profit before interest and taxes}}{\text{Total Fixed Charges}}$$

Illustration 19:

A company is currently earning an Earning before interest and tax of Rs.24 lakhs. Its present borrowing are :

	Rs.
11% term loans	80 lakhs
Working Capital :-	
Borrowings from Bank at 16%	66 Lakhs
Public Deposit at 12%	30 Lakhs

The sales of the company are growing and to support this company proposes to obtain an additional bank borrowing of Rs.50 lakhs. The increase in E.BIT is expected to be 20%. Calculate the change in interest coverage ratio after the additional borrowing and comment.

Solution :

Total Interest will be :

	Rs.
11% on term loans of Rs.80 lakhs	8,80,000

16% on Bank Borrowings of Rs.66 lakhs	10,56,000
12% on public Deposits of Rs.30 lakhs	3,60,000
Total Interest	22,96,000

$$\text{Interest coverage Ratio} = \frac{\text{EBIT}}{\text{Total Interest Liability}}$$

$$= \frac{24,00,000}{22,96,000} = 1.045 \text{ Times}$$

After additional borrowing of Rs.50 lakhs, additional interest liability will be

$$\frac{50,00,000 \times 16}{100} = \text{Rs.8,00,000}$$

Total Interest liability will be = 22,96,000 + 8,00,000 = Rs.30,96,000

Earnings Before Interest and Tax will increase by 20%, so EBIT will be

$$= \text{Rs.24,00,000} + 20\% \text{ of Rs.24,00,000}$$

$$= \text{Rs.24,00,000} + 4,80,000 = \text{Rs.28,80,000}$$

$$\text{New Interest Coverage Ratio} = \frac{\text{Rs.28,80,000}}{\text{Rs.30,96,000}} = 0.93 \text{ times}$$

Comment: With the additional bank loan interest coverage ratio will be reduced by 0.115 times (1.045 – 0.93). So, additional borrowings is not advisable.

9. Cash to Debt Service Ratio :

Cash to debt service ratio is an improvement over the interest coverage ratio and is calculated as follows :

Cash to Debt service Ratio =

Or

$$\text{CFCD} = 1 + \frac{\text{SFD}}{1 - T}$$

Where CF = Annual Cash Flow before interest and tax

I = Interest charges

SFD = Sinking Fund Appropriation on Debt

T = Rate of Tax

The logic of the ratio is that the interest payments are to be made out of cash inflow of the business and not profits and apart from interest expenses sinking fund appropriations on debt (to make repayment of the loans) should be considered to find out debt cash flow coverage as a measure of long-term solvency of a firm. Generally, higher the coverage better it is, as far as, long-term solvency of the firm is concerned.

Illustration 20 : Calculate cash to debt service ratio.

Net Profit after tax	= Rs.45,000
Fixed Interest Charges	= Rs. 4,000
Depreciation Charges	= Rs. 6,000
Tax Rate	= 50%
Sinking Fund Appropriation	= 7 ½ % of outstanding Debentures
10% Debentures	= Rs.40,000

Solution :

$$\text{Debt cash Flow coverage (CFCD)} = 1 + \frac{\text{CF}}{\frac{\text{SFD}}{1 - T}}$$

$$= \frac{45000 + 45000 + 4000 + 6000}{4000 + \frac{3000}{1 - \frac{50}{100}}}$$

$$= \frac{1,00,000}{4,000 + \left(\frac{3,000}{0.5}\right)} = \frac{1,00,000}{4,000 + \left(\frac{3,000 \times 10}{5}\right)}$$

$$= \frac{1,00,000}{4,000 + 6,000} = \frac{1,00,000}{10,000} = 10 \text{ times.}$$

7.6 Profitability Ratios

The primary objective of a business undertaking is to earn profits. A business enterprise can discharge its obligations to the various segments of the society only through earning of profits. Profits are thus, a useful measure of overall efficiency of a business. Profits are an index of economic progress. Profitability ratios are calculated to measure the over all efficiency of the business. Generally profitability ratios are calculated either in relation to sales or in relation to investment. The various profitability ratios are :

7.6.1 General profitability Ratios :

The following ratios are known as general profitability ratios :

- 1) Gross Profit Ratio
- 2) Operating Ratio

3) Operating Profit Ratio

4) Expenses Ratio

5) Net-profit Ratio

7.6.1.1 Gross Profit Ratio :

Gross profit ratio measures the relationship of gross profit to net sales and is usually represented as a percentage

$$\begin{aligned}\text{Gross Profit Ratio} &= \frac{\text{Gross Profit}}{\text{Net Sales}} \times 100 \\ &= \frac{\text{Sales} - \text{Cost of goods sold}}{\text{Sales}} \times 100\end{aligned}$$

Illustration 21 :

Calculate gross profit Ratio :

	Rs.
Total sales	= 10,40,000
Sales Returns	= 40,000
Cost of goods sold	= 8,00,000

Solution :

$$\begin{aligned}\text{Gross Profit Ratio} &= \frac{\text{Gross Profit}}{\text{Net Sales}} \times 100 \\ \text{Net sales} &= \text{Total sales} - \text{Sales Returns} \\ &= \text{Rs. } 10,40,000 - 40,000 = 10,00,000 \\ \text{Gross profit} &= \text{Net sales} - \text{Cost of goods sold} \\ &= \text{Rs. } 10,00,000 - 8,00,000 \\ &= \text{Rs. } 2,00,000 \\ \text{Gross Profit Ratio} &= \frac{2,00,000}{10,00,000} \times 100 \\ &= 20\%\end{aligned}$$

Interpretation of Gross Profit Ratio :

The Gross profit ratio indicates the extent to which selling prices of goods per unit may decline without resulting in losses on operation of a firm. It reflects the efficiency with which a firm produces its products. There is no standard norm for gross profit ratio and it may vary from business to business but the gross profit should be adequate to cover the operating expenses and to provide for fixed charges, dividends and accumulation of reserves.

7.6.1.2 Operating Ratio :

Operating ratio establishes the relationship between cost of goods sold and other operating expenses on the one hand and the sales on the other.

$$\begin{aligned}\text{Operating Ratio} &= \frac{\text{Opening Cost}}{\text{Net Sales}} \quad 5 \quad 100 \\ &= \frac{\text{Cost of goods sold} + \text{Operating expenses}}{\text{Net Sales}} \quad 5 \quad 100\end{aligned}$$

Operating cost = Cost of goods + Operating expenses

Operating expenses = Administrative expenses + Selling and distribution expenses.

Illustration 22 :

Find out operating ratio :

	Rs
Cost of goods sold	7,00,000
Selling & Distribution expenses	40,000
Administrative & office expenses	60,000
Net sales	10,00,000

Solution :

$$\begin{aligned}\text{Operating Ratio} &= \frac{\text{Cost of goods sold} + \text{Operating expenses}}{\text{Net Sales}} \quad 5 \quad 100 \\ &= \frac{7,00,000 + 40,000 + 60,000}{10,00,000} \quad 5 \quad 100 \\ &= \frac{8,00,000}{10,00,000} \quad 5 \quad 100 = 80\%\end{aligned}$$

The ratio indicates that 80% of the sales have been consumed by operating cost i.e.; cost of goods sold and operating expenses and only 20% is left to cover interest charge, Income-tax Payment, dividend and the retention of profits as reserves.

Interpretation of operating Ratio :

Operating ratio indicates the percentage of net sales that is consumed by operating cost. Obviously, higher the operating ratio, the less favourable it is. There is no rule of thumb for this ratio as it may differ from firm to firm depending upon the nature of its business and its capital structure.

7.6.1.3 Operating Profit Ratio :

This ratio is calculated by dividing operating profit by sales. Operating profit is calculated as :

Operating profit = Net sales – operating cost

Or

Operating profit = Net profit + Non-operating expenses – Non-operating income

Operating profit Ratio = $\frac{\text{Operating Profit}}{\text{Sales}} \times 100$

Illustration 23 :

From the information given below, calculate operating profit ratio :

Cost of goods sold = Rs. 8,00,000

Administrative & office expenses = Rs. 70,000

Selling & Distribution expenses = Rs. 90,000

Net sales = Rs. 12,00,000

Solution:

Operating Profit Ratio = $\frac{\text{Operating Profit}}{\text{Net Sales}} \times 100$

Operating Profit = Sales – (Cost of goods sold + Administrative office expenses + selling & Distributive expenses)
 = Rs.12,00,000 – (Rs.8,00,000 + Rs.70,000 + Rs.90,000) = Rs.2,40,000

Operating Profit Ratio = $\frac{2,40,000}{12,00,000} \times 100 = 20\%$

7.6.1.4 Expenses Ratio :

Expenses ratio indicates the relationship of various expenses to net sales. The operating ratio reveals the average total variations in expenses. But some of the expenses may be increasing while some may be falling. Hence, expense ratios are calculated by dividing each item of expenses or groups of expenses with the net sales to analyse the causes of variation of the operating ratio.

Particular expense Ratio = $\frac{\text{Particular expense}}{\text{Net Sales}} \times 100$

For example

Administrative & office Expenses Ratio = $\frac{\text{Administrative \& Office expenses}}{\text{Sales}} \times 100$

7.6.1.5 Net Profit Ratio

Net profit ratio establishes a relationship between net profit (after taxes) and sales, and indicates the efficiency of the management in manufacturing, selling, administrative and other activities of the firm. This ratio is the overall measure of firm's profitability.

$$\text{Net profit Ratio} = \frac{\text{Net Profit after Tax}}{\text{Net Sales}} \quad 5 \text{ } 100$$

This ratio is very useful as if the profit is not sufficient, the firm shall not be able to achieve a satisfactory return on its investment. This ratio also indicates the firm's capacity to face adverse economic conditions such as price competition, low demand etc. Obviously higher the ratio, the better is the profitability.

7.6.1.6 Cash Profit Ratio :

The net profits of a firm are affected by the method of depreciation charged. Depreciation is a non-cash expense. Hence, it is better to calculate cash profit ratio. This ratio measures the relationship between cash generated from operations and the net sales. Thus

$$\text{Cash Profit Ratio} = \frac{\text{Cash Profit}}{\text{Net Sales}} \quad 5 \text{ } 100$$

Where, cash Profit = Net Profit + Depreciation.

Illustration 24 :

Following is the profit and loss Account of PNR Ltd for the year ended 31st December, 2008.

Dr	Rs.		Cr	Rs.
To Opening Stock	2,00,000	By Sales		11,20,000
To Purchases	7,00,000	By Closing Stock		2,00,000
To Wages	18,000			
To Gross Profit	4,02,000			
	<u>13,20,000</u>			<u>13,20,000</u>
To Administrative Expenses	40,000	By Gross Profit		4,02,000
To Selling & Distribution expenses	1,78,000	By Interest on Investments		20,000
To Non operating expenses	60,000	By Profit on sale of Investments		16,000
To Net Profit	1,60,000			
	<u>4,38,000</u>			<u>4,38,000</u>

You are required to calculate :

1. Gross Profit Ratio
2. Net Profit Ratio
3. Operating Ratio
4. Operating Profit Ratio
5. Administrative Expenses Ratio

Solution :

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

$$= \frac{4,02,000}{11,20,000} \times 100 = 35.9\%$$

$$2. \text{ Net profit Ratio} = \frac{\text{Net Profit (after tax)}}{\text{Net Sales}} \times 100$$

$$= \frac{1,60,000}{11,20,000} \times 100 = 14.3\%$$

$$3. \text{ Operating Ratio} = \frac{\text{Cost of goods sold} + \text{Operating exp.}}{\text{Net Sales}}$$

$$\text{Cost of goods sold} = \text{Opening Stock} + \text{Purchases} + \text{Wages} - \text{Closing Stock}$$

$$= 2,00,000 + 7,00,000 + 18,000 - 2,00,000 = 7,18,000$$

$$\text{Operating expenses} = \text{Administrative} + \text{Selling \& Distribution expenses}$$

$$= \text{Rs.}40,000 + 1,78,000 = \text{Rs.}2,18,000$$

$$\text{Operating Ratio} = \frac{7,18,000 + 2,18,000}{11,20,000} \times 100$$

$$= \frac{9,36,000}{11,20,000} \times 100 = 83.6\%$$

$$4. \text{ Operating Profit Ratio} = 100 - \text{Operating Ratio} = 100 - 83.6\% = 16.4\%$$

$$5. \text{ Administrative expenses Ratio} = \frac{\text{Administrative Expenses}}{\text{Net Sales}} \times 100$$

$$= \frac{40,000}{11,20,000} \times 100 = 3.6\%$$

7.6.2 Overall Profitability Ratios :

Profits are the measure of overall efficiency of a business. The higher the profits, the more efficient is the business considered. Overall profitability or efficiency of a business can be measured in terms of profits related to investments made in the business. Following are the important overall profitability ratios.

7.6.2.1 Return on shareholder's Investment or Net worth :

Return on shareholder's Investment is the relationship between net profits and the proprietor's funds. Thus,

$$\text{Return on shareholder's Investment} = \frac{\text{Net Profit (after Interest \& Tax)}}{\text{Shareholder's Funds}}$$

$$\text{Shareholders Funds} = \text{Equity share capital} + \text{Preference Share capital} + \text{Reserves \& surplus} - (\text{Accumulated losses, if any})$$

Illustration 25 :

Issued and subscribed capital :

	Rs.
4,000 equity shares of Rs.100 each	4,00,000
2,000 8% preference shares of Rs.100 each	2,00,000
Reserves & surplus :	
Revenue Reserve	60,000
Capital Reserve	1,00,000
Reserve for contingencies	40,000
Net Profit before interest & Tax	3,00,000
Interest Charges	60,000
Tax Rate 50%	
Calculate return on shareholder's investment.	

Solution :

Shareholders Investments :

$$\begin{aligned} &\text{Equity Share capital} + \text{Preference Share Capital} + \text{Reserves \& Surplus} \\ &= \text{Rs.}4,00,000 + 2,00,000 + 2,00,000 = \text{Rs.}8,00,000 \end{aligned}$$

	Rs.
Net Profit before Interest & tax	3,00,000
<u>Less : Interest</u>	<u>60,000</u>
	2,40,000
<u>Less : Income tax @ 50%</u>	<u>1,20,000</u>
Net Profit after Interest & tax	<u>1,20,000</u>

$$\text{Return on shareholder's Investment} = \frac{\text{Net Profit after Interest \& Tax}}{\text{Shareholder's Investment}}$$

$$= \frac{1,20,000}{8,00,000} \times 100 = 15\%$$

Interpretation :

This ratio is one of the most important ratios used for measuring the overall efficiency of a firm. As the primary objective of business is to maximise its earnings, this ratio indicates the extent to which this primary objective of business is being achieved. This ratio can be compared with the return of other similar firms in the same industry.

7.6.2.2 Return on Equity Capital :

Equity shareholders are the real owners of the company. They assume the highest risk in the company. The rate of dividend to equity shareholders varies with profits. Thus, equity shareholders are more interested in the profitability of a company.

$$\text{Return on Equity capital} = \frac{\text{Net Profit after tax} - \text{Preference dividend}}{\text{Equity Share Capital (paid up)}}$$

Illustration 26 :

20,000 Equity shares of Rs.10 each Rs.8 paid = Rs.1,60,000

11% 5,000 preference shares of Rs.20 each = Rs.1,00,000

Profit before tax = Rs.1,60,000

Rate of tax = 50%

Calculate Return on Equity capital

Solution:

$$\text{Return on Equity Capital} = \frac{\text{Net Profit after Tax} - \text{Preference dividend}}{\text{Equity Share Capital (paid up)} \times 100}$$

Profits available for equity shareholders :

	Rs.
Profits	1,60,000
Less Tax @ 50%	80,000
Profit After tax	80,000
Less : Preference dividend	22,000
	58,000

$$\begin{aligned} \text{Return on Equity capital} &= \frac{\text{Rs.58,000}}{\text{Rs.1,60,000}} \times 100 \\ &= 36.25\% \end{aligned}$$

This ratio is more meaningful to the equity shareholders who are interested to know profits earned by the company and those profits which can be made available to pay dividend to them.

7.6.2.3 Earning Per share (E.P.S.)

Earnings per share is a small variation of return on equity capital and is calculated by dividing the net profit after tax and preference dividend by the total number of equity shares. Thus,

$$\text{EPS} = \frac{\text{Net Profit after tax} - \text{Preference Dividend}}{\text{No. of Equity Shares}}$$

7.6.2.4 Capital Turnover Ratio :

Capital turnover ratio is the relationship between cost of goods sold and the capital employed. This ratio is calculated to measure the efficiency or effectiveness with which a firm utilise its resources or the capital employed. This ratio is calculated to measure the efficiency or effectiveness with which a firm utilize its resources or the capital employed. This ratio is a good indicator of overall profitability of a concern.

$$\text{Capital Turnover Ratio} = \frac{\text{Cost of goods sold or Sales}}{\text{Capital Employed}}$$

Capital employed in a business consists of investment in i) Fixed assets, and ii) working capital; Hence, capital turnover ratio can be classified as :

- i) Fixed Assets Turnover and,
- ii) Working Capital Turnover

Fixed assets turnover is the relationship between sales or cost of goods sold and fixed capital assets employed in a business. Working capital turnover ratio indicates the velocity of the utilisation of net working capital.

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Cost of goods sold or sales}}{\text{Fixed Assets / Capital Employed}}$$

$$\text{Working capital Turnover Ratio} = \frac{\text{Cost of goods sold or Sales}}{\text{(Average) Working Capital}}$$

7.7 Leverage Ratios :-

The term 'Capital Structure' refers to the relationship between various long-term forms of financing such as debentures, preference share capital and equity share capital including reserves and surplus. Leverage or capital structure ratios are calculated to test the long-term financial position of a firm. Following ratios are generally calculated to analyse the capital structure of a firm.

7.7.1 Capital Gearing Ratio :

The term, capital gearing is used to describe the relationship between equity share capital including reserves and surpluses to preference share capital and other fixed interest – bearing loans.

If preference share capital and other fixed interest bearing loans exceed the equity share capital including reserves, the firm is said to be highly geared.

$$\text{Capital gearing Ratio} = \frac{\text{Equity capital + Reserves \& Surplus}}{\text{Preference Capital + long – term debt Bearing fixed interest}}$$

Capital gearing Ratio can also be calculated as below :

$$\text{Capital gearing Ratio} = \frac{\text{Fixed Income bearing Funds}}{\text{Equity shareholder's Funds}}$$

$$\text{Or } \frac{\text{Fixed Income bearing Funds}}{\text{Total Capital Employed}}$$

Illustration 27 : From the information given as under findout capital gearing Ratios.

	2007	2008
Equity Share Capital	10,00,000	8,00,000
Reserves & Surplus	6,00,000	4,00,000
8% preference share capital	5,00,000	6,00,000
6% Debentures	5,00,000	8,00,000

Solution ;

$$\text{Capital Gearing Ratio} = \frac{\text{Equity share capital + Reserve \& Surplus}}{\text{Preference Capital + long - term debt bearing fixed int erest}}$$

$$2007 = \frac{10,00,000 + 6,00,000}{5,00,000 + 5,00,000} = 8 : 5 \text{ (Low gear)}$$

$$2008 = \frac{8,00,000 + 4,00,000}{6,00,000 + 8,00,000} = 6 : 7 \text{ (High Gear)}$$

Capital gearing ratio is very important leverage ratio. High gearing ratio is not good.

Leverage may be classified as :

- Financial leverage
- operating leverage
- Combined leverage

a) Financial leverage or Trading on Equity :

It is calculated as follows :

$$\text{Financial leverage} = \frac{\text{Earnings Before Interest \& Tax (EBIT)}}{\text{EBIT - Interest \& Preference dividend}}$$

b) Operating leverage :

It is obtained by dividing contribution i.e; sales minus variable cost, by the EBIT i.e. earnings before interest and tax. Thus :

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

c) Combined leverage :

Financial leverage x operating leverage

Illustration : 28

Calculate 1) Operating leverage 2) Financial leverage 3) Composite leverage from the following figures :

	Original	After an increase of 20% in sales
Sales (40,000 units @ Rs.10)	4,00,000	4,80,000
Variable cost (Rs.6 per unit)	2,40,000	2,88,000
Fixed cost	1,20,000	1,20,000
EBIT	40,000	72,000
Less : Interest	10,000	10,000
Profit before tax	30,000	62,000
Tax at 50%	15,000	31,000
Profit After Tax	15,000	31,000

Solution :

Contribution = Sales – Variable cost

	Original	After an increase of 20% in sales.
Contribution	= 4,00,000 – 2,40,000 = Rs.1,60,000	4,80,000 – 2,88,000 = Rs.1,92,000

1) Operating leverage

$$= \frac{\text{Contribution}}{\text{EBIT}} = \frac{1,60,000}{40,000} = 4 \quad \frac{1,92,000}{72,000} = 2.67$$

2. Financial leverage =

$$\frac{\text{EBIT}}{\text{EBIT} - \text{Interest}} = \frac{40,000}{30,000} = 1.33 \quad \frac{72,000}{62,000} = 1.16$$

3. Composite leverage = 1.33 x 2.67 = 3.54**7.7.2 Debt Equity Ratio**

This ratio has been discussed earlier.

$$\text{7.7.3 Total Investment to long-term Liabilities} = \frac{\text{Shareholder's Fund} + \text{Long-term Liabilities}}{\text{Long-term Liabilities}}$$

As a general rule it should not be very high.

7.7.4 Ratio of Fixed Assets to Funded Debt :

The ratio measures the relationship between the fixed assets and the funded debt and is a very useful to the long-term creditors. The ratio can be calculated as below :

$$\text{Ratio of Fixed Assets to Funded debt : } \frac{\text{Fixed Assets}}{\text{Funded Debt}}$$

7.7.5 Ratio of current Liabilities to proprietor's Funds :

The ratio of current liabilities to proprietors funds establishes the relationship between current liabilities and the proprietor's funds and indicates the amount of long-term funds raised by the proprietors as against short-term borrowings.

7.7.6 Ratio of Reserves to Equity Capital :

$$= \frac{\text{Reserves}}{\text{Equity share Capital}} \times 100$$

The ratio establishes relationship between Reserves and Equity share capital. The ratio indicates that how much profits are generally retained by the firm for future growth. Higher the ratio, generally, better is the position of firm.

DU-Pont Control Chart :

A system of management control designed by an American company named Du-pont company is popularly called Du-Pont control chart. This system uses the ratio inter-relationship to provide charts for managerial attention. The standard ratios of the company are compared to present ratios and changes in performance are judged.

$$\text{The ratio} = \frac{\text{Profit Margin}}{\text{Capital Employed}} \times 100$$

The efficiency of a concern depends upon the working operations of the concern. The return on investment becomes a yardstick to measure efficiency because return influences various operations. The profit margin will show the efficiency with which assets of the business have been used.

7.8 Summary :-

Different people analyse Ratios for different purposes. The supplier of the concern interested in liquidity of the concern, Long-term creditors are interested in solvency Ratios, Shareholders are interested in the profitability of the concern.

7.9 Self Assessment Questions

1. What is meant by ratio analysis ? Discuss its objects and limitations.
2. What is the significance of ratios.
3. What are the limitations of ratio analysis ?
4. What are liquidity ratios ? Discuss their significance.

5. What is the need for calculating Turnover Ratios ?
6. What are the important profitability Ratios ? How are they worked out ? Explain and Illustrate.
7. Explain different leverages.
8. Write detailed note on capital employed.

7.10 Exercises

1. Following is the Balance sheet of Murthy & Co as on 31.12.2008.

Liabilities	Rs.	Assets	Rs.
Equity shares of Rs.10 each	2,00,000	Good will	1,00,000
Reserves	50,000	Fixed Assets	3,00,000
Profit & Loss A/c	80,000	Stock	80,000
Secured loan	1,40,000	Sundry Debtors	1,00,000
Sundry Creditors	1,00,000	Less : Reserve	2,000
Bank Overdraft	60,000	Advances	20,000
Provision for Taxation	40,000	Bank Balance	40,000
		Cash in Hand	32,000
	6,70,000		6,70,000

Calculate :

1. Current Ratio 2. Liquid Ratio 3. Absolute liquid Ratio

(Ans : 1) 1.35 2) 0.95 3) 0.36)

2. From the following particulars calculate current ratios.

Stock	2,40,000	Bills Payable	60,000
Debtors	1,40,000	Taxes payable	72,000
Cash	80,000	Expenses payable	28,000
Bills Receivable	1,20,000	Bank Overdraft	1,00,000
Prepaid expenses	40,000	Debentures	3,00,000
Land & Buildings	4,00,000	Plant & Machinery	2,00,000
Good will	2,00,000	Mortgaged loans	2,00,000
Creditors	80,000	Furniture	30,000

(Ans : 2.24)

3. Following information is obtained from the books of Madhu enterprises.

Balance Sheet

Liabilities	Rs.	Assets	Rs.
Equity share capital	15,00,000	Goodwill	1,50,000
5% Preference Share Capital	7,50,000	Land & Buildings	9,75,000
9% Debentures	3,00,000	Plant	12,00,000
Long term creditors	1,50,000	Furniture	2,25,000
Bills Payable	90,000	Bills Receivable	1,05,000
Creditors	1,05,000	Debtors	1,35,000
Bank O.D.	45,000	Bank balance	67,500
Expenses Payable	7,500	Short term investments	37,500
		Prepaid expenses	7500
		Stock	45,000
	29,47,500		29,47,500

On the basis of the above Balance sheet, calculate

1. Current Ratio 2. Absolute Liquid Ratio 3. Acid test Ratio 4. Comment on the Ratios.

4. From the following particulars calculate a) Current Assets b) Current liabilities

- 1) Current Ratio = 2.5
2) Working Capital = Rs.7,20,000

5. The following information is related to a company.

Current Ratio = 2.5

Acid test Ratio = 1.5

Current liabilities = Rs.10,00,000

Calculate the following

- 1) Current Liabilities 2) Liquid Assets 3) Stock Value.

6. Calculate the Inventory turn-over Ratio from the following :-

Cost of goods sold Rs.1,00,00,000

Opening Stock Rs. 8,00,000

Closing Stock Rs. 12,00,000

7. The following information is related to M/s Vasu & Co.

Rs.

Credit Sales 30,00,000

Cash Sales	50,00,000
Sales Returns	5,00,000
Opening Stock	5,00,000
Closing Stock	7,00,000

1) Calculate stock Turnover Ratio if Gross Profit Ratio is 20%.

2) Calculate stock turnover period.

8. A Trader purchases stock both on cash and for credit. The information obtained from his books is:

	Rs.
Total purchases	18,00,000
Cash purchases	1,80,000
Purchase Returns	3,06,000
Closing Creditors	6,30,000
Closing Bills payables	3,60,000
Provision for discount on creditors	48,000
Calculate Average Payment period.	

9. From the following particulars calculate 1) Creditor's turnover Ratio 2) Payment period.

	2007	2008
	Rs.	Rs.
Credit Sales	3,40,000	3,75,000
Opening Creditors	40,000	30,000
Closing Creditors	30,000	45,000
Days in an year = 360.		

10. Anil enterprises is supplying the following information.

	Rs.
Cash Sales in the year	6,00,000
Credit Sales in the year	10,80,000
Sales Returns	80,000
Opening Debtors	2,20,000
Closing Debtors	1,80,000
Provision for Bad debts	20,000

Calculate :

- 1) Debtors turnover ratio
- 2) Average collection period
- 3) Days in the year = 360

11. **The following is the Trading & Profit & Loss Account of Ajay enterprises for the year ending 31.3.2008.**

Trading & Profit & Loss Account

Dr	Rs.	Rs.	Cr
To Opening Stock	3,05,000	By Sales	20,00,000
To Purchases	12,61,000	By Closing Stock	3,94,000
To Factory expenses	28,000		
To Gross Profit	8,00,000		
	<u>23,94,000</u>		<u>23,94,000</u>
To Administration Expenses	4,04,000	By G. profit	8,00,000
To Selling & Distribution expenses	48,000	By Non-operating Income	24,000
To Non operating expenses	36,000		
To Net Profit	3,36,000		
	<u>8,24,000</u>		<u>8,24,000</u>

Calculate the following Ratios :

- 1) Expenses Ratio 2) Administration Ratio 3) Gross Profit Ratio
 - 4) Net Profit Ratio 5) Operating profit Ratio
12. **Madhuri enterprises books are exhibiting the following figures. Calculate the following on 31-3-2008.**

- 1) Average stock, 2) Purchases, 3) Average repayment period, 4) Average collection period ,
- 5) Creditors turnover Ratio, 6) Working capital Ratio.

	Rs.
Debtors closing balance	3,60,000
Creditors Opening balance	1,00,000
Creditors closing balance	1,80,000
Working capital	4,80,000
Stock turnover ratio	5 times

Sales in 2008

20,00,000

Gross Profit on sales is 20%.

13. Gopi & Co information is given below.

Rs.

Profit after 50% tax

9,00,000

Market value of Equity share = Rs.150

Depreciation

1,20,000

A dividend of 20% was paid on equity shares. Equity capital is Rs.12,00,000; Face value of share is Rs.30/- preference share capital Rs.6,00,000

Calculate the following.

1. Dividend yield on Equity shares
2. Cover for preference and Equity Dividend
3. Earning per share.
4. Price Earning Ratio.

14. The following is the Balance Sheet of Pranav & Co Ltd., on 31.3.2008.

Balance Sheet

Liabilities	Rs.	Assets	Rs.
		Good will	2,50,000
Equity Share Capital each @ Rs.10	10,00,000	Plant & Machinery	12,50,000
Preference share capital	5,00,000	Furniture	3,50,000
Reserves	2,50,000	Investments	7,50,000
Dividend equalisation Reserve	3,00,000	Cash	1,00,000
P & L A/c	2,00,000	Debtors	6,25,000
5% Debentures	7,50,000	Bills Receivable	3,25,000
7% Mortgage loan	3,50,000	prepaid taxes	1,00,000
Creditors	2,50,000		
Bank loan	1,50,000		
	37,50,000		37,50,000

Calculate the following :

1. Debt – equity Ratio
2. Proprietary Ratio
3. Solvency Ratio

4. Net value – Fixed Assets Ratio

5. Proprietary Funds – Current Assets Ratio.

15. The following information is obtained from the books of M/s. Jahnvi & Co.

Production & Sale in units	80,000
Sales	38,40,000
<u>Less : Variable costs</u>	22,40,000
Contribution	16,00,000
<u>Less : Fixed expenses</u>	9,60,000
	6,40,000
<u>Less: Interest</u>	2,40,000
Profit before tax	4,00,000
<u>Less : Tax</u>	2,00,000
Profit After tax	2,00,000

Calculate

1. Operating leverage 2) Financial leverage 3) Combined leverage

7.11 Reference books

- | | | |
|---------------------|---|--|
| 1. Sharma, Gupta | – | Management Accounting. |
| 2. I.M. Pande | - | Management Accounting |
| 3. Manmohan & Goyal | – | Principles of Management Accounting. |
| 4. Hom Green | - | Introduction to Management Accounting. |

- Dr. Ch. Suravinda

Lesson - 8

COSTING TECHNIQUES

- 8.1 Introduction**
- 8.2 Features**
- 8.3 Cost Accumulation**
- 8.4 Cost Sheet or Statement of Cost**
- 8.5 Advantages of Cost Sheet**
- 8.6 Specimen of Cost Sheet**
- 8.7 Tenders or Quotations**
- 8.8 Examples**
- 8.9 Exercise**
- 8.10 Summary**
- 8.11 Terminology**
- 8.12 Self Assessment Questions**
- 8.13 Reference Books**

8.1 Introduction

There are only two basic methods of costing. They are (1) specific order costing and (2) operation costing.

Operation Costing : “The category of basic costing methods applicable where standardised goods or services result from a sequence of repetitive and more or less continuous operations or processes to which costs are charged before being averaged over the units produced during the period”.

From the above, unit costing is also known as single costing, output costing.

8.2 Features

Unit costing is a method of costing by unit of production. It is adopted by concerns producing a single article on a large scale, by a continuous process of manufacture, and all the units produced are identical and homogeneous. The units of production are capable of being expressed in convenient units of measurements. In a large number of cases, the unit of measurement will itself be the cost unit. Where this is not possible, convenient units are chosen from the cost accounting point of view.

The popular cost units are: one unit, 1000 units, one gross, a litre, a tonne, a bag, a kilogram etc. The cost per unit is arrived at by dividing the total cost by the total quantity or the number of units produced.

8.3 Cost Accumulation

Under this method of costing, costs are accumulated and analysed under the various elements and the total of each element is divided by the total number or the quantity produced. It is only when the article is produced in different grades or sizes, a detailed analysis of expenditure might become necessary.

Materials : Materials consumed is ascertained by adopting the normal stores procedure. To ensure the availability of materials for continuous flow of production and to prevent over or under-stocking, stock levels should be set and re-order quantity determined. Issues should be made against authorised requisitions only.

Analysis of the requisitions will give us the quantity of direct and indirect materials issued for production and their values also. Normal loss should be recovered by inflating the issue rate. Abnormal losses should be charged to the costing profit and loss account.

Labour : For purposes of accounting and control of labour cost, it is necessary to record the timing of arrival and departure of workers. The labour costs are collected periodically through payrolls which are prepared separately for each section of the work. Labour-direct and indirect should be identified separately. The direct labour costs are collected separately and forms a part of prime cost where as indirect labour is charged to the factory overheads.

Overheads : The financial records, which give the details of actual overhead expenses incurred are analysed under manufacturing and administrative overheads selling and distribution overheads and added to prime cost. These are usually charged at predetermined rates.

Treatment of Scrap : Materials drawn from stores but rendered useless for production, or the residue in the course of manufacture, are known as scrap. Scrap includes broken, spoiled or materials which have not undergone processing. Scrap returned to stores or sold reduces the cost of materials consumed. Cost of scrap has to be deducted from the works cost on the basis of the sale value.

8.4 Cost Sheet or Statement of Cost

Cost sheet is a statement designed to show the output of a particular accounting period alongwith the break-up of costs. The data incorporated in cost sheet are collected from various statements of accounts which have been written in cost accounts, either day-to-day or regular records.

There is no fixed form for preparation of cost sheet but in order to make the cost sheet more useful it is generally presented in columnar form. The information to be incorporated in costsheet would depend upon the requirement of management for the purpose of control.

8.5 Advantages of Cost Sheet

- (1) It discloses the total cost and the cost per unit of the units produced during the given period.
- (2) It enables a manufacturer to keep as close watch and control over the cost of production.
- (3) By providing a comparative study of the various elements of current cost with the past results and standard costs, it is possible to find out the causes of variations in costs and to eliminate the adverse factors and conditions which increases the total cost.
- (4) It acts as a guide to the manufacturer and helps him in formulating a definite useful production policy.
- (5) It helps in fixing up the selling price more accurately.
- (6) It helps the businessman to minimise the cost of production when there is a cut throat competition.
- (7) It helps the businessman to submit quotations with reasonable degree of accuracy against tenders for the supply of goods.

8.6 Specimen of Cost Sheet

<i>Total Output in Units</i>	<i>Total Cost Rs.</i>	<i>Cost per Unit Rs.</i>
Direct Material		
Direct Labour		
Prime Cost		
Add : Works Overheads		
Works Cost		
Add : Administrative Overheads		
Cost of Production		
Add : Selling and Distribution Overheads		
Total Cost or Cost of Sales		

8.7 Tenders or Quotations

A producer submits a tender or a quotation price for the supply of the commodities he produces or for completing a job. A tender has to be prepared very carefully as the receipts of orders depend upon the acceptance or quotations supplied by the manufactures. The preparation of tenders requires information regarding Prime Cost, Works, Administration and Selling overheads and profit of the preceeding period. The manufacturer has to ascertain and find out the possible changes in prices and costs. He must have a reasonable amount of profit by taking into consideration the maket condition.

8.8 Examples

1. Prepare Cost Statement for the year ended 31 Dec. 2005 from the following information

	<i>Rs.</i>
Direct Materials	40,000
Direct Wages	30,000
Direct Expenses	5,000
Factory Overheads	10,000
Administrative Overheads	7,500
Distribution Overheads	3,000
Profit 20% on total Cost	

Solution :

Cost Sheet of a Company for the year ended 31-12-2004

	<i>Rs.</i>
Direct Materials	40,000
Direct Wages	30,000
Direct Expenses	5,000
Prime Cost	75,000
Factory Overheads	10,000
Factory Cost	85,000
Administrative Overheads	7,500
Production Cost	92,500
Distribution Overheads	3,000
Total Cost	95,500
Profit (20% on 95,500)	19,100
Sales	1,14,600

Example 2:

Direct Materials 1,00,000

Direct Wages 65,000

Works Overheads: 60% of Direct Wages

Office Overheads: 80% of Factory Cost

Selling Overheads : 10% of Factory Cost

Profit 20% on Sales.

Solution :

Cost Sheet	
	<i>Rs.</i>
Direct Materials	1,00,000
Direct Wages	65,000
Prime Cost	1,65,000
Works Overheads ($65,000 \times \frac{60}{100}$)	39,000
Work Cost	2,04,000
Office Overheads ($2,04,000 \times \frac{80}{100}$)	1,63,200
Cost of Production	3,67,200
Selling Overheads ($2,04,000 \times \frac{10}{100}$)	20,400
Cost of Goods sold	3,87,600
Profit $3,87,600 \times \frac{20}{80}$	96,900
Sales	4,84,500

Examples 3:

From the following information prepare cost statement.

	<i>Rs.</i>	<i>Rs.</i>
	1-1-2004	31-12-2004
Balance of Materials	50,000	65,000
Stock of Work-in-progress	15,000	20,000
Stock of Finished goods	64,000	42,000

Transactions during the Year

	<i>Rs.</i>		
Materials Purchased	75,000	Depreciation on Machinery	2,600
Carriage on Purchases	2,000	Advertisement	5,800
Direct Expenses	3,500	Warehouse Rent	1,100

Direct Wages	45,000	Office Expenses	4,700
Factory Expenses	18,500	Salaries	9,900
Indirect Wages	7,600	Rent, Rates	8,300
Carriage on Sales	2,000		
Sales	3,05,000		

Statement of Cost for the year ending 31-12-2004

	Rs.	Rs.
Materials (Opening)	50,000	
Add : Purchase of Materials	75,000	
	<u>1,25,000</u>	
Carriage on Purchase	2,000	
	<u>1,27,000</u>	
Less: Closing Balance of Materials	65,000	
Materials consumed		62,000
Direct Wages		45,000
Direct Expenses		<u>3,500</u>
Prime Cost		1,10,500
Add : Factory Overheads :		
Factory Expenses	18,500	
Indirect Wages	7,600	
Depreciation on Machinery	<u>2,600</u>	28,700
		<u>1,39,200</u>
Add : Opening Stock of Work-in-progress		15,000
		<u>1,54,200</u>
Less : Closing Stock of Work-in-progress		<u>20,000</u>
Factory Cost		1,34,200
Add : Office Overheads		
Salaries	9900	
	4700	
Rent, Rates	<u>8300</u>	22,900
Cost of Production of Goods manufactured		<u>1,57,100</u>
Add : Opening Stock of finished goods		64,000
		<u>2,21,000</u>
Less: Closing Stock of finished goods		<u>42,000</u>
Cost of Production of goods sold		<u>1,79,000</u>
Add : Selling & distribution overheads:		
Advertisement	5800	
	1100	
	<u>2000</u>	8900
Cost of Sales		<u>1,88,000</u>
Add : Profit		<u>1,17,000</u>
Sales		<u>3,05,000</u>

Example 4:

From the following information related to a company for the year 2004, what price should the product be sold. So as to earn same rate of profit on the selling price as in 2004.

	Rs.
Cost of Materials	6,00,000
Wages	5,00,000
Factory Overhead	3,00,000
Administration Charges	3,36,000
Selling Charges	2,24,000
Distribution Charges	1,40,000
Profit	4,20,000

A work order has been executed in 2005 and the following expenses have been incurred.

Materials Rs.8000, Wages Rs.5000.

Assuming that the rate of factory overhead has gone up by 20%, distribution charges have gone down by 10%, selling and Administrative charges have each gone up by 12 1/2%.

Factory overhead is based on Direct Labour and Administration, Selling and Distribution charges on factory cost.

Solution:**Statement of Cost for the year 2004**

Materials	6,00,000	
Wages	<u>5,00,000</u>	
Prime Cost	11,00,000	
Factory Overheads	<u>3,00,000</u>	
Factory Cost	14,00,000	
Administrative Overheads	<u>3,36,000</u>	
Office Cost	17,36,000	
Selling Charges	2,24,000	
Distribution Charges	<u>1,40,000</u>	<u>3,64,000</u>
Total Cost	21,00,000	
Profit (20% on Cost 21,00,000 x 20/100)		<u>4,20,000</u>
Selling Price	<u>25,20,000</u>	

Working Notes :

$$\text{Percentage of Factory overhead on Direct Labour} = \frac{3,00,000}{5,00,000} \times 100 = 60\%$$

$$\text{Percentage of Administration Charges on Factory Cost} = \frac{3,36,000}{14,00,000} \times 100 = 24\%$$

$$\text{Percentage of Selling Charges on Factory Cost} = \frac{2,24,000}{14,00,000} \times 100 = 16\%$$

$$\text{Percentage of distribution charges on Factory Cost} = \frac{1,40,000}{14,00,000} \times 100 = 10\%$$

Statement of Selling Price of the Work Order

	Rs.	Rs.
Materials		8,000
Wages		<u>5,000</u>
Prime Cost		13,000
Add: Factory Overhead		
60% of Wages $\left(5000 \times \frac{60}{100}\right)$	3,000	
Add: 20% increase $\left(3000 \times \frac{20}{100}\right)$	<u>600</u>	<u>3,600</u>
Factory Cost		16,600
Add: Administration Overhead		
24% of Factory Cost $\left(16600 \times \frac{24}{100}\right)$	3,984	
Add: 12 1/2% increase $\left(3984 \times \frac{25}{200}\right)$	<u>498</u>	<u>4,482</u>
Cost of Production	21,082	
Add: Selling Charges		
10% of Factory Cost $\left(16600 \times \frac{10}{100}\right)$	2,656	
12 1/2% increase $\left(2656 \times \frac{25}{200}\right)$	<u>332</u>	2,988
Add: Distribution Charges		

10% of Factory Cost $\left(16600 \times \frac{10}{100}\right)$	1,660	
Less: 10% Decrease $\left(1660 \times \frac{10}{100}\right)$	<u>166</u>	<u>1,494</u>
Total Cost		25,564
Add: Profit 20% on Cost $\left(25564 \times \frac{20}{100}\right)$		<u>5,113</u>
		30,677

Example 5 :

An engineering company limited manufactured and sold 1000 radio sets in 2004. The following are particulars regarding the radios sold and manufactured by them.

Cost of Materials	80,000
Wages	1,20,000
Manufacturing Expenses	50,000
Salaries	60,000
Rent and Rates	10,000
Selling Expenses	30,000
General Expenses	20,000
Sales	4,00,000

The company desires to supply 200 radio sets to a commercial concern. You are required to prepare a statement showing the price at which Radios should be sold so as to show a profit of 10% on selling price. The following additional information is supplied to you.

1. The price of materials will rise by 20% on previous year level.
2. Wage will rise up by 5%.
3. Manufacturing expenses will rise up by 10%.
4. Office and selling expenses per unit remain the same.

Solution:

Cost Statement for the year ended 2004 [output of 1000 radio sets]

	Total Cost	Cost per Unit
	Rs.	Rs.
Materials	80,000	80
Wages	<u>1,20,000</u>	<u>120</u>
Prime Cost	2,00,000	200
Factory Overheads :		
Manufacturing Expenses	<u>50,000</u>	<u>50</u>
Factory Cost	2,50,000	250
Office Overheads :		
Salaries	60,000	60
Rent and Rates	10,000	10
General Expenses	<u>20,000</u>	<u>20</u>
Cost of Production	3,40,000	340
Selling Expenses	<u>30,000</u>	<u>30</u>
Total Cost	3,70,000	370
Profit	<u>30,000</u>	<u>30</u>
Sales	4,00,000	400

Statement Showing the Estimated Price (200 Radios)

		Cost per Unit	Total Cost
		Rs.	Rs.
Material	80		
Add : Price rise by 20% (80 x 20/100)	<u>16</u>	96	19,200
Wages	120		
Add: Rise by 5%(120 x 5/100)	<u>6</u>	<u>126</u>	<u>25,200</u>
Prime Cost		222	44,400
Add: Factory Overheads:			
Manufacturing Expenses	50		
Add: Rise by 10% (50x10/100)	<u>5</u>	<u>55</u>	<u>11,000</u>
Factory Cost		277	55,400
Add: Office Overheads			
Salaries		60	12,000
Rent & Rates		10	2,000
General Expenses		<u>20</u>	<u>4,000</u>
Cost of Production		367	73,400
Add: Selling Expenses		<u>30</u>	<u>6,000</u>
Total Cost		397	79,400

Add: Profit 11 $\frac{1}{9}$ % or $\frac{1}{9}$ on Cost Price	$\frac{44-11}{441-11}$	$\frac{8,822}{88,222}$
Selling Price	441-11	88,222

Working Note :

Profit 10% on Selling Price

If sale price is Rs.100 - Profit is Rs.10

If Cost price is Rs.90 - Profit is Rs.10

Cost price is Rs.100 - $\frac{10}{90} \times 100 = 11\frac{1}{9}\%$ on Cost Price or $\frac{1}{9}$

Example 6:

From the following information prepare a production Account showing the components of cost of production.

Stock of finished goods 31-12-2005	73,000
Stock of Raw materials 31-12-2005	35,000
Purchase of Raw materials	7,60,000
Productive Wages	5,20,000
Stock of finished goods 1-12-2006	82,500
Stock of Raw materials 31-12-2006	37,500
Sale of finished Goods	15,45,800
Works overhead charges	1,30,200
Office and general charges	69,700

Production Account for the year ending 31-12-2006

Particulars	Rs.	Particulars	Rs.
To Opening Stock of Raw materials	35,000	By Closing stock of Raw Materials	37,500
To Purchases	<u>7,60,000</u>	By Material Consumed	<u>7,57,500</u>
	<u>7,95,000</u>		<u>7,95,000</u>
To Material Consumed	7,57,500	By Prime Cost	12,77,500
To Wages	<u>5,20,000</u>		<u>12,77,500</u>
	<u>12,77,500</u>	By Factory Cost	<u>14,07,700</u>
To Prime Cost	12,77,500		<u>14,07,700</u>
To Works overhead	<u>1,30,200</u>	By Cost of Production	<u>14,77,400</u>
	<u>14,07,700</u>		<u>14,77,400</u>
To Factory Cost	14,07,700		
To Office Overheads	<u>69,700</u>		
	<u>14,77,400</u>		
To Cost of Production	14,77,400	By Closing Stock of finished goods	82,500
To Opening Stock of finished goods	<u>73,000</u>	By Cost of Sales	<u>14,67,900</u>
	<u>15,50,400</u>		<u>15,50,400</u>

To Cost of Sales	14,67,900	By Sales	15,45,800
To Profit	<u>77,900</u>		
	<u>15,45,800</u>		<u>15,45,800</u>

8.9 Exercise

1. Prepare Cost Sheet for the following data.

	<i>01.01.2004</i> Rs.	<i>31-12-2004</i> Rs.
Raw materials	60,000	50,000
Work-in-progress	24,000	30,000
Finished Goods	1,20,000	1,10,000
Materials purchased	9,00,000	
Wages	5,00,000	
Factory Overheads	2,00,000	
Administrative Overheads	50,000	
Selling Expenses	30,000	
Sales	20,00,000	

Ans: Profit Rs.3,06,000

2. A factory uses job costing. Following data is obtained from its books for the year ended. 31 Dec., 2004

	Rs.		Rs.
Direct Materials	90,000	Direct Wages	75,000
Profit	60,900	Selling Overheads	52,500
Administrative Overheads	42,000	Factory Overheads	45,000

In 2005, the factory receives an order for a number of jobs. It is estimated that the direct materials required will be Rs.1,20,000 and direct labour will cost Rs.75,000. What should be the price for these jobs if the factory intends to earn the same rate of profit on sales assuming that the selling and distribution overheads has gone up by 15%. Factory overhead is recovered on direct wages and all other overhead on factory cost.

Ans. Estimated Selling Price Rs.4,28,400.

3. On 30th April 2004, a manufacturer was required to quote for a contract to supply 1000 electric

stoves. From the following data prepare a statement showing the price to be quoted to give the same percentage of net profit on turnover as was realised during the six months to 31 March 2004.

	Rs.
Stock of Materials 1-10-2003	35,000
Stock of Materials 31-3-2004	4,900
Purchase of materials, six months to 31-3-2004	52,500
Factory Wages	95,000
Establishment Expenses	10,000
Completed Stock on hand 1-10-2003	Nil
Completed Stock 31-3-2004	35,000
Sales	1,89,000

The number of stoves manufactured during six months was 4000 including those sold and those on stock at the close of the period. The stoves to be quoted are of uniform quality and make and similar to those manufactured during six months. From April 1, 2004 cost of materials gone up by 15% and wages by 10%.

Ans: Quotation price for 1000 stoves Rs.63,053.

4. The directors of manufacturing company require an account showing the production results of a business for the month of April, 2005. The cost accounts give the following information.

	Rs.
Stock of Materials (1-4-2005)	25,000
Stock of finished goods (1-4-2005)	17,360
Stock of Materials (30-4-2005)	26,250
Finished goods - 30% of goods produced.	
Purchased of Materials	21,900
Work-in-progress(1-4-2005)	8,220
Work in progress(30-4-2005)	9,100
Sales	72,310
Direct Wages	17,150
Works Expenses	8,340
Office Expenses	6,670
Selling and Distribution Expenses	4,210

Sale of Scrap

330

Ans. : Profit Rs. 14,620/-

8.10 Summary

Unit Costing is applied in industries manufacturing products or rendering service such as collieries, brick making, flour mills, cement, paper, iron and steel, sugar breweries etc.

This method of costing is applied to ascertain the total and per unit cost.

8.11 Terminology

Materials : Cost of material charged directly to the production.

Labour : Direct labour costs forms apart of prime cost where as indirect labour cost is charged to the factory overheads.

Overheads : Indirect expenses are known as overheads. They are usually charged at a predetermined rate.

Statement of Cost : It gives total cost and cost per unit.

8.12 Self Assessment Questions

Five Marks Questions

1. Cost Statement.
2. Production Account.
3. Unit Costing.
4. Tender Price.

Ten Marks Questions

1. What is meant by Unit Costing? Explain its features?
2. What is Cost Sheet? Explain its advantages.

Twenty marks Questions

1. Show the sepcimen Cost Sheet and explain the items of Cost Sheet.

8.13 Reference Books

Cost Accounting	M.N.Arrora
Cost Accounting	Jain & Narang
Cost Accounting	Lal Nigam

- Ch. Neela Krishnaveni