MANAGEMENT ACCOUNTING

M.COM – I SEMESTER

Paper Code : MCOM 1911

PONDICHERRY UNIVERSITY

(A Central University)

CENTRE FOR DISTANCE & ONLINE EDUCATION

R.V. Nagar, Kalapet, Puducherry – 605 014

Advisory Committee

1. **Prof. P. Prakash Babu**
   Vice-Chancellor,
   Pondicherry University.

2. **Prof. D. Lazar**
   Director,
   Centre for Distance &
   Online Education,
   Pondicherry University.

Review Committee

1. **Prof. D. Lazar**
   Director, CDOE,
   Pondicherry University.

2. **Prof. S. Shijin**
   Professor,
   Programme Coordinator,
   Department of Commerce,
   Pondicherry University.

Academic Support Committee

1. **Dr. A. Punitha**
   Asst. Professor, CDOE,
   Pondicherry University.

2. **Dr. V. Umasri**
   Asst. Professor, CDOE,
   Pondicherry University.

3. **Dr. Sk. Md. Nizamuddin Asst.**
   Professor, CDOE,
   Pondicherry University.

Administrative Support Committee

1. **Dr. Arvind Gupta**
   Asst. Director, CDOE,
   Pondicherry University.

Course Writer

Prof. P.Natarajan,
Dean, School of Management,
Dept.of Commerce,
Pondicherry University.

Dr. V. Umasri
Assistant Professor
CDOE, PU
Pondicherry University.

Copyright

This book may not be duplicated in any way without the written consent of the Pondicherry University except in the form of brief excerpts or quotations forthe purpose of review.

The information contained herein is for the personal use of the DDE students, Pondicherry University and may not be incorporated in any commercial programs, other books, databases or any kind of software without the written consent of the author. Making copies of this book or any portion, for any purpose other than your own is a violation of copyright laws. The author has used their best efforts in preparing this book and believes that the content is reliable and correct to the best of their knowledge.

M.COM – I Semester **Paper Code: MCOM 1911**

MANAGEMENT ACCOUNTING

Objectives

- To apply various management accounting techniques to all types of organizations for planning, decision making and control purposes in practical situations and
- To familiarize Contemporary Issues in Management Accounting

Unit I

Nature and scope of Management and Cost Accounting: Objective - Nature, Management Accounting and Managerial Decisions - Management Accounts Position, Role and Responsibilities. Responsibility Centre - Cost Centre, Profit Centre and Investment Centre; Objective and Determinants of Responsibility Centre – Cost sheet Preparation.

Unit II

Budgeting and Budgetary control: Sales Budget – Cash Budget – Operating Budget – Master Budget – Flexible Budgeting – Zero Base Budgeting – Performance Budgeting.

Marginal Costing: Concept - Cost Volume Profit Analysis - Break-Even Analysis; Decision making – Make or Buy, Own or Lease, Repair or Renovate, Sell or Scrap, Export Decision, Shut Down or Continue and Sales-Mix.

Unit III

Standard Costing and Variance Analysis: Material Cost Variance - Labour Cost Variance - Overhead Variance – Sales Variance - Profit Variance.

Unit IV

Financial Statement Analysis: Vertical, Horizontal and Trend Analysis - Ratio Analysis – Types of Ratios - Uses and Limitations – problems in Balance Sheet to Ratios and Ratios to Balance Sheet – DuPont Analysis. Cash Flow Statement Analysis - Current Trends in the preparation of Cash Flow Statement.

Unit V

Contemporary Issues in Managerial Decisions Accounting: Value Chain Analysis, Activity Based Costing (ABC), Transfer Pricing, Total Quality Management (TQM), Target and Life Cycle Costing, Just in Time (JIT), Backflush Costing, Six Sigma, Balanced Scorecard and Throughput Accounting (TA).

Note: Question Paper Shall covers 20% Theory and 80% Problems

References:

1. Arora M. N., *"Cost and Management Accounting*, Vikas Publishing House (P) Ltd
2. Jain and Narang, *Cost and Management Accounting*, Ludhiana, Kalyani Publishers.
3. Sikdar P.K., *"Advanced Cost and Management Accounting"*, Oscar Publications.
4. Maheswari S.N., *Principles of Management Accounting*
5. Nigam L.and Sharma G.L, *Cost Accounting*

TABLE OF CONTENTS

UNIT	LESSON	TITLE	PAGE NO.
I	1	Introduction To Managerial Decision Accounting	4
II	1	Budget, Budgeting And Budgetary Control	18
	2	Marginal Costing	52
III	1	Standard Costing And Variance Analysis	96
IV	1	Financial Statement Anaysis	127
	2	Fund Flow And Cash Flow Anaysis	167
V	1	Contemporary Issues – Emerging Costing Techniques	195
	2	Emerging Organizational Performance Metrics	215

UNIT -1

INTRODUCTION TO MANAGERIAL DECISION ACCOUNTING

Learning Objectives: After studying this lesson you are able to understand:

- Importance of Accounting for Managerial Decisions
- Meaning, Nature and Scope of Management Accounting
- Tools and Techniques of Management Accounting
- Functions and Responsibilities of Management Accountant
- Uses and limitations of Management Accounting

Contents:

- Introduction
- Meaning of accounting
- Branches of accounting
- Need for accounting for managerial decisions
- Meaning and definitions of management accounting
- Objectives of management accounting
- Nature and scope of management accounting
- Tools and Techniques widely used in Management Accounting
- Limitations of management accounting
- Role of management accountants
- Responsibility accounting
- Cost Centres,
- Profit Centres
- Investment Centres
- Conclusion

INTRODUCTION

A business enterprise must keep a systematic record of what happens from day-to-day transactions and events so that it can know its position clearly. Most of the business enterprises are run in the form of corporate entities. These business houses are required by law to prepare periodical statements in prescribed format showing the state of financial affairs. The systematic record of the daily events of a business leading to presentation of a complete financial position is known as accounting. Thus, Accounting is the language of business. A business enterprise speaks through accounting. It reveals the position, especially the financial position through the language called accounting. The different parties who are interested in knowing about the business could understand it very and act accordingly with the business units

MEANING OF ACCOUNTING

Accounting is the process of recording, classifying, summarizing, analyzing and interpreting the financial transactions of the business for the benefit of management and those parties who are interested in business such as shareholders, creditors, bankers, customers, employees and government. Thus, it is concerned with financial reporting and decision making aspects of the business.

The American Institute of Certified Public Accountants Committee on Terminology proposed in 1941 that accounting may be defined as, "The art of recording, classifying and summarizing in a significant manner and in terms of money, transactions and events which are, in part at least, of a financial character and interpreting the results thereof".

BRANCHES OF ACCOUNTING

Accounting can be classified into three categories:

1. Financial Accounting - Mandatory for all types of business units
2. Cost Accounting, and - special branch of accounting to be adopted by the corporate
3. Management Accounting - special branch of accounting practiced by the corporate for financial analysis and decision-making purposes. Hence it is called decision accounting.

Need for Accounting for Managerial Decisions

Decision making is the process of choosing from the alternative course of action the best one for doing a work. Decision –making permeates through all the facts of managerial function, planning and organization as well as coordination and control.

Decision Accounting is a process involving an integrated application of various accounting tools like marginal costing, break-even analysis, CVP analysis etc. In the development of the analysis for alternate choice decisions, relevant costs are compared as a means of measuring the total difference in costs between alternatives. The increasing complexity of organizational problems requires that improved methods of decision-making must be utilized. Technological developments and data processing by computers have left traditional accounting far behind in its ability to serve the decisional needs of management. Thus decision accounting is very much essential in the present day context of wide uncertainties and risky situations.

- Accounting information is useful in control as a means of communication, of motivation and of appraisal. Accounting reports can assist in informing the organization about management plans and policies and in general, the types of action that management wishes the organization to take.
- Management accounting is a powerful tool of forecasting, planning and regulating business activity as whole. It is the presentation of accounting information in such a way as to assist management in the creation of policy and the day-to-day operation of an undertaking.

Meaning and Definitions of Management Accounting

It refers to accounting for the management. It provides necessary information to assist the management in the creation of policy and in the day to day operations. It enables the management to discharge all its functions, namely, planning, organizing, staffing, direction and control efficiently with the help of accounting information.

Management accounting is not a specific system of accounting. It could be any form of accounting which enables a business to be conducted more effectively and efficiently. It is largely concerned with providing economic information to mangers for achieving organizational goals. Though

much of the management accounting information are financial in nature but are organized in a manner relating directly to the decision on hand.

Management Accounting is comprised of two words ‘Management’ and ‘Accounting’. It means the study of managerial aspects of accounting. The emphasis of management accounting is to redesign accounting in such a way that it is helpful to the management in formation of policy, control of execution and appreciation of effectiveness.

Management accounting is of recent origin. This was first used in 1950 by a team of accountants visiting U. S. A under the auspices of Anglo-American Council on Productivity

Anglo-American Council on Productivity defines Management Accounting as, “the presentation of accounting information in such a way as to assist management to the creation of policy and the day to day operation of an undertaking”

The American Accounting Association defines Management Accounting as “the methods and concepts necessary for effective planning for choosing among alternative business actions and for control through the evaluation and interpretation of performances”.

The Institute of Chartered Accountants of India defines Management Accounting as follows: “Such of its techniques and procedures by which accounting mainly seeks to aid the management collectively has come to be known as management accounting”

From these definitions, it is very clear that financial data are recorded, analyzed and presented to the management in such a way that it becomes useful and helpful in planning and running business operations more systematically.

Objectives of management accounting

The fundamental objective of management accounting is to enable the management to maximize profits or minimize losses. The main objectives of management accounting are as follows:

1. **Planning and policy formulation**:

Planning involves forecasting on the basis of available information, setting goals; framing polices determining the alternative courses of action and deciding on the programme of

activities. It facilitates the preparation of statements in the light of past results and gives estimation for the future.

2. Interpretation process:

Management accounting is to present financial information to the management. Financial information is technical in nature. Therefore, it must be presented in such a way that it is easily understood. It presents accounting information with the help of statistical devices like charts, diagrams, graphs, etc.

3. Assists in Decision-making process:

With the help of various modern techniques management accounting makes decision-making process more scientific. Data relating to cost, price, profit and savings for each of the available alternatives are collected and analyzed and thus it provides a base for taking sound decisions.

4. Controlling:

Management accounting is a useful tool for managerial control. Management accounting tools like standard costing and budgetary control are helpful in controlling performance. Cost control is affected through the use of standard costing and departmental control is made possible through the use of budgets. Performance of each and every individual operation is controlled with the help of management accounting.

5. Reporting:

Management accounting keeps the management fully informed about the latest position of the concern through reporting. It helps management to take proper and quick decisions. The performances of various departments are regularly reported to the top management.

6. Facilitates Organizing:

Since management accounting stresses more on Responsibility Centers with a view to control costs and responsibilities, it also facilitates decentralization to a greater extent. Thus, it is helpful in setting up effective and efficient organization framework.

7. Facilitates Coordination of Operations:

Management accounting provides tools for overall control and coordination of business operations. Budgets are important means of coordination.

NATURE AND SCOPE OF MANAGEMENT ACCOUNTING

Management accounting involves furnishing of accounting data to the management for making and substantiating its decisions. It helps in improving efficiency and achieving the organizational goals. The nature of work in management accounting is:

1. Provides accounting information:

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

2. Cause and effect analysis.

The role of financial accounting is limited to find out the ultimate result, i.e., profit and loss, where as management accounting goes a step further. Management accounting discusses the cause and effect relationship. The reasons for the loss are probed and the factors directly influencing the profitability are also analyzed. Profits are compared to sales, different expenditures, current assets, interest payables, share capital, etc. to give meaningful interpretation.

3. Use of special techniques and concepts.

Management accounting uses special techniques and concepts according to necessity, to make accounting data more useful. The techniques usually used include financial planning and analysis, standard costing, budgetary control, marginal costing, project appraisal etc.

4. Taking important decisions.

It supplies necessary information to the management which may be useful for its decisions. The historical data is studied to see its possible impact on future decisions. The implications of various decisions are also taken into account.

5. Achieving of objectives.

Management accounting uses the accounting information in such a way that it helps in formatting plans and setting up objectives. Comparing actual performance with targeted figures will give an idea to the management about the performance of various departments. When there are deviations, corrective measures can be taken at once with the help of budgetary control and standard costing.

6. No fixed norms.

No specific rules are followed in management accounting as that of financial accounting. Though the tools are the same, their use differs from concern to concern. The deriving of conclusions also depends upon the intelligence of the management accountant.

7. Increase in efficiency.

The purpose of using accounting information is to increase efficiency of the concern. The performance appraisal will enable the management to pin-point efficient and inefficient spots. Effort is made to take corrective measures so that efficiency is improved. The constant review will make the staff cost – conscious.

8. Supplies information and not decision.

Management accountant is only to guide to take decisions. The data is to be used by the management for taking various decisions. 'How is the data to be utilized' will depend upon the caliber and efficiency of the management.

9. Concerned with forecasting.

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

Tools and Techniques widely used in Management Accounting.

As we know management accounting is mainly concerned with accounting information which is useful to management. It helps the management in solving the operational problems of the concern. It aims at presenting the accounting information to help the management in formulation of policies and increasing the operational efficiency so as to maximize profits or minimizes losses of the undertaking.

1. Financial Planning: It is an elaborate programme to be chalked out in advance with regard to various financial activities of the organization in line with its goals. They are: Determination of long-term and short term financial objectives of the firm. Formulation of financial policies, Development of financial procedures to achieve the objectives. Amount of capital required for the firm, the policies determining the sources of funds, proportion

of sources in terms of equity and debt, determination of income, deciding about the optimum level investment in current and fixed assets etc.

2. Financial Analysis: Analysis and interpretation of financial statements is an important tool of Management accounting. It can be done by applying various tools viz., Comparative financial statement analysis, Common Size Statement analysis, Fundflow analysis and Ratio Analysis.
3. Budgetary Control: It is technique of directing business operations in a desired direction.
4. Standard Costing: It is designed to give costs of operation or process rather than products so that variances may be traced to the source and take action accordingly to proceed further.
5. Marginal Costing: It is an important tool in the hands of management to take sound scientific decisions regarding production and distribution. It helps to optimize the utilization of fixed cost which in turn helps to know where the firm is? And how it is in terms of its financial position.
6. Fund Flow Statement Analysis: It gives an insight into the more detailed analysis and understanding of changes in the distribution of resources between two B/S dates
7. Revaluation Accounting: It involves more extended estimation and prediction of things to come requiring a high order of intellectual ability for their economic analysis.
8. Statistical and Graphical Techniques: Investment chart, current asset chart, Master chart, Chart of sales and statistical techniques like Method of Least Squares, Regression analysis, Linear Programming and SQC are widely used for this purpose.
9. Financial Reporting and Communication: Provide at all levels with the necessary factual data information to enable them to carry out the various functions efficiently.

Limitations of management accounting

A few shortcomings of Management Accounting are:

1. Limitations of Accounting Records:

Management accounting derives its information from financial accounting, cost accounting and other records. It is concerned with the rearrangement or modification of data. The correctness or otherwise of the management accounting depends upon the correctness of these basic records. The limitations of these records are also the limitations of management accounting.

2. It is only a Tool not decision itself.

Management accounting is not an alternate or substitute for management. It is a mere tool for management. Ultimate decisions are being taken by management and not by management accounting.

3. Heavy Cost of Installation:

The installation of management accounting system needs a very elaborate organization. This results in heavy investment which can be afforded only by big concerns.

4. Personal Bias:

The interpretation of financial information depends upon the capacity of interpreter as one has to make a personal judgment. Personal prejudices and bias affect the objectivity of decisions.

5. Psychological Resistance:

The installation of management accounting involves basic change in organization set up. New rules and regulations are also required to be framed which affect a number of personnel and hence there is a possibility of resistance form some or the other.

6. Evolutionary stage:

Management accounting is only in a developmental stage. Its concepts and conventions are not as exact and established as that of other branches of accounting. Therefore, its results depend to a very great extent upon the intelligent interpretation of the data of managerial use.

7. Provides only Data not result or solution as such

Management accounting provides data and not decisions. It only informs, not prescribes. This limitation should also be kept in mind while using the techniques of management accounting.

8. Broad-based Scope:

The scope of management accounting is wide and this creates many difficulties in the implementations process. Management requires information from both accounting as well as non-accounting sources. It leads to inexactness and subjectivity in the conclusion obtained through it.

Role of Management Accountants

The designation of the person who is entrusted with the management accounting functions in an organization vary from company to company They are called as Chief Account officer, Finance director Controller of Accounts , Finance Controller etc

Accounting information defines the objectives and goals of business in terms of physical performance as well as profits of the organization. The controller being a skilled business analyst is best qualified to keep the financial records of the business and to interpret these for the guidance of the management.

- Define the objectives of the business in physical performance
- Determines the responsibility centres
- Plan adequately to control the operations includes profit planning, programmes for capital investing and financing, sales forecast, expense budgets and Formulate the control standards.
- Determine the controllable costs
- Analyse the accounting information from the accounting records periodically.
- Evaluate the actual performance
- Analyse the causes of variance by comparing actual performance with standards laid down
- Suggests for correction of deviations
- Review the whole control system and incorporate modifications whenever warranted.
- Advise the management on course of action to be taken in a given set of circumstances with the object of eliminating intuition in business affairs.
- Assure fiscal protection to the assets of the business through adequate internal control and auditing and assuring insurance coverage.
- Make a thorough study of all the external influences that may exert their effect on the business and interpret them and report to the top management.
- Supervise all matters relating to tax accounting, preparation of return and submission of return on time.

Conventions of Management Accounting

- The principles of matching costs with revenues should be strictly adhered to.

- Profits are to be credited on realization which losses are to be provided in advance
- Costs and revenues should be properly matched.
- The accounting records should be maintained as objective as possible.
- Reporting and presenting information to the management, the principle of reporting exception should be followed.
- Reports and statements should not be deemed substitute for personal contacts with the persons at the higher levels of authority.
- Management accounting should be forward looking and should lay stress on the anticipation of problems in the fast changing business world of technology and science. These conventions are not exhaustive and final .

Responsibility Accounting

"Responsibility Accounting collects and reports planned and actual accounting information about the inputs and outputs of responsibility centers".

It is based on information pertaining to inputs and outputs. The resources utilized in an organization are physical in nature like quantities of materials consumed, hours of labour, etc., which are called inputs. They are converted into a common denominator and expressed in monetary terms called "costs", for the purpose of managerial control. In a similar way, outputs are based on cost and revenue data. Responsibility Accounting must be designed to suit the existing structure of the organization. Responsibility should be coupled with authority. An organization structure with clear assignment of authorities and responsibilities should exist for the successful functioning of the responsibility accounting system. The performance of each manager is evaluated in terms of such factors.

RESPONSIBILITY CENTRES

The main focus of responsibility accounting lies on the responsibility centres. A responsibility centre is a sub unit of an organization under the control of a manager who is held responsible for the activities of that centre. The responsibility centres are classified as follows:-

1) Cost Centres,

2) Profit Centres and

3) Investment centres.

Cost Centres

When the manager is held accountable only for costs incurred in a responsibility centre, it is called a cost centre. It is the inputs and not outputs that are measured in terms of money. A cost centre records only costs incurred by the centre/unit/division, but the revenues earned (output) are excluded from its purview. It means that a cost centre is a segment whose performance is measured in terms of cost without taking into consideration its attainments in terms of "output". The costs are the data for planning and control of cost canters. The performance of the managers is evaluated by comparing the costs incurred with the budgeted costs. The management focuses on the cost variances for ensuring proper control.

A cost centre does not serve the purpose of measuring the performance of the responsibility centre, since it ignores the output (revenues) measured in terms of money. For example, common feature of production department is that there are usually multiple product units. There must be some common basis to aggregate the dissimilar products to arrive at the overall output of the responsibility centre. If this is not done, the efficiency and effectiveness of the responsibility centre cannot be measure.

Profit Centres

When the manager is held responsible for both Costs (inputs) and Revenues (output) it is called a profit centre. In a profit centre, both inputs and outputs are measured in terms of money. The difference between revenues and costs represents profit. The term "revenue" is used in a different sense altogether. According to generally accepted principles of accounting, revenues are recognized only when sales are made to external customers. For evaluating the performance of a profit centre, the revenue represents a monetary measure of output arising from a profit centre during a given period, irrespective of whether the revenue is realized or not.

The relevant profit to facilitate the evaluation of performance of a profit centre is the pre–tax profit. The profit of all the departments so calculated will not necessarily be equivalent to the profit of the entire organization. The variance will arise because costs which are not attributable to any

single department are excluded from the computation of the department's profits and the same are adjusted while determining the profits of the whole organization.

Profit provides more effective appraisal of the manager's performance. The manager of the profit centre is highly motivated in his decision-making relating to inputs and outputs so that profits can be maximized. The profit centre approach cannot be uniformly applied to all responsibility centres. The following are the criteria to be considered for making a responsibility centre into a profit centre.

A profit centre must maintain additional record keeping to measure inputs and outputs in monetary terms. When a responsibility centre renders only services to other departments, e.g., internal audit, it cannot be made a profit centre.

A profit centre will gain more meaning and significance only when the divisional managers of responsibility centers have empowered adequately in their decision making relating to quality and quantity of outputs and also their relation to costs. If the output of a division is fairly homogeneous (e.g., cement), a profit centre will not prove to be more beneficial than a cost centre.

Due to intense competition prevailing among different profit centers, there will be continuous friction among the centers arresting the growth and expansion of the whole organization. A profit centre will generate too much of interest in the short-run profit which may be detrimental to the long-term results.

Investment Centers

When the manager is held responsible for costs and revenues as well as for the investment in assets, it is called an Investment Centre. In an investment centre, the performance is measured not by profits alone, but is involved with investments effected. The manager of an investment centre is always interested to earn a satisfactory return. The return on investment is usually referred to as ROI that serves as a criterion for the performance evaluation of the manager of an investment centre. Investment centers may be considered as separate entities where the manager is entrusted with the overall responsibility of inputs, outputs and investment.

Conclusion

Management Accounting is a new language of finance, economics and technology. It helps managers to focus attention towards future operational and accounting data taking into consideration past performance. It encourages managers to quantify their hopes and ambitions of the future on a realistic basis and to use them later as standards of measurement of actual performance. Management Accountants services are inevitable to management in all their functions. They are said to be the eyes and ears of management. To install an efficient and effective management accounting system, an appropriate organization manua should be prepared and adopted. It defines the duty and scope of authority of each executive in the organization. Appropriate forms returns etc, should designed, prepared and made available. Thus, management accounting can be called as decision accounting since it presents information to assist management in the creation of policy and in day to day operations of an undertaking.

Self Assessment Questions

1. Define the term accounting. Explain the uses of accounting information in managerial decision-making.
2. What is Management Accounting? Explain the nature and scope of Management Accounting
3. State the limitations of management accountin?
4. Distinguish between Financial Accounting and Management Accounting
5. Describe the tools and techniques used in management accounting.
6. Describe the role of management accountant in a corporate body.
7. State the limitations of Management Accounting.
8. What is Responsibility Accounting. State is significance
9. Briefly explain the concepts of cost centre, profit centre and Investment Centre.
10. "Management Accounting begins where Financial Accounting ends" With reference to this statement, explain the functions of Management Accounting and Financial Accounting.
11. Management accountancy is the general term employed to describe the financial policy, philosophy and strategy and the appropriate application of suitable financial planning and control accounting system – Eucidate.

Cost Accounting

Meaning:

Cost Accounting is the process of recording, classifying, analyzing, and controlling costs incurred in producing goods or services. It helps management determine the cost of production, fix selling prices, control costs, and improve profitability.

Objectives of Cost Accounting

- Determine the cost of products and services.
- Control and reduce costs.
- Assist in pricing decisions.
- Measure efficiency and profitability.
- Support planning and decision-making.

Elements of Cost

The **elements of cost** are the basic components that make up the total cost of a product or service.

1. Material Cost

Materials used in manufacturing a product.

(a) Direct Material

Materials that become part of the finished product and can be directly identified.

Examples:

- Steel in car manufacturing
- Wood in furniture
- Cloth in garment manufacturing

(b) Indirect Material

Materials used in production but cannot be directly traced to a specific product.

Examples:

- Lubricants
- Cleaning materials

Notes

- Small tools
- Cotton waste

2. Labour Cost

Payment made to employees for their work.

(a) Direct Labour

Workers directly involved in manufacturing the product.

Examples:

- Machine operators
- Carpenters
- Tailors

(b) Indirect Labour

Employees who support production but do not directly manufacture the product.

Examples:

- Factory supervisors
- Security guards
- Maintenance staff
- Storekeepers

3. Expenses

Costs other than materials and labour.

(a) Direct Expenses

Expenses directly attributable to a specific product.

Examples:

- Royalty on production
- Hire charges for special equipment
- Design charges

(b) Indirect Expenses

Expenses incurred for the overall operation of the business.

Examples:

- Factory rent
- Electricity
- Insurance
- Office expenses

Classification of Overheads

Indirect costs are called **overheads** and are classified as:

1. Factory (Production) Overheads

Expenses incurred in the factory during production.

Examples:

- Factory rent
- Factory lighting
- Machine depreciation
- Factory supervisor salary

2. Office and Administration Overheads

Expenses incurred for managing and administering the business.

Examples:

- Office salary
- Office rent
- Printing and stationery
- Audit fees

3. Selling and Distribution Overheads

Expenses incurred to sell and deliver products.

Examples:

- Advertisement
- Sales commission
- Delivery charges
- Packing expenses

Types of Costs

1. Fixed Cost

Costs that remain constant regardless of the level of production.

Examples:

- Factory rent
- Insurance
- Salaries of permanent staff

Characteristics:

- Do not change with output.
- Cost per unit decreases as production increases.

2. Variable Cost

Costs that vary directly with the level of production.

Examples:

- Direct materials
- Direct labour (if paid per unit)
- Power consumed in production

Characteristics:

- Increase or decrease with production.
- Variable cost per unit generally remains constant.

3. Semi-Variable (Mixed) Cost

Costs containing both fixed and variable components.

Examples:

- Telephone bills (fixed monthly charge + usage)
- Electricity bills (minimum charge + consumption)
- Machine maintenance contracts

4. Direct Cost

Costs directly attributable to a product or job.

Examples:

- Direct materials
- Direct labour
- Direct expenses

5. Indirect Cost

Costs that cannot be directly traced to a specific product.

Examples:

- Factory rent
- Supervisor's salary
- Office expenses

6. Product Cost

Costs incurred to manufacture a product.

Includes:

- Direct materials
- Direct labour
- Manufacturing overheads

7. Period Cost

Costs charged to the accounting period in which they are incurred.

Examples:

- Selling expenses
- Administrative expenses
- Office salaries

8. Opportunity Cost

The benefit sacrificed by choosing one alternative over another.

Example:

A company uses its own building for production instead of renting it out. The rental income forgone is the opportunity cost.

9. Sunk Cost

A cost that has already been incurred and cannot be recovered.

Notes

Example:

Money spent on market research for a discontinued product.

10. Marginal Cost

The additional cost of producing one extra unit.

Formula: Marginal Cost = $\frac{\text{Change in Output}}{\text{Change in Total Cost}}$

Cost Sheet

A **cost sheet** is a statement that shows the total cost of manufacturing a product by classifying costs into materials, labour, overheads, and other expenses. It helps determine the **cost per unit**, **selling price**, and **profitability**.

Standard Cost Sheet Format

Particulars	**Amount (₹)**
Direct Materials Consumed	XXX
Add: Direct Labour	XXX
Add: Direct Expenses	XXX
Prime Cost	XXX
Add: Factory (Works) Overheads	XXX
Add: Opening Work-in-Progress	XXX
Less: Closing Work-in-Progress	(XXX)
Works (Factory) Cost	XXX
Add: Office & Administration Overheads	XXX
Cost of Production	XXX
Add: Opening Finished Goods	XXX
Less: Closing Finished Goods	(XXX)
Cost of Goods Sold	XXX
Add: Selling & Distribution Overheads	XXX

Particulars	Amount (₹)
Cost of Sales (Total Cost)	XXX
Add: Profit	XXX
Sales Value	XXX

Steps to Prepare a Cost Sheet

1. Calculate **Direct Materials Consumed**:
   - Opening Raw Material + Purchases – Closing Raw Material.
2. Add **Direct Labour** and **Direct Expenses** to obtain **Prime Cost**.
3. Add **Factory Overheads** and adjust Work-in-Progress to obtain **Works Cost**.
4. Add **Office & Administration Overheads** to obtain **Cost of Production**.
5. Adjust opening and closing finished goods to obtain **Cost of Goods Sold**.
6. Add **Selling & Distribution Overheads** to obtain **Cost of Sales**.
7. Add the desired **Profit** to determine the **Selling Price**.

Important Formulae

- **Prime Cost** = Direct Material + Direct Labour + Direct Expenses
- **Works Cost** = Prime Cost + Factory Overheads ± Work-in-Progress
- **Cost of Production** = Works Cost + Administration Overheads
- **Cost of Goods Sold** = Cost of Production + Opening Finished Goods – Closing Finished Goods
- **Cost of Sales** = Cost of Goods Sold + Selling & Distribution Overheads
- **Selling Price** = Cost of Sales + Profit

Example

A company provides the following information for June:

Particulars	Amount (₹)
Opening Raw Materials	20,000
Purchases of Raw Materials	1,80,000
Closing Raw Materials	30,000
Direct Labour	1,20,000

Notes

Particulars	Amount (₹)
Direct Expenses	10,000
Factory Overheads	60,000
Opening Work-in-Progress	15,000
Closing Work-in-Progress	10,000
Office & Administration Overheads	40,000
Opening Finished Goods	25,000
Closing Finished Goods	20,000
Selling & Distribution Overheads	30,000
Profit	75,000

Solution

Cost Sheet

Particulars	Amount (₹)
Direct Materials Consumed	1,70,000
Direct Labour	1,20,000
Direct Expenses	10,000
Prime Cost	**3,00,000**
Add: Factory Overheads	60,000
Add: Opening WIP	15,000
Less: Closing WIP	(10,000)
Works Cost	**3,65,000**
Add: Administration Overheads	40,000
Cost of Production	**4,05,000**
Add: Opening Finished Goods	25,000
Less: Closing Finished Goods	(20,000)
Cost of Goods Sold	**4,10,000**
Add: Selling & Distribution Overheads	30,000

Particulars	Amount (₹)
Cost of Sales	**4,40,000**
Add: Profit	75,000
Sales	**₹5,15,000**

Notes:

- **Prime Cost** = Direct Material + Direct Labour + Direct Expenses
- **Works Cost** = Prime Cost + Factory Overheads ± Work-in-Progress
- **Cost of Production** = Works Cost + Administration Overheads
- **Cost of Goods Sold** = Cost of Production ± Finished Goods
- **Cost of Sales** = Cost of Goods Sold + Selling & Distribution Overheads
- **Sales** = Cost of Sales + Profit

UNIT - II

LESSON 2.1 BUDGET, BUDGETING AND BUDGETARY CONTROL

Learning Objectives: After studying this lesson you are able to understand:

- The meaning of budget, budgeting and budgetary control
- The objectives and process of Budgetary Control
- Different types of Budget and its preparation.
- Capital Budgeting and Its Techniques
- Zero Based Budgeting
- Performance Budgeting

Contents:

- Introduction
- Definition of Budget
- Budgeting
- Budgetary Control
- Elements of budgetary control
- Installation of Budgetary Control System
- Types of Budgeting
- preparation of budgets
- Cash budget
- Capital budgeting
- Zero base budgeting (ZBB)
- Performance budgeting
- Master budget
- Budgetary control and standard costing
- Self Assessment Questions

Introduction

To achieve the organizational objectives, an enterprise should be managed effectively and efficiently. It is facilitated by chalking out the course of action in advance. Planning, the primary function of management helps to chalk out the course of actions in advance. But planning has to be followed by continuous comparison of the actual performance with the planned performance, i. e., controlling. One systematic approach in effective follow up process is budgeting. Different budgets are prepared by the enterprise for different purposes. Thus, budgeting is an integral part of management.

Definition of Budget

Fremgen, James M – in his book Accounting for Managerial Analysis defines the term budget as "a comprehensive and coordinated plan, expressed in financial terms, for the operations and resources of an enterprise for some specific period in the future'. According to **Gordon and Shillinglaw** 'A budget is a predetermined detailed plan of action developed and distributed as a guide to current operations and as a partial basis for the subsequent evaluation of performance'. 'A budget is a financial and/or quantitative statement, prepared prior to a defined period of time, of the policy to be pursued during the period for the purpose of attaining a given objective'. **(The Chartered Institute of Management Accountants, London)**

Elements of Budget

The key elements of a budget are:-

- It is a comprehensive and coordinated plan of action.
- It is a plan for the firm's operations and resources.
- It is based on objectives to be attained.
- It is related to specific future period.
- It is expressed in financial and/or physical units.

Budgeting

Budgeting is the process of preparing and using budgets to achieve management objectives. It is the systematic approach for accomplishing the planning, coordination, and control responsibilities of management by optimally utilizing the given resources.

'The entire process of preparing the budgets is known as Budgeting' **(J. Batty)**

'Budgeting may be said to be the act of building budgets' **(Rowland & Harr)**

Elements of Budgeting

- State clearly the firm's expectations and facilitate their attainability.
- Needs the utilization of various persons at different levels while preparing the budgets.
- The authority and responsibility should be properly fixed.
- Realistic targets are to be fixed.
- A good system of accounting is also essential.
- Full support of the top management is necessary.
- Budgeting education is to be imparted among the employees.
- Proper reporting system should be introduced.
- Availability of working capital is to be ensured.

Budgetary Control

CIMA, London defines budgetary control as, "the establishment of the budgets relating to the responsibility of executives to the requirements of a policy and the continuous comparison of actual with budgeted result either to secure by individual action the objectives of that policy or to provide a firm basis for its revision"

Wheldon defines 'Budgetary Control is a planning in advance of the various functions of a business so that the business as a whole is controlled'.

Brown and Howard define the term 'Budgetary Control' is a system of controlling costs which includes the preparation of budgets, coordinating the department and establishing responsibilities, comprising actual performance with the budgeted and acting upon results to achieve maximum profitability.

Elements of budgetary control

- ✓ Establishment of budgets for each function and division of the organization.
- ✓ Regular comparison of the actual performance with the budget to know the variations from budget and placing the responsibility of executives to achieve the desired result as estimated in the budget.
- ✓ Taking necessary remedial action to achieve the desired objectives, if there is a variation of the actual performance from the budgeted performance.
- ✓ Revision of budgets when the circumstances change.
- ✓ Elimination of wastes and increasing the profitability.

Thus, budget is a blue print of a plan expressed in quantitative terms. Budgeting is a technique for formulating budgets. Budgetary Control refers to the principles, procedures and practices of achieving given objectives through budgets.

According to Rowland and William, 'Budgets are the individual objectives of a department, whereas Budgeting may be the act of building budgets. Budgetary control embraces all and in addition includes the science of planning the budgets to effect an overall management tool for the business planning and control'.

Objectives of Budgetary Control

Budgetary Control assists the management in the allocation of responsibilities and is a useful device to estimate and plan the future course of action. The general objectives of budgetary control are as follows:

1. Planning:

(a) A budget is an action plan and it is prepared after a careful study and research.

(b) A budget operates as a mechanism through which objectives and policies are carried out.

(c) It is a communication channel among various levels of management.

(d) It is helpful in selecting a most profitable alternative.

(e) It is a complete formulation of the policy to be pursued for attaining given objectives.

2. Co-ordination

It coordinates various activities of the business to achieve its common objectives. It induces the executives to think and operate as a group.

3. Control

Control is necessary to judge that the performance of the organization confirms to the plans of business. It compares the actual performance with that of the budgeted performance, ascertains the deviations, if any, and takes corrective action at once.

Installation of Budgetary Control System

Installation a good budgetary control system in an organization involves:

1. Determination of the Objectives
2. Organization for Budgeting
3. Budget Centre
4. Budget Officer
5. Budget Manual
6. Budget Committee
7. Budget Period
8. Determination of Key Factor

1. Determination of Objectives

It is very clear that the installation of a budgetary control system presupposes the determination of objectives sought to be achieved by the organization in clear terms.

2. Organization for Budgeting

Having determined the objectives clearly, proper organization is essential for the successful preparation, maintenance and administration of budgets. The responsibility of each executive must be clearly defined. There should be no uncertainty regarding the jurisdiction of executives.

3. Budget Centre

It is that part of the organization for which the budget is prepared. It may be a department or any other part of the department. It is essential for the appraisal of performance of different departments so as to make them responsible for their budgets.

4. Budget Officer

A Budget Officer is a convener of the budget committee. He coordinates the budgets of various departments. The managers of different departments are made responsible for their department's performance.

5. Budget Manual

It is a document which defines the objectives of budgetary control system. It spells out the duties and responsibilities of budget officers regarding the preparation and execution of budgets. It also specifies the relations among various functionaries.

6. Budget Committee

The heads of all important departments are made members of this committee. It is responsible for preparation and execution of budgets. The members of this committee may sometimes take collective decisions, if necessary. In small concerns, the accountant is made responsible for the same work.

7. Budget Period

It is the period for which a budget is prepared. It depends upon a number of factors. It may be different for different concerns/functions. The factors that determine the budget period are the type of budget, the nature of demand for the products, the availability of finance, the economic situation of the cycle and the length of trade cycle

8. Determination of Key Factor

Generally, the budgets are prepared for all functional areas of the business. They are inter related and inter-dependent. Therefore, a proper coordination is necessary. There may be many factors that influence the preparation of a budget. For example, plant capacity, demand position, availability of raw materials, etc. Some factors may have an impact on other budgets also. A factor which influences all other budgets is known as Key factor. The key factor may not remain the same. Therefore, the organization must pay due attention on the key factor in the preparation and execution of budgets.

Types of Budgeting

Budget can be classified into three categories from different points of view. They are:

According to Function:

(a) Sales Budget: The budget which estimates total sales in terms of items, quantity, value, periods, areas, etc is called Sales Budget.

(b) Production Budget: It estimates quantity of production in terms of items, periods, areas, etc. It is prepared on the basis of Sales Budget.

(c) Cost of Production Budget: This budget forecasts the cost of production. Separate budgets may also be prepared for each element of costs such as direct materials budgets, direct labour budget, factory materials budgets, office overheads budget, selling and distribution overheads budget, etc.

(d) Purchase Budget: This budget forecasts the quantity and value of purchase required for production. It gives quantity wise, money wise and period wise particulars about the materials to be purchased.

(e) Personnel Budget: The budget that anticipates the quantity of personnel required during a period for production activity is known as Personnel Budget.

(f) Research Budget: This budget relates to the research work to be done for improvement in quality of the products or research for new products.

(g) Capital Expenditure Budget: This budget provides a guidance regarding the amount of capital that may be required for procurement of capital assets during the budget period.

(h) Cash Budget: This budget is a forecast of the cash position by time period for a specific duration of time. It states the estimated amount of cash receipts and estimation of cash payments and the likely balance of cash in hand at the end of different periods.

(i) Master Budget: It is a summary budget incorporating all functional budgets in a capsule form. It interprets different functional budgets and covers within its range the preparation of projected income statement and projected balance sheet.

II. According to Flexibility:

On the basis of flexibility, budgets can be divided into two categories. They are:

1. Fixed Budget:

Fixed Budget is one which is prepared on the basis of a standard or a fixed level of activity. It does not change with the change in the level of activity.

2. Flexible Budget:

A budget prepared to give the budgeted cost of any level of activity is termed as a flexible budget. According to CIMA, London, a Flexible Budget is, 'a budget designed to change in accordance with level of activity attained'. It is prepared by taking into account the fixed and variable elements of cost.

III. According to Time:

On the basis of time, the budget can be classified as follows:

1. Long-term Budget:

A budget prepared for considerably long period of time, viz., 5 to 10 years is called Long-term Budget. It is concerned with the planning of operations of the firm. It is generally prepared in terms of physical quantities.

2. Short-term Budget:

A budget prepared generally for a period not exceeding 5 years is called Short-term Budget. It is generally prepared in terms of physical quantities and in monetary units.

3. Current Budget:

It is a budget for a very short period, say, a month or a quarter. It is adjusted to current conditions. Therefore, it is called current budget.

4. Rolling Budget:

It is also known as Progressive Budget. Under this method, a budget for a year in advance is prepared. A new budget is prepared after the end of each month/quarter for a full year ahead. The figures for the month/quarter which has rolled down are dropped and the figures for the next month/quarter are added. This practice continues whenever a month/quarter ends and a new month/quarter begins.

PREPARATION OF BUDGETS:

I. SALES BUDGET:

Sales budget is the basis for the preparation of other budgets. It is the forecast of sales to be achieved in a budget period. The sales manager is directly responsible for the preparation of this budget. The following factors are taken into consideration:

a. Past sales figures and trend
b. Salesmen's estimates
c. Plant capacity
d. General trade position
e. Orders in hand
f. Proposed expansion
g. Seasonal fluctuations
h. Market demand
i. Availability of raw materials and other supplies
j. Financial position

k. Nature of competition

l. Cost of distribution

m. Government controls and regulations

n. Political situation.

Example 1. The Latha Steel Industries has prepared its annual sales forecast, expecting to achieve sales of Rs.60, 00,000 2016-17. The Controller is uncertain about the pattern of sales to be expected by month and asks you to prepare a monthly budget of sales. The following is the sales data pertain to the year 2015-6 which is considered to be representative of a normal year:

Month	**Sales (Rs.)**	**Month**	**Sales (Rs.)**
January	2,20,000	July	5,20,000
February	2,30,000	August	6,60,000
March	2,00,000	September	6,80,000
April	2,80,000	October	7,00,000
May	3,60,000	November	4,00,000
June	4,50,000	December	3,00,000

Prepare a monthly sales budget for the coming year on the basis of the above data.

Answer:

Sales Budget

Month	Sales (given)	Sales estimation based on cash sales ratio given Monthly sales given/yearly sales *Forecasted sales of 206-17
January	2,20,000	2,64,000
February	2,30,000	2,76,000
March	2,00,000	2,40,000
April	2,80,000	3,36,000
May	3,60,000	4,32,000
June	4,50,000	5,40,000
July	5,20,000	6,24,000
August	6,60,000	7,92,000
September	6,80,000	8,16,000
October	7,00,000	8,40,000
November	4,00,000	4,80,000
December	3,00,000	3,60,000
Total	**50,00,000**	**60,00,000**

Note: Sales budget is prepared based on last year's month-wise sales ratio.

Example: 2. M/s. Saravana Traders produces two types of products, viz., X and Y and sells them in Chennai and Mumbai markets. The following information is made available for the current year:

Market	Product	Budgeted Sales	Actual Sales
Chennai	X	400 units @ Rs.9 each	500 units @ Rs.9 each
,,	Y	300 units @ Rs.21 each	200 units @ Rs.21 each
Mumbai	X	600 units @ Rs.9 each	700 units @ Rs.9 each
	Y	500 units @ Rs.21 each	400 units @ Rs.21 each

Market studies reveal that Raja is popular as it is under priced. It is observed that if its price is increased by Re.1 it will find a readymade market. On the other hand, Rani is overpriced and market could absorb more sales if its price is reduced to Rs.20. The management has agreed to give effect to the above price changes.

On the above basis, the following estimates have been prepared by Sales Manager:

Product	% increase in sales over current budget	
	Chennai	Mumbai
X	+10%	+ 5%
Y	+ 20%	+ 10%

With the help of an intensive advertisement campaign, the following additional sales above the estimated sales of sales manager are possible:

Product	Chennai	Mumbai
X	60 units	70 units
Y	40 units	50 units

You are required to prepare a budget for sales incorporating the above estimates.

Answer:

Sales Budget

Area	Product	Budget for current year			Actual sales			Budget for future period		
		Units	**Price Rs.**	**Value Rs.**	**Units**	**Price Rs.**	**Value Rs.**	**Units**	**Price Rs.**	**Value Rs.**
Chennai	X	400	9	3600	500	9	4500	500	10	5000
	Y	300	21	6300	200	21	4200	400	20	8000
	Total	**700**		**9900**	**700**		**8700**	**900**		**13000**
Mumbai	X	600	9	5400	700	9	6300	700	10	7000
	Y	500	21	10500	400	21	8400	600	20	12000
	Total	**1100**		**15900**	**1100**		**14700**	**1300**		**19000**
Total	X	1000	9	9000	1200	9	10800	1200	10	12000
	Y	800	21	16800	600	21	12600	1000	20	20000
Total Sales		**1800**		**25800**	**1800**		**23400**	**2200**		**32000**

Workings:

	Budgeted sales for Chennai		Budgeted sales for Mumbai	
	X Units	Y Units	X Units	Y Units
Budgeted Sales	400	300	600	500
Add: Increase	(10%) 40	(20%) 60	(5%) 30	(10%) 50
	440	360	630	550
Increase due to advertisement	60	40	70	50
Total	500	400	700	600

II. PRODUCTION BUDGET:

Production = Sales + Closing Stock – Opening Stock

Example: 3. The sales of a concern for the next year is estimated at 50,000 units. Each unit of the product requires 2 units of Material ‘A’ and 3 units of Material ‘B’. The estimated opening balances at the commencement of the next year are:

Finished Product : 10,000 units
Raw Material 'A' : 12,000 units
Raw Material 'B' : 15,000 units

The desirable closing balances at the end of the next year are:

Finished Product : 14,000 units
Raw Material 'A' : 13,000 units
Raw Material 'B' : 16,000 units

Prepare the materials purchase budget for the next year.

Answer:

Production Budget

Estimated Sales	50,000 units
Add: Estimated Closing Finished Goods	14,000 ,,
	64,000 ,,
Less: Estimated Opening Finished Goods	10,000 ,,
Production	54,000 ,,

Materials Purchase Budget

	Material 'A'	Material 'B'
Material Consumption For production of 54,000 units (A -2units B – 3 Units)	1,08,000 units	1,62,000 units
Add: Closing stock of materials	13,000 ,,	16,000 ,,
	1,21,000 ,,	**1,78,000 ,,**
Less: Opening stock of materials	12,000 ,,	15,000 ,,
Materials to be purchased	**1,09,000 ,,**	**1,63,000 ,,**

III. CASH BUDGET

It is an estimate of cash receipts and disbursements during a future period of time. "The Cash Budget is an analysis of flow of cash in a business over a future, short or long period of time. It is a forecast of expected cash intake and outlay" (Soleman, Ezra – Handbook of Business administration).

Procedure for preparation of Cash Budget:

1. First take into account the opening cash balance, if any, for the beginning of the period for which the cash budget is to be prepared.

2. Then Cash receipts from various sources are estimated. It may be from cash sales, cash collections from debtors/bills receivables, dividends, interest on investments, sale of assets, etc.
3. The Cash payments for various disbursements are also estimated. It may be for cash purchases, payment to creditors/bills payables, payment to revenue and capital expenditure, creditors for expenses, etc.
4. The estimated cash receipts are added to the opening cash balance, if any.
5. The estimated cash payments are deducted from the above proceeds.
6. The balance, if any, is the closing cash balance of the month concerned.
7. The closing cash balance is taken as the opening cash balance of the following month.
8. Then the process is repeatedly performed.
9. If the closing balance of any month is negative i.e the estimated cash payments exceed estimated cash receipts, then overdraft facility may also be arranged suitably.

Example: 4. From the following budgeted figures prepare a Cash Budget in respect of three months to June 30, 2016.

Month	**Sales Rs.**	**Materials Rs.**	**Wages Rs.**	**Overheads Rs.**
January	60,000	40,000	11,000	6,200
February	56,000	48,000	11,600	6,600
March	64,000	50,000	12,000	6,800
April	80,000	56,000	12,400	7,200
May	84,000	62,000	13,000	8,600
June	76,000	50,000	14,000	8,000

Additional information:

1. Expected Cash balance on 1st April, 2016 – Rs. 20,000
2. Materials and overheads are to be paid during the month following the month of supply.
3. Wages are to be paid during the month in which they are incurred.
4. All sales are on credit basis.

5. The terms of credits are payment by the end of the month following the month of sales: Half of credit sales are paid when due the other half to be paid within the month following actual sales.
6. 5% sales commission is to be paid within in the month following sales
7. Preference Dividends for Rs. 30,000 is to be paid on 1st May.
8. Share call money of Rs. 25,000 is due on 1st April and 1st June.
9. Plant and machinery worth Rs. 10,000 is to be installed in the month of January and the payment is to be made in the month of June.

Answer:

Cash Budget for three months from April to June, 2016

Particulars	April Rs.	May Rs.	June Rs.
Opening Cash Balance	20,000	32,000	(-) 5,600
Add: Estimated Cash Receipts:			
Sales Collection from debtors	60,000	72,000	82,000
Share call money	25,000		25,000
	1,05,000	1,04,600	1,01,400
Less: Estimated Cash Payments:			
Materials	50,000	56,000	62,000
Wages	12,400	13,000	14,000
Overheads	6,800	7,200	8,600
Sales Commission	3,200	4,000	4,200
Preference Dividend	---	30,000	---
Plant and Machinery	---	---	10,000
	72,400	1,10,200	98,800
Closing Cash Balance	32,600	(-) 5,600	2,600

Workings:

1. Sales Collection:

Payment is due at the month following the sales. Half is paid on due and other half is paid during the next month. Therefore, February sales Rs. 50,000 is due at the end of March. Half is given at the end of March and other half is given in the next month i.e., in the month of April. Hence, the sales collection for the month of April will be as follows:

For April – Half of February Sales (56,000 x ½) = 28,000

- Half of March Sales (64,000 x ½) = 32,000

Total Collection for April = 60,000

Similarly, the sales collection for the months of May and June may be calculated.

2. Materials and overheads:

These are paid in the following month. That is March is paid in April, April is paid in May and May is paid in June.

3. Sales Commission:

It is paid in the following month. Therefore,

For April – 5% of March Sales (64,000 x 5 /100) = 3,200

For May – 5% of March Sales (80,000 x 5 /100) = 4,000

For April – 5% of March Sales (84,000 x 5 /100) = 4,200

IV. FLEXIBLE BUDGET:

A flexible budget consists of a series of budgets for different level of activity. Therefore, it varies with the level of activity attained. According to CIMA, London, A Flexible Budget is, 'a budget designed to change in accordance with level of activity attained'. It is prepared by taking into account the fixed and variable elements of cost. This budget is more suitable when the forecasting of demand is uncertain.

Points to be remembered while preparing a flexible budget:

1. Cost has to be classified into fixed and variable cost.
2. Total fixed cost remains constant at any level of activity.
3. Total Variable cost varies in the same proportion at which the level of activity varies.
4. Fixed and variable portion of Semi-variable cost is to be segregated.

Example: 5. The following information at 50% capacity is given. Prepare a flexible budget and forecast the profit or loss at 60%, 70% and 90% capacity.

Fixed expenses:	**Expenses at 50% capacity (Rs.)**
Salaries	5,000
Rent and taxes	4,000
Depreciation	6,000

Administrative expenses	7,000
Variable expenses:	
Materials	20,000
Labour	25,000
Others	4,000
Semi-variable expenses:	
Repairs	10,000
Indirect Labour	15,000
Others	9,000

It is estimated that fixed expenses will remain constant at all capacities. Semi-variable expenses will not change between 45% and 60% capacity, will rise by 10% between 60% and 75% capacity, a further increase of 5% when capacity crosses 75%.

Estimated sales at various levels of capacity are:

Capacity	60%	70%	90%
Sales (Rs.)	1,10,000	1,30,000	1,50,000

Answer:

FLEXIBLE BUDGET

(Showing Profit & Loss at various capacities)

Particulars	**Capacities**			
	50%	**60%**	**70%**	**90%**
	Rs.	**Rs.**	**Rs.**	**Rs.**
Fixed Expenses:				
Salaries	5,000	5,000	5,000	5,000
Rent and taxes	4,000	4,000	4,000	4,000
Depreciation	6,000	6,000	6,000	6,000
Administrative expenses	7,000	7,000	7,000	7,000
Variable expenses:				
Materials	20,000	24,000	28,000	36,000
Labour	25,000	30,000	35,000	45,000
Others	4,000	4,800	5,600	7,200
Semi-variable expenses:				
Repairs	10,000	10,000	11,000	11,500
Indirect Labour	15,000	15,000	16,500	17,250
Others	9,000	9,000	9,900	10,350
Total Cost	1,05,000	1,14,800	1,28,000	1,49,300
Profit (+) or Loss (-)		(-) 4,800	(+) 2,000	(+) 700
Estimated Sales		1,10,000	1,30,000	1,50,000

Example: 6. The following information relates to a flexible budget at 60% capacity. Find out the overhead costs at 50% and 70% capacity and also determine the overhead rates:

Particulars	Expenses at 60% capacity
Variable overheads:	Rs.
Indirect Labour	10,500
Indirect Materials	8,400
Semi-variable overheads:	
Repair and Maintenance (70% fixed; 30% variable)	7,000
Electricity (50% fixed; 50% variable)	25,200
Fixed overheads:	
Office expenses including salaries	70,000
Insurance	4,000
Depreciation	20,000
Estimated direct labour hours	**1,20,000 hours**

Answer:

FLEXIBLE BUDGET

	50 % Capacity	60% Capacity	70% Capacity
	Rs.	Rs.	Rs.
Variable overheads:			
Indirect Labour	8,750	10,500	12,250
Indirect Materials	7,000	8,400	
Semi-variable overheads:			
Repair and Maintenance (1)	6,650	7,000	
Electricity (2)	23,100	25,200	
Fixed overheads:			
Office expenses including salaries	70,000	70,000	70,000
Insurance	4,000	4,000	4,000
Depreciation	20,000	20,000	20,000
Total overheads	**1,39,500**	**1,45,100**	**1,50,700**
Estimated direct labour hours	1,00,000	1,20,000	1,50,000
Overhead rate per hour (Rs.)	1.395	1.21	1.077

Workings:

1. The amount of Repairs and maintenance at 60% Capacity is Rs. 7,000. Out of this, 70% (i.e Rs. 4,900) is fixed and remaining 30% (i.e Rs. 2,100) is variable. The fixed portion

remains constant at all levels of capacities. Only the variable portion will change according to change in the level of activity. Therefore, the total amount of repairs and maintenance for 50% and 70% capacities are calculated as follows:

Repairs and maintenance	50%	**60%**	70%
Fixed (70%)	4,900	**4,900**	4,900
Variable (30%)	1,750	**2,100**	2,450
Total	6,650	**7,000**	7,350

2. Similarly, electricity expenses at different levels of capacity are calculated as follows:

Electricity	**50%**	**60%**	**70%**
Fixed (50%)	12,600	**12,600**	12,600
Variable (50%)	10,500	**12,600**	14,700
Total	23,100	**25,200**	27,300

Capital budgeting

Capital budgeting is a managerial technique of planning capital expenditure in consonance with the overall objectives of the firm. Capital budgeting is a double-edged tool that analyses investment opportunities and cost of capital simultaneously while evaluating worthwhile of a project. A wide range of criteria has been suggested to judge the worthwhile of investment projects. Capital projects need to be thoroughly evaluated as to costs and benefits. The costs of capital projects include the initial investment at the inception of the project. Initial investment made in land, building, plant and machinery, equipment, furniture, fixtures etc. generally gives the installed capacity.

Investment Evaluation Criteria

The capital budgeting process begins with assembling of investment proposals of different departments of a firm. The departmental head will have innumerable alternative projects available to meet his requirements. He has to select the best alternative from among the conflicting proposals. This selection is made after estimating return on the projects and comparing the same with the cost of capital. Investment proposal which gives the highest net marginal return will be chosen.

Following are the steps involved in the evaluation of an investment:

1) Estimation of cash flows
2) Estimation of the required rate of return
3) Application of a decision rule for making the choice

Features required by Investment Evaluation Criteria

A sound appraisal technique should be used to measure the economic worth of an investment project. Porterfield, J.T.S. in his book, Investment Decisions and Capital Costs, has outlined some of the features that must be had by sound investment evaluation criteria.

- It should consider all cash flows to determine the true profitability of the project.
- It should provide for an objective and unambiguous way of separating good projects from bad projects.
- It should help ranking of projects according to their true profitability.
- It should recognise the fact that bigger cash flows are preferable to smaller ones and early cash flows are preferable to later ones.
- It should help to choose among mutually exclusive projects that project which maximises the shareholders' wealth.
- It should be a criterion which is applicable to any conceivable investment project independent of others.

Techniques of Capital Budgeting

Discounted Cash Flow (DCF) Criteria

- Net present value (NPV)
- Internal rate of return (IRR)
- Profitability index (PI)

Non-discounted Cash Flow Criteria

- Pay-back period
- Discounted payback period
- Accounting rate of return (ARR).

Non-discounted Cash Flow Criteria

Payback period Method: This method is popularly known as pay off, pay-out, recoupment period method also. It gives the number of years in which the total investment in a particular capital expenditure pays back itself. This method is based on the principle that every capital expenditure pays itself back over a number of years. It means that it generates income within a certain period. When the total earnings (or net cash-inflow] from investment equals the total outlay, that period is the payback period of the capital investment. An investment project is adopted so long as it pays for itself within a specified period of time — says 5 years or less. This standard of recoupment period is settled by the management taking into account a number of considerations. While *there is a* comparison between two or more *projects, the lesser the number of payback years, the project will be* acceptable.

The formula for the payback period calculation is simple. First of all, net-cash-inflow is determined. Then we divide the initial cost (or any value we wish to recover) by the annual cash-inflows and the resulting quotient is the payback period. As per formula:

$$\text{Payback period} = \frac{\text{Original Investment}}{\text{Annual Cash-inflows}}$$

If the annual cash-inflows are uneven, then the calculation of payback period takes a cumulative form. We accumulate the annual cash-inflows till the recovery of investment and as soon as this amount is recovered, it is the expected number of payback period years. An asset or capital expenditure outlay that pays back itself early comparatively is to be preferred.

Following are some of the advantages of pay back method:

(1) It is easy to understand, compute and communicate to others. Its quick computation makes it a favourite among executive who prefer snap answers.

(2) It gives importance to the speedy recovery of investment in capital assets. So it is useful technique in industries where technical developments are in full swing necessitating the replacements at an early date.

(3) It is an adequate measure for firms with very profitable internal investment opportunities, whose sources of funds are limited by internal low availability and external high costs.

(4) It is useful for approximating the value of risky investments whose rate of capital wastage (economic depreciation and obsolescence rate) is hard to predict. Since the payback period method weights only return heavily and ignores distant returns it contains a built-in hedge against the possibility of limited economic life.

(5) When the payback period is set at a large "number of years and incomes streams are uniform each year, the payback criterion is a good approximation to the reciprocal of the internal rate of discount.

Payback Method – Demerits: This method has its own limitations and disadvantages despite its simplicity and rapidity. They are:

(1) It treats each asset individually in isolation with the other assets, while assets in practice can not be treated in isolation.

(2) The method is delicate and rigid. A slight change in the division of labour and cost of maintenance will affect the earnings and such may also affect the payback period.

(3) It overplays the importance of liquidity as a goal of the capital expenditure decisions. While no firm can ignore its liquidity requirements but there are more direct and less costly means of safeguarding liquidity levels. The overlooking of profitability and over stressing the liquidity of funds can in no way be justified.

(4) It ignores capital wastage and economic life by restricting consideration to the projects' gross earnings.

(5) It ignores the earning beyond the payback period while in many cases these earnings are substantial. This is true particularly in respect of research and welfare projects.

(6) It overlooks the cost of capital which is the main basis of sound investment decisions.

In perspective, the universality of the payback criterion as a reliable index of profitability is questionable. It violates the first principle of rational investor behaviour-namely that large returns are preferred to smaller ones. However, it can be applied in assessing the profitability of short and medium term capital expenditure projects.

Accounting Rate of Return Method - It is also known as Accounting Rate of Return Method / Financial Statement Method/ Unadjusted Rate of Return Method also. According to this method, capital projects are ranked in order of earnings. Projects which yield the highest earnings are selected and others are ruled out. The return on investment method can be expressed in several ways a follows:

(i) Average Rate of Return Method - Under this method we calculate the average annual profit and then we divide it by the total outlay of capital project. Thus, this method establishes the ratio between the average annual profits and total outlay of the projects.

As per formula,

$$\text{Rate of Return} = \frac{\text{Average Annual Profits}}{\text{Outlay of the Project}} \times 100$$

Thus, the average rate of return method considers whole earnings over the entire economic life of an asset. Higher the percentage of return, the project will be acceptable.

(ii) **Earnings per unit of Money Invested -** As per this method, we find out the total net earnings and then divide it by the total investment. This gives us the average rate of return per unit of amount (i.e. per rupee) invested in the project. As per formula:

$$\text{Earnings per unit of investment} = \frac{\text{Total Earnings}}{\text{Total Outlay of the Project}}$$

The higher the earnings per unit, the project deserves to be selected.

(iii) Return on Average Amount of Investment Method - Under this method the percentage return on average amount of investment is calculated. To calculate the average investment the outlay of the projects is divided by two. As per formula:

$$\text{Average Investment} = \frac{\text{Unrecovered Capital at the beginning} + \text{Unrecovered capital at the end}}{2}$$

$$\text{Or} \quad = \frac{\text{Initial investment + scrap value}}{2}$$

$$\text{Or} \quad = \frac{\text{Investment}}{2}$$

$$\text{Rate of Return} = \frac{\text{Average Annual Net Income (Savings)}}{\text{Average Investment}} \times 100$$

Here:

Average Annual Net Income = Average Annual Cash- inflow - Depreciation

Thus, we see that the rate of return approach can be applied in various ways. But, however, in our opinion the third approach is more reasonable and consistent.

Merits of Accounting Rate of Return

(1) Like payback method it is also simple and easy to understand.

(2) It takes into consideration the total earnings from the project during its entire economic life.

(3) This approach gives due weight to the profitability of the project.

(4) In investment with extremely long lives, the simple rate of return will be fairly close to the true rate of return. It is often used by financial analysis to measure current performance of a firm.

Demerits of ARR

(1) One apparent disadvantage of this approach is that its results by different methods are inconsistent.

(2) It is simply an averaging technique which does not take into account the various impacts of external factors on over-all profits of the firm.

(3) This method also ignores the time factor which is very crucial in business decision.

(4) This method does not determine the fair rate of return on investments. It is left to the discretion of the management.

Discounted Cash flows Techniques

Another method of computing expected rates of return is the present value method. The method is popularly known as Discounted Cash flow Method also. This method involves calculating the present value of the cash benefits discounted at a rate equal to the firm's cost of capital. In other words, the "present value of an investment is the maximum amount a firm could pay for the opportunity of making the investment without being financially worse off."

The financial executive compares the present values with the cost of the proposal. If the present value is greater than the net investment, the proposal should be accepted. Conversely, if the present value is smaller than the net investment, the return is less than the cost of financing. Making the investment in this case will cause a financial loss to the firm.

There are four methods to judge the profitability of different proposals on the basis of this technique

(i) **Net Present Value Method -** This method is also known as Excess Present Value or Net Gain Method. To implement this approach, we simply find the present value of the expected net cash inflows of an investment discounted at the cost of capital and subtract from it the initial cost outlay of the project. If the net present value is positive, the project should be accepted: if negative, it should be rejected.

NPV = Total Present value of cash inflows – Net investment

If the two projects are mutually exclusive the one with higher net present value should be chosen. The following example will illustrate the process:

Assume, the cost of capital after taxes of a firm is 6%. Assume further, that the net cash-inflow (after taxes) on a Rs. 5,000 investment is forecasted as being ₹2,800 per annum for 2 years. The present value of this stream of net cash-inflow discounted at 6% comes to ₹ 5,272 (1,813 x ₹ 2800).

Therefore, the present value of the cash inflow = ₹ 5,272

Less present value of net investment	=	₹ 5,000
Net Present value		₹ 272

(ii) **Internal Rate of Return Method -** This method is popularly known as time adjusted rate of return method/discounted rate of return method also. The internal rate of return is defined as the interest rate that equates the present value of expected future receipts to the cost of the investment outlay. This internal rate of return is found by trial and error. First we compute the present value of the cash-flows from an investment, using an arbitrarily elected interest rate. Then we compare the present value so obtained with the investment cost. If the present value is higher than the cost figure, we try a higher rate of interest and go through the procedure again. Conversely, if the present value is lower than the cost, lower the interest rate and repeat the process. The interest rate that brings about this equality is defined as the internal rate of return. This rate of return is compared to the cost of capital and the project having higher difference, if they are mutually exclusive, is adopted and other one is rejected. As the determination of internal rate of return involves a number of attempts to make the present value of earnings equal to the investment, this approach is also called the Trial and Error Method,

(iii) **Profitability Index Method -** One major disadvantage of the present value method is that it is not easy to rank projects on the basis of net present value particularly when the cost of projects differs significantly. To compare such projects the present value profitability index is prepared. The index establishes relationship between cash-inflows and the amount of investment as per formula given below:

$$\text{V. Index} = \frac{\text{NPV}}{\text{Investment}} \times 100 \text{ or } \frac{\text{GPV}}{\text{Investment}} \times 100$$

For example, the profitability index of the Rs. *5,000* investment discussed in Net Present Value Method above would be:

$$\frac{272}{3000} \text{ X } 100 = 5.44 \text{ or } \frac{5272}{5000} \times 100 = 105.44$$

The higher profitability index, the more desirable is the investment. Thus, this index provides a ready compatibility of investment having various magnitudes. By computing

profitability indices for various projects, the financial manager can rank them in order of their respective rates of profitability.

(iv) **Terminal Value Method** - This approach separates the timing of the cash-inflows and outflows more distinctly. Behind this approach is the assumption that each cash-inflow is re-invested in other assets at the certain rate of return from the moment, it is received until the termination of the project. Then the present value of the total compounded sum is calculated and it is compared with the initial cash-outflow. The decision rule is that if the present value of the sum total of the compounded re-invested cash-inflows is greater than the present value of cash-outflows, the proposed project is accepted otherwise not. The firm would be different if both the values are equal.

This method has a number of advantages. It incorporates the advantage of re-investment of cash-inflows by compounding and then discounting it. Further, it is best suited to cash budgeting requirements. The major practical problem of this method lies in projecting the future rates of interest at which the intermediate cash inflows received will be re-invested.

ZERO BASE BUDGETING (ZBB)

It is a management technique aimed at cost reduction. It was introduced by the U. S. Department of Agriculture in 1961. Peter A. Phyrr popularized it. In 1979, president Jimmy Carte issued a mandate asking for the use of ZBB by the Government.

Peter A. Phyrr **defines ZBB**

"It is a planning and budgeting process which requires each manager to justify his entire budget request in detail from scratch (Zero Base) and shifts the burden of proof to each manager to justify why he should spend money at all. The approach requires that all activities be analyzed in decision packages, which are evaluated by systematic analysis and ranked in the order of importance". It implies that-

- Every budget starts with a zero base
- No previous figure is to be taken as a base for adjustments
- Every activity is to be carefully examined afresh

- Each budget allocation is to be justified on the basis of anticipated circumstances
- Alternatives are to be given due consideration

Advantages of ZBB:

1. Effective cost control can be achieved
2. Facilitates careful planning
3. Management by Objectives becomes a reality
4. Identifies uneconomical activities
5. Controls inefficiencies
6. Scarce resources are used judiciously
7. Examines each activity thoroughly
8. Controls wasteful expenditure
9. Integrates the management functions of planning and control
10. Reviews activities before allowing funds for them.

PERFORMANCE BUDGETING

It involves evaluation of the performance of the organization in the context of both specific as well as overall objectives of the organization. It provides a definite direction to each employee and a control mechanism to top management.

Performance Budgeting technique is the process of analyzing, identifying, simplifying and crystallizing specific performance objectives of a job to be achieved over a period of the job. The technique is characterized by its specific direction towards the business objectives of the organization. – The National Institute of Bank Management.

The responsibility for preparing the performance budget of each department lies on the respective departmental head. It requires preparation of performance reports. This report compares budget and actual data and shows any existing variances. To facilitate the preparation, the departmental head is supplied with the copy of the master budget appropriate to his function.

MASTER BUDGET

Master budget is a comprehensive plan which is prepared from and summarizes the functional budgets. The master budget embraces both operating decisions and financial decisions. When all budgets are ready, they can finally produce budgeted profit and loss account or income statement and budgeted balance sheet. Such results can be projected monthly, quarterly, half-yearly and at year end. When the budgeted profit falls short of target it may be reviewed and all budgets may be reworked to reach the target or to achieve a revised target approved by the budget committee

Key Factor in Budgeting

The factor which at a particular time or over a period will limit the activities of an undertaking. The limiting factor is usually the level of demand for the products or services of the undertaking but it could be a shortage of one of the productive resources such as skilled labour, raw material or machine capacity, power, customer demand, lack of capital, Bottlenecks in the different process. In order to ensure that the functional budgets are reasonably capable of fulfillment, the extent of the influence of this factor must be assessed.

BUDGETARY CONTROL AND STANDARD COSTING

The systems of budgetary control and standard costing have the common objective of controlling business operations by establishing pre-determined targets, measuring the actual performance and comparing it with the targets, for the purposes of having better efficiency and of reducing costs. These two systems are said to be interrelated but they are not inter-dependent. The budgetary control system can function effectively even without the system of standard costing in operation but the vice-versa is not true. Usually, the two are used in conjunction with each other to have most fruitful results. The distinction between the two systems is mainly on account of the field or scope and technique of operation.

Budgeting	Standard costing
1. Budgetary control is concerned with the operation of the business as a whole and hence its more extensive	1. Standard Costing is related with the control of the expenses and hence it is more intensive
2. Budget is a projection of financial accounts	2. Standard cost is the projection of cost accounts
3. It does not necessarily involve standardization of products.	3. It requires standardization of products.
4. Budgetary control can be adopted in part also.	4. It is not possible to operate this system in parts
5. Budgeting can be operated without standard costing.	5. Standard costing cannot exist with out budgeting.
6. Budgets determine the ceilings of expenses above which actual expenditure should not normally rise.	6. Standards are minimum targets which are to be attained by actual performance at specific efficiency level.

CONCLUTION

Budgeting is an important short term tool of the management for planning and control. It is a comprehensive statement of intentions expressed in financial terms. The overall budget is known as master budget. The cash budget is a device to help a firm to plan for and control the use of cash. Budget prepared for a single level of activity, with no prospect of modification in the light of changed circumstances, are referred to as fixed budget. Flexible budget is a tool in the real world situations estimates costs at several levels of activity. Thus, budgetary control refers the process of preparation of budgets for various activities and comparing the budgeting figures for arriving at deviations, if any, which are to be eliminated in future.

SELF ASSESSMENT QUESTIONS

1. What do you understand by the term Budget and Budgetary Control? State the advantages of budgetary control
2. What are the essentials of effective budgeting?
3. Discuss the difference between Fixed Budget and Flexible Budget
4. How do you differentiate the operating budget and capital budget.
5. What are the various steps in preparation of budgets?

6. What do you mean by the economics of capital budgeting? Explain the various return analysis techniques and risk analysis tools?
7. What is Pay Back Period? State its uses and limitations.
8. Differentiate the NPV and IRR techniques.
9. Distinguish between Standard Costing and Budgetary Control.
10. What do you mean by functional budget? Elicit any four such budgets.
11. Enumerate the steps involved in budgetary control.
12. A single product company estimated its sales for the next year quaterwise as under:

Quarter	I	II	III	IV
Sales Units	30000	37500	41250	45000

The opening stock of finished goods is 10000 units and the company expects to maintain the closing stock of finished goods at 16250 units at the end of the year. The production pattern in each quarter is based on 80 % of the sales of the current quarter and 20% of sales of the next quarter.

The opening stock of raw materials in the beginning of the year is 1000Kg. and the closing stock at the end of the year is required to be maintained at 5000 Kg. Each unit of finished output requires 2kg of raw materials.

The company proposes to purchase the entire annual requirement of raw material in the first three quarters in the proportion and at the prices given below:

Quarter	Purchase of raw materials % to total annual requirement in quantity	Price per Kg
I	30%	2
II	50%	3
III	20%	4

The value of the opening stock of materials in the beginning of the year is Rs.20000. you are required to prepare and present the following for the next year, quarter wise:

(i) Production budget in units. (ii) Raw material consumption budget in quantity. (iii) Raw material purchase budget in quantity and value.

13. From the following budget data, forecast the cash position for six months commencing from 1st June 2012 when the bank balance is estimated to be Rs. 1,10,000:

Month	**Sales Rs.**	**Selling OH Rs.**	**Purchases Rs.**	**Wages Rs.**	**Factory OH Rs.**	**Administr-ative OH Rs.**	**Research expenses Rs.**
Mar.	82000	5000	40000	10000	8400	3400	2000
Apr.	88500	3250	37000	8000	5680	2500	2400
May	84000	4100	40000	8400	5920	2760	2400
June	93000	3710	39060	8800	5440	2480	2400
July	72000	3210	39900	6000	5880	2600	2400
Aug.	82500	3600	39400	9600	6000	2520	2600
Sept.	88600	3450	36400	8000	5680	2700	2600
Nov	92800	3210	30574	8400	5360	2560	2600
Dec.	104400	3200	28000	7600	5850	2620	2400

Lag in payment of wages ¼ month, Lag in payment of Factory OH 1 month, Lag in payment of administration overhead ½ month, Lag in payment of selling overheads 1 month, Lag in payment research expenditure 1 month, Period of credit allowed by creditors 3 month, Period of credit allowed to debtors 2 month.

Other Information:

i. A sales commission of 5% on sales and due two month after sales is payable in addition to selling overheads.

ii. Capital expenditure planned is Plant purchased in June 2012 for Rs. 100000 payable on delivery. Building purchased in June 2012 for Rs. 8,00,000 payable in four half yearly installments the first being payable in July 2012.

iii. Interest on Bombay Port Trust Bonds amounting to Rs. 50,000 is to be received in October 2012.

iv. Cash sales per month Rs. 2000.

v. Dividend to be paid in Sept. 2012 is Rs. 10,000.

vi. Tax amounting to Rs. 30,000 is to be paid on 1st Aug. 2012.

vii. A call of Rs. 2 per share on equity share capital of Rs. 5,00,000 divided into 50,000 shares of Rs. 10 each is to be received on 1st July 2012.

14. A firm expects to have Rs.30, 000 on 1st May 1989 and requires you to prepare an estimate of the cash position during the 3 months May to July 1989.The following information is supplied to you.

Month	Sales Rs.	Purchases Rs.	Wages Rs.	Factory expenses Rs.	Office expenses Rs.	Selling expenses Rs.
March	40,000	24,000	6,000	3,000	4,000	3,000
April	46,000	28,000	6,500	3,500	4,000	3,500
May	50,000	32,000	6,500	4,000	4,000	3,500
June	72,000	36,000	7,000	4,400	4,000	4,000
July	84,000	34,000	7,250	4,250	4,000	4,000

Other Information

i) 25% of the sale is for cash, remaining amount is collected in the month following that of sale.

ii) Suppliers supply goods on two months credit.

iii) Delay in payment of wages and all other expenses: one month

iv) Income tax of Rs.10, 000 is due to be paid in July.

v) Preference share dividend of 10% on Rs. 1, 00,000 is to be paid in May.

15. The following data are available in a manufacturing company for a year period:

Fixed expenses	Rs (Lakhs)	Semi-variable Expenses	Rs (lakhs)	Variable Expenses	Rs (lakhs)
Wages& salaries	9.5	Maintenance & repairs	3.5	Material	21.7
Rent, rates & taxes	6.6	Indirect labour	7.9	Labour	20.4
Depreciation	7.4	Sales Dept. salaries	3.8	Other expenses	7.9
Sundry administrative expenses	6.5	Sundry administrative expenses	2.8		

Assume that the fixed expenses remain constant for all levels of output, semi-variable expenses remain constant between 45% and 65% of capacity increasing by 10% between 65% and 80% capacity and by 20% between 80 % and 100 % capacity.

Sales at various levels	50 %	60 %	75 %	90 %	100%
Rs (Lakhs)	100	120	150	180	200

Prepare a flexible budget for the year and forecast the profit at 60%, 75%, 90% and 100% of capacity.

16. The expenses budgeted for production of 10000 units in a factory are furnished below: materials Rs.70; labour Rs. 25; variable overheads Rs.20; fixed overhead Rs. 10; Direct variable expenses Rs. 5; selling expenses (10% fixed) Rs. 13; Distribution Expenses (20% fixed) Rs.7; Administration expenses (Fixed for all levels)Rs. 5; Total cost per unit to make & sell Rs. 155. Prepare a flexible budget for the production of (a) 8,000 units and (b) 6,000 units stating the total cost and cost per unit.

Lesson 2.2 MARGINAL COSTING

Learning Objectives: Having gone through this lesson you are able to understand:

- The idea behind Marginal Costing
- Calculation of Break-even Point
- Applications of Marginal Costing on different decision situations
- To construct Break-even chart
- The Limitations of Marginal Costing

Contents:

- Introduction
- Key concepts of marginal costing
- Application of cost-volume-profit analysis
- Break-even Chart
- Benefits of Marginal Costing
- Applications of Cost-Volume Anaysis
- Limitations of Marginal
- Solved Problems of Marginal Costing
- Summary
- Self-Assessment Questions

Introduction

Marginal costing is an important technique of costing where only variable costs are considered while calculating the cost of the product. It is a technique of presenting cost information and can be used with other methods of costing (such as job costing, contract costing, etc). This technique can be applied while taking decisions relating to profit planning, introducing a new product, level of activity planning, allocating scarce factors to profitable channels, make or buy decisions, suitable production/sales mix, fixing prices for products, etc.

According to the Institute of Cost and Management Accountants (ICMA), London, Marginal Cost is `the amount at any given volume of output by which aggregate costs are changed if the volume of output is increased or decreased by one unit'. Thus marginal cost is the added cost of an extra unit of output.

MC = Direct Material + Direct Labour + Other Variable Costs

= Total Cost – Fixed Cost.

Contribution

The difference between selling price and variable cost (or marginal cost) is known as `Contribution' or `Gross Margin'. It may be considered as some sort of fund from out of which all fixed costs are met. The difference between contribution and fixed cost represents either profit or loss, as the case may be. Contribution is calculated thus:

Contribution = Selling price – Variable cost

= Fixed Cost + Profit or – Loss

It is clear from the above equation that profit arises only when contribution exceeds fixed costs. In other terms, the point of 'no profit no loss' will be at a level where contribution is equal to fixed costs.

Marginal Cost Equation

The algebraic expression of contribution is known as Marginal Cost Equation. It can be expressed thus:

S – V = F + P = C

C = F + P and in case of loss C = F – L

Where: S = Sales V = Variable Cost

C = Contribution

F = Fixed Cost P = Profit L = Loss

Profit Volume Ratio (P/V Ratio)

The profitability of business operations can be found out by calculating the P/V Ratio. It shows the relationship between contribution and sales and is usually expressed in percentage. It is also known as `marginal-income ratio', `contribution-sales ratio' or `variable-profit ratio'. P/V Ratio thus is the ratio of contribution to sales, and is calculated thus:

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

$$= \frac{C}{S} \quad \text{or} \quad \frac{S - V}{S} \quad \text{or} \quad \frac{F + P}{S}$$

$$= 1 - \frac{\text{Variable Costs}}{\text{Sales}}$$

The ratio can also be shown by comparing the change in contribution to change in sales, or change in profit to change in sales. Any increase in contribution, obviously, would mean increase in profit, as fixed expenses are assumed to be constant at all levels of production.

$$\text{P/V Ratio} = \frac{\text{Change in Contribution}}{\text{Change in Sales}} = \frac{\text{Change in Profit}}{\text{Change in Sales}}$$

The importance of P/V Ratio lies in its use for evaluating the profitability of alternative products, proposals or schemes. A higher ratio shows greater profitability. Management should, therefore, try to increase P/V ratio by widening the gap between the selling price and the variable costs. This can be achieved by increasing sale price, reducing variable costs or switching over to more profitable products.

Break-even or Cost-Volume-Profit Analysis

Break-even analysis is a specific method of presenting and studying the inner relationship between costs, volume and profits (Hence, the name C-V-P Analysis). It is an important tool of financial analysis whereby the impact on profit of the changes in volume, price, costs and mix can be found out with a certain amount of accuracy.

Cost-volume-profit (CVP) analysis focuses on the way cost and profit change when volume changes. It is, broadly speaking, that system of analysis which determines the probable profit at any level of activity. This technique is generally used to analyse the incremental effect of volume on costs, revenues and profits. At what volume of operations are costs and revenues equal? What volume of output or sales would be necessary to earn a profit of say Rs.2 lakhs? How much profit will be earned at a volume of, say 10,000 units? What will happen if there is a reduction of 10 percent in the selling price? Questions like these are sought to be answered through CVP analysis. This detailed analysis will help the management to know the profit levels at different activity levels of production and sales and various types of costs involved in it.

CPV analysis helps in:

- forecasting the profit in an accurate manner
- preparing the flexible budgets at different levels of activity
- fixing prices for products

A business is said to break even when its total sales are equal to its total costs. It is a point of no profit or no loss. At this point contribution is equal to fixed costs. Break-even point, can be calculated thus:

$$\text{B.E.P. (in Units)} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$$

$$= \frac{\text{Fixed Cost}}{\text{Selling price/unit} - \text{Marginal cost/unit}}$$

$$\text{B.E.P. (Sales)} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}} \times \text{Selling price/unit}$$

$$= \frac{\text{Fixed Cost}}{\text{Total Contribution}} \times \text{Total Sales}$$

$$\text{or} = \frac{F \times S}{S - V}$$

$$\text{or} = \frac{\text{Fixed Cost}}{1 - \frac{\text{Variable cost per unit}}{\text{Selling price per unit}}}$$

$$\text{or} = \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$$

At break-even point the desired profit is zero. Where the volume of output or sales is to be calculated so as to earn a desired amount of profit, the amount of desired profits has to be added to the fixed cost given in the above formula.

$$\text{Units to earn a desired profit} = \frac{\text{Fixed Cost + Desired Profit}}{\text{Contribution per unit}}$$

$$\text{Sales to earn a desired profit} = \frac{\text{Fixed Cost + Desired Profit}}{\text{P/V Ratio}}$$

Cash Break-even Point

It is the level of output or sales where the cash inflow will be equivalent to cash needed to meet immediate cash liabilities. To this end, fixed costs have to be divided into two parts (i) fixed cost which do not need immediate cash outlay (depreciation etc.) and (ii) fixed cost which need immediate cash outlay (rent etc.). Cash break-even point can be calculated thus:

$$\text{Cash Break-even Point (of output)} = \frac{\text{Cash fixed costs}}{\text{Cash contribution per unit}}$$

Composite Break-even Point

Where a firm is dealing with several products, a composite breakeven point can be calculated using the following formula:

$$\text{Composite Break-even point (Sales)} = \frac{\text{Cash fixed costs}}{\text{Composite P/V Ratio}}$$

$$\text{or} = \frac{\text{Total Fixed Costs x Total Sales}}{\text{Total Contribution}}$$

$$\text{or} = \frac{\text{Total Contribution}}{\text{Total Sales}} \times 100$$

Margin of Safety

Total sales minus the sales at break-even point is known as the margin of safety. Lower break-even point means a higher margin of safety. Margin of safety can also be expressed as a percentage of total sales. The formula is:

$$\text{Margin of Safety} = \text{Total Sales} - \text{Sales at B.E.P.}$$

$$\text{or} = \frac{\text{Profit}}{\text{P/V Ratio}}$$

$$\text{Margin of Safety (as a percentage)} = \frac{\text{Margin of Safety}}{\text{Total Sales}} \times 100$$

Higher margin of safety shows that the business is sound and when sales substantially come down, (but not below breakeven sales) profit might be earned by the business. Lower margin of safety, as pointed out earlier, means that when sales come down slightly profit position might be affected

adversely. Thus, margin of safety can be used to test the soundness of a business. In order to improve the margin of safety a business can increase selling prices (without affecting demand, of course) reducing fixed or variable costs and replacing unprofitable products with profitable one.

Example 1: Beta Manufacturers Ltd. has supplied you the following information in respect of one of its products:

Total fixed costs	18,000
Total variable costs	30,000
Total sales	60,000
Units sold	20,000

Find out (a) contribution per unit, (b) break-even point, (c) margin of safety, (d) profit, and (e) volume of sales to earn a profit of Rs.24,000.

Solution:

$$\text{Selling price per unit} = \frac{60{,}000}{20{,}000} = \text{Rs.3}$$

$$\text{Variable cost per unit} = \frac{30{,}000}{20{,}000} = \text{Rs.1.50}$$

(a) Contribution per unit = Selling price per unit – Variable cost per Unit
= Rs.3 – Rs.1.50
= Rs.1.50

(b) Break-even point $= \dfrac{\text{Total Fixed Cost}}{\text{Contribution per unit}}$

$= \dfrac{\text{Rs.18,000}}{\text{Rs.1.50}}$

= 12,000 units

(c) Margin of Safety = Units sold – Break-even point
= 20,000 – 12,000
= 8,000 units (or) Rs.24,000

(d) Profit = (Units sold x Contribution per unit) - Fixed Cost
= (20,000 x Rs.1.50) - Rs.18,000
= Rs.12,000

(e) Volume of Sales to earn a profit of Rs.24,000

$$= \frac{\text{Fixed Cost + Desired Profit}}{\text{Contribution per unit}}$$

$$= \frac{18{,}000 + 24{,}000}{1.50}$$

= 28,000 units

Example 2: Calculate `Margin of Safety' from the following data:

Particulars		Rama & Co.	Bala & Co.
Sales		1,00,000	1,00,000
Cost		80,000	80,000
Fixed – Rama & Co.	30,000		
Bala & Co.	50,000		
Variable – Rama & Co.	50,000		
Bala & Co.	30,000		
Profit		20,000	20,000

Solution:

Particulars	Rama & Co.	Bala & Co.
Actual Sales	1,00,000	1,00,000
Less: Sales at Break-even point	60,000	71,429
Marginal of Safety	40,000	28,571

$$\text{Break-even Sales} = \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$$

$$\text{P/V Ratio} = \frac{\text{Sales – Variable Cost}}{\text{Sales}}$$

Therefore;

P/V Ratio		
	1,00,000	1,00,000
	- 50,000	- 30,000

$$\text{Break-even Sales} = \frac{30{,}000}{50\%} = \text{Rs.}60{,}000 \qquad \frac{50{,}000}{70\%} = \text{Rs.}71{,}429$$

Example 3: From the following particulars, find out the selling price per unit if B.E.P. is to be brought down to 9,000 units.

Variable cost per unit Rs.75
Fixed expenses Rs.2,70,000
Selling price per unit Rs.100

Solution:

Let us assume that the contribution per unit at B.E.P. sales of 9,000 is x.

$$\text{B.E.P.} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$$

Contribution per unit is not known. Therefore,

$$9{,}000 \text{ units} = \frac{2{,}70{,}000}{x}$$

$$9{,}000\,x = 2{,}70{,}000$$

$$x = 30$$

Contribution is Rs.30 per unit, in place of Rs.25. So, the selling price should be Rs.105, i.e. Rs.75 + Rs.30.

Break-even chart

The break-even point can also be shown graphically through the break-even chart. The break-even chart `shows the profitability or otherwise of an undertaking at various levels of activity and as a result indicates the point at which neither profit nor loss is made'. It shows the relationship, through a graph, between cost, volume and profit. The break-even point lies at the point of intersection between the total cost line and the total sales line in the chart. In order to construct the breakeven chart, the following assumptions are made:

Assumptions of Break-even chart

1. Fixed costs will remain constant and do not change with the level of activity.

2. Costs are bifurcated into fixed and variable costs. Variable costs change according to the volume of production.
3. Prices of variable cost factors (wage rates, price of materials, suppliers etc.) will remain unchanged so that variable costs are truly variable.
4. Product specifications and methods of manufacturing and selling will not undergo a change.
5. Operating efficiency will not increase or decrease.
6. Selling price remains the same at different levels of activity.
7. Product mix will remain unchanged.
8. The number of units of sales will coincide with the units produced, and hence, there is no closing or opening stock.

Break-even chart Construction

The following steps are required to be taken while constructing the Break-even chart:

1. Sales volume is plotted on the X-axis. Sales volume can be shown in the form of rupees, units or as a percentage of capacity. A horizontal line is drawn spacing equal distances showing sales at various activity levels.
2. Y axis represents revenues, fixed and variable costs. A vertical line is also spaced in equal parts.
3. Draw the sales line from point O onwards. Cost lines may be drawn in two ways (i) Fixed cost line is drawn parallel to X axis and above it variable cost line is drawn from zero point of fixed cost line. This line is called the Total cost line (Fig.1) (ii) In the second method the variable cost line is drawn from point O and above this, fixed cost line is depicted running parallel to the variable cost line. This line may be called Total cost line. (Fig.2)
4. The point at which the total cost cuts across the sales line is the break-even point and volume at this point is break-even volume.
5. The angle of incidence is the angle between sales and the total cost line. It is formed at the intersection of the sales and the total cost line, indicating the profit earning capacity of a firm. The wider the angle the greater is the profit and vice versa. Usually, the angle of incidence and the margin of safety are considered together to show that a wider angle of incidence coupled with a high margin of safety would indicate the most suitable conditions.

Example 9: From the following information, prepare a break-even chart showing the break-even point.

Budget output …. 80,000 units

Fixed expenses …. Rs.4,00,000

Selling price per unit ….. Rs.20

Variable cost per unit …. Rs.10

Solution:

Total costs and sales at varying levels of output:

Output (units)	Variable Cost	Fixed Cost	Total Cost	Sales
	Rs.	Rs.	Rs.	Rs.
	@ 10 P.U.			@ 20 P.U.
20,000	2,00,000	4,00,000	6,00,000	4,00,000
40,000	4,00,000	4,00,000	8,00,000	8,00,000
60,000	6,00,000	4,00,000	10,00,000	12,00,000
80,000	8,00,000	4,00,000	12,00,000	16,00,000

Fig. 1

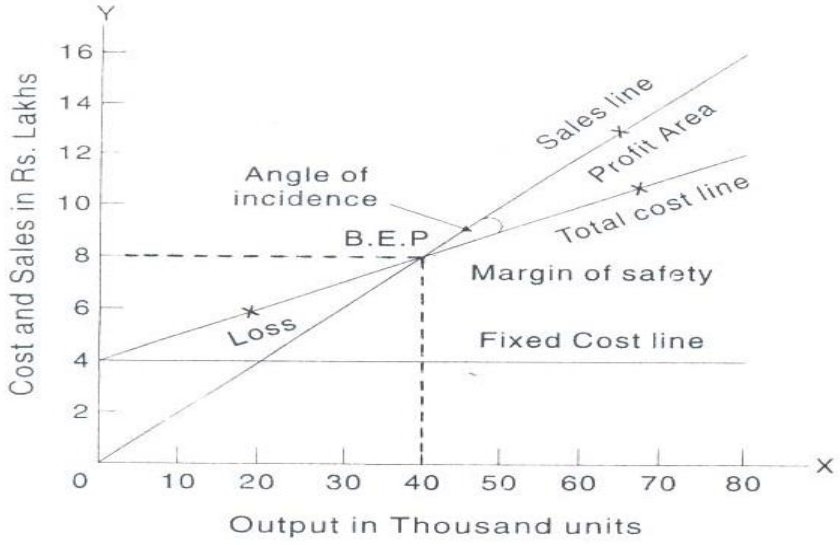
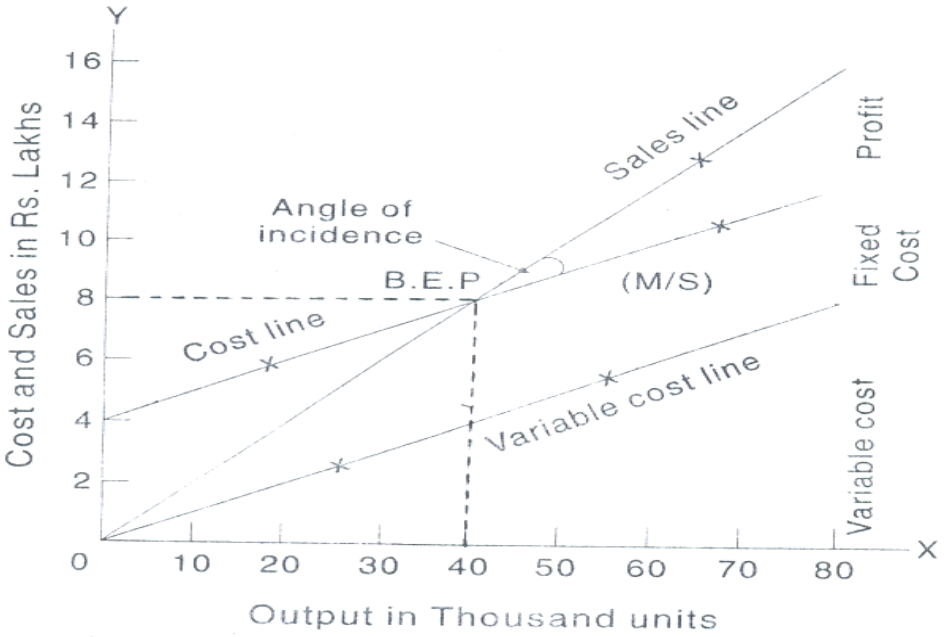


Fig. 2



First Method (Fig.1)

Fixed cost line runs parallel to X-axis. Total cost line is drawn at Rs.4 lakhs on Y-axis and runs upward. Sales line drawn from point O.

B.E.P. is at 40,000 units, i.e., Rs.8,00,000

M/S = Sales – B.E. Volume

= 80,000 – 40,000

= 40,000 Units (i.e. Rs.8,00,000)

Alternative Method (Fig.2)

Variable cost line starts from point O and runs upward. Total cost line is drawn parallel to V.C. line from Rs.4 lakhs point on Y-axis. Total cost and sales line cut each other at 40,000 units (i.e., Rs.8,00,000 sales). This is the Break-even point.

Cash Break-Even Chart

This chart is prepared to show the cash need of a concern. Fixed expenses are to be classified as those involving cash payments and those not involving cash payments like depreciation. As the cash break-even chart is designed to include only actual payments and not expenses incurred, any

time lag in the payment of items included under variable costs must be taken into account. Equal care must be shown on the period of credit allowed to the debtors for the purpose of calculating the amount of cash to be received from them, during a particular period.

Example 10: The following information is available in respect of Graphics Ltd., Ghaziabad, for the budget period.

Sales 10,000 units at Rs.10 per unit.

Variable costs Rs.4 per unit.

Fixed costs Rs.25,000 including depreciation of Rs.5,000

Preference Dividend to be paid Rs.5,000

Taxes to be paid Rs.5,000

It may be assumed that there are no lags in payment. Prepare a cash break-even chart.

Profit volume Graph

This graph (called profit graph) gives a pictorial representation of cost-volume profit relationship. In this graph X axis represents sales. However, the sales line bisects the graph horizontally to form two areas. The ordinate above the zero sales line, shows the profit area, and the ordinate below the zero sales line indicates the loss or the fixed cost area. The profit-volume-ratio line is drawn from the fixed cost point through the break-even point to the point of maximum profit. In order to construct this graph, therefore, data on profit at a given level of activity, the break-even point and the fixed costs are required.

Example 11: Draw the profit volume graph and find out P/V ratio with the following information:

Output 3,000 units
Volume of sales Rs.7,500
Variable cost Rs.1,500
Fixed cost Rs.1,500

Solution:

In the above graph, the profit is Rs.1,500. The fixed cost is Rs.1,500. PQ represents sales line at point Positive, which is the break even point i.e., Rs.3,750. The P/V ratio can easily be found out with the help of this graph as follows:

$$\text{Sales at B.E.P.} = \frac{F \times S}{S - V} = \frac{1{,}500 \times 7{,}500}{7{,}500 - 4{,}500} \text{ Rs.3,750}$$

$$\text{Margin of safety} = 7{,}500 - 3{,}750 = 3{,}750$$

$$\text{P/V Ratio} = \frac{S - V}{S} = \frac{7{,}500 - 4{,}500}{7{,}500}$$

$$= \frac{2}{5} \text{ or } 0.4 \text{ or } 40\%$$

Benefits of Marginal Costing

The technique of marginal costing is of immense use to the management in taking various decisions, as explained below:

1. **To decide about the quantum of good to be produced** Marginal costing helps in finding out the level of output which is most profitable for running a concern. This, in turn, helps in utilising plant capacity in full, and realise maximum profits. By determining the most profitable relationships between cost, price and volume, marginal costing helps a business determine most competitive prices for its products.

2. **The goods to be produced** By applying marginal costing techniques, the most suitable production line could be determined. The profitability of various products can be compared and those products which languish behind and which do not seem to be feasible (in view of their inability to recover marginal costs), may be eliminated from the production line by using marginal costing. It, thus, helps in selecting an optimum mix of products, keeping the capacity and resource constraints in mind. It will also serve as a guide in arriving at the price for new products.

3. **To decide on make or produce** The marginal cost of producing an article inside the factory serves as a useful guide while arriving at make or buy decisions. The costs of manufacturing can be compared with the costs of buying outside and a suitable decision can be arrived at easily.

4. **To decide about method of production** In case a particular product can be produced by two or more methods, ascertaining the marginal cost of producing the product by each method will help in deciding as to which method should be allowed. The same is true in case of decisions to use machine power in place of manual labour.

5. **When to produce?** In periods of trade depression, marginal costing helps in deciding whether production in the plants should be suspended temporarily or continued in spite of low demand for the firm's products.

6. **At what cost to produce?** Marginal costing helps in determining the no profit- no-loss point. The efficiency and economy of various products, plants, departments can also be determined. This helps in profit planning as well as cost control.

Application of Cost-Volume Anaysis

Cost-volume-profit (CVP) analysis focuses on the way cost and profit change when volume changes. It is, broadly speaking, that system of analysis which determines the probable profit at any level of activity. This technique is generally used to analyse the incremental effect of volume on costs, revenues and profits. At what volume of operations are costs and revenues equal? What volume of output or sales would be necessary to earn a profit of say Rs.2 lakhs? How much profit will be earned at a volume of, say 10,000 units? What will happen if there is a reduction of 10 percent in the selling price? Questions like these are sought to be answered through CVP analysis. This detailed analysis will help the management to know the profit levels at different activity levels of production and sales and various types of costs involved in it.

- forecasting the profit in an accurate manner
- preparing the flexible budgets at different levels of activity
- fixing prices for products

Marginal costing technique helps management in several ways. These are discussed below:

1. Profit Planning

There are four important ways of improving the profit performance of a business: (i) increasing the volume, (ii) increasing the selling price, (iii)

decreasing variable cost, and (iv) decreasing fixed costs. Profit planning is the planning of future operations so as to attain maximum profit. The contribution ratio shows the relative profitability of various sectors of business whenever there is a change in the selling price, variable cost etc.

Example 4: Two businesses, P Ltd. and Q Ltd. sell the same type of product in the same type of market. Their budgeted profit and loss accounts for the coming year are as under:

	P Ltd.		Q Ltd.	
Sales		1,50,000		1,50,000
Less: Variable costs	1,20,000		1,00,000	
Fixed costs	15,000	1,35,000	35,000	1,35,000
		---		---
Budget Net Profit		15,000		15,000
		---		---

You are required to:

i) Calculate the break-even point for each business

ii) Calculate the sales volume at which each business will earn Rs.5,000 profit.

iii) State which business is likely to earn greater profit in conditions of:

(a) heavy demand for the product

(b) low demand for the product, and, briefly give your argument also.

Solution:

(i) For calculating the break-even points, P/V ratio of P Ltd. and Q Ltd., should be calculated:

$$\text{P/V Ratio} = \frac{\text{Contribution / Sales}}{\text{Sales}} = \frac{\text{Fixed Expenses + Profit}}{\text{Sales}}$$

$$\text{P/V Ratio of P} = \frac{15{,}000 + 15{,}000}{1{,}50{,}000} = \frac{1}{5} = 20\%$$

$$\text{P/V Ratio of Q} = \frac{35{,}000 + 15{,}000}{1{,}50{,}000} = \frac{1}{3}$$

$$= 33\ 1/3\%$$

$$\text{Break-even point} = \frac{\text{Fixed expenses}}{\text{P/V Ratio}}$$

$$\text{P Ltd.} = \frac{15{,}000}{1/5} = \text{Rs.}75{,}000$$

$$\text{Q Ltd.} = \frac{35{,}000}{1/3} = \text{Rs.}1{,}05{,}000$$

(ii) Sales volume to earn a desired profit (Rs.5000):

$$\text{Formula} = \frac{\text{Fixed Expenses + Desired Profit}}{\text{P/V Ratio}}$$

$$\text{P Ltd.} = \frac{15{,}000 + 5{,}000}{1/5} = \text{Rs.}1{,}00{,}000$$

$$\text{Q Ltd.} = \frac{35{,}000 + 5{,}000}{} = \text{Rs.}1{,}20{,}000$$

(iii) (a) In conditions of heavy demand, a concern with larger P/V ratio can earn greater profits because of greater contribution. Thus, Q Ltd. is likely to earn greater profit.

(b) In conditions of low demand, a concern with lower break-even point is likely to earn more profits because it will start earning profits at a lower level of sales. In this case, P Ltd. will start earning profits when its sales reach a level of Rs.75,000, whereas Q Ltd. will start earning profits when its sales reach Rs.1,05,000. Therefore, in case of low demand, break-even point should be reached as early as possible so that the concern may start earning profits.

Illustration 1: (Profit Planning) Based on the following information, find out the breakeven point, the sales needed for a profit of Rs.6,00,000 and the profit if 4,00,000 units are sold at Rs.6 per unit.

Units of output	5,00,000
Fixed costs	Rs.7,50,000
Variable cost per unit	Rs. 2
Selling price per unit	Rs. 5

Solution:

(1) Break-even point (of sales)

$$= \frac{\text{Fixed costs}}{\text{Contribution per unit}} \times \text{Selling price per unit}$$

$$= \frac{7{,}50{,}000}{3} \times 5 = \text{Rs.}12{,}50{,}000$$

(2) Sales needed for a profit of Rs.6,00,000

$$\text{Sales} = \frac{\text{FC + Desired Profit}}{\text{P/V Ratio}}$$

$$= \frac{7{,}50{,}000 + 6{,}00{,}000}{3/5}$$

$$= 13{,}50{,}000 \times \frac{5}{3}$$

$$= \text{Rs.}22{,}50{,}000 \text{ [or]}$$

$$= \frac{22,50,000}{(SP)\ 5}$$

= 4,50,000 units

(3) Profit on sale of 4,00,000 units at Rs.6 per unit

Sales = 4,00,000 units

= 4,00,000 x Rs.6

= Rs.24,00,000

Sales – V. Cost = Contribution

24 lakhs – (4 lakhs x 2 per unit) = 16,00,000

C – FC = Profit

16,00,000 – 7,50,000 = Rs.8,50,000 [or]

Unit sales x Contribution per unit – FC

4 lakhs x Rs.4 = 16 lakhs – 7,50,000 = 8,50,000

2. Introduction of a New Product

Sometimes, a product may be added to the existing lines of products with a view to utilise idle facilities, to capture a new market or for any other purpose. The profitability of this new product has to be found out initially. Usually, the new product will be manufactured if it is capable of contributing something toward fixed costs and profit after meeting its variable costs.

Example 5: A concern manufacturing Product X has provided the following information:

	Rs.
Sales	75,000
Direct materials	30,000
Direct labour	10,000
Variable overhead	10,000
Fixed overhead	15,000

In order to increase its sales by Rs.25,000, the concern wants to introduce the Product Y, and estimates the costs in connection therewith as under:

Direct materials	10,000
Direct labour	8,000
Variable overhead	5,000
Fixed overhead	NIL

Advise whether the Product Y will be profitable or not.

Solution:

Marginal Cost Statement

(in Rupees)

	X	Y	Total
Sales	75,000	25,000	1,00,000
Less: Marginal costs:			
Direct materials	30,000	10,000	40,000
Direct labour	10,000	8,000	18,000
Variable overhead	10,000	5,000	15,000
	50,000	23,000	73,000
Contribution	25,000	2,000	27,000
Fixed cost			15,000
Profit			12,000

Commentary: If product Y is introduced, the profitability of product X is not affected in any manner. On the other hand, product Y provides a contribution of Rs.2,000 towards fixed cost and profit. Therefore, Y should be introduced.

3. Level of Activity Planning

Marginal costing is of great help while planning the level of activity. Maximum contribution at a particular level of activity will show the position of maximum profitability.

Example 6: Following is the cost structure of Sundaram Corporation, Pondicherry, manufacturers of Colour TVs.

	Level of Activity		
	50%	70%	90%
Output (in units)	200	280	360
Cost (in Rs.)			
Materials	10,00,000	14,00,000	18,00,000
Labour	3,00,000	4,20,000	5,40,000
Factory overhead	5,00,000	6,00,000	7,00,000
Factory Cost	18,00,000	24,20,000	30,40,000

In view of the fact that there will be no increase in fixed costs and import license for the picture tubes required in the manufacture of its TVs has been obtained, the Corporation is considering an increase in production to its full installed capacity.

The management requires a statement showing all details of production costs at 100% level of activity.

Solution:

Marginal Cost Statement

(At 100% level of activity with 400 units)	Total Cost Rs.	Cost per unit Rs.
Materials	20,00,000	5,000
Labour	6,00,000	1,500
Variable Factory Overhead	5,00,000	1,250
	---	---
Marginal Factory Cost	31,00,000	7,750
Fixed Factory Overhead	2,50,000	625
	---	---
Total Factory Cost	33,50,000	8,375
	---	---

Thus, the marginal factory cost per unit is Rs.7,750 and the total production cost per unit is Rs.8,375.

Commentary:

(i) Calculation of Variable Factory Overheads per unit:

$$= \frac{\text{Rs.6,00,000} - \text{Rs.5,00,000}}{\text{80 units}} = \text{Rs.1,250}$$

(ii) Calculation of Fixed Factory Overheads:

Factory overheads – (No. of units at certain level of activity x Variable Factory Overheads per unit).

Therefore Rs.5,00,000 – (200 units x 1,250)

Therefore Rs.5,00,000 – Rs.2,50,000 = Rs.2,50,000

The amount can be verified by making calculation at any other level of activity.

(iii) Variable Factory Overheads at 100% level of activity:

400 units x 1,250 = Rs.5,00,000

4. Key Factor

A concern would produce and sell only those products which offer maximum profit. This is based on the assumption that it is possible to produce any quantity without any difficulty and sell likewise. However, in actual practice, this seems to be unrealistic as several constraints come in the way of manufacturing as well as selling. Such constraints that come in the way of management's efforts to produce and sell in unlimited quantities are called `key factors' or

`limiting factors'. The limiting factors may be materials, labour, plant capacity, or demand. Management must ascertain the extent of the influence of the key factor for ensuring maximisation of profit. Normally, when contribution and key factors are known, the relative profitability of different products or processes can be measured with the help of the following formula:

$$\text{Profitability} = \frac{\text{Contribution}}{\text{Key Factor}}$$

Example 7: From the following data, which product would you recommend to be manufactured in a factory, time, being the key factor?

	Per unit of Product X	Per unit of Product Y
Direct Material	24	14
Direct labour at Re.1 per hour	2	3
Variable overhead at Rs.2 per hour	4	6
Selling price	100	110
Standard time to produce	2 hours	3 hours

Solution:

		Per unit of Product X		Per unit of Product Y
Selling price		100		110
Less: Marginal Cost:				
Direct materials		24		14
Direct labour		2		3
Variable overhead	4	30	6	23
Contribution		70		87
Standard time to produce		2 hours		3 hours
Contribution per hour		70/2 = Rs.35		87/3 = Rs.29

Contribution per hour of Product X is more than that of Product Y by Rs.6. Therefore, Product X is more profitable and is recommended to be manufactured.

5. Make or Buy Decisions

A company might be having unused capacity which may be utilized for making component parts or similar items instead of buying them from the market. In arriving at such a `make or buy'

decision, the cost of manufacturing component parts should be compared with price quoted in the market. If the variable costs are lower than the purchase price, the component parts should be manufactured in the factory itself. Fixed costs are excluded on the assumption that they have been already incurred, and the manufacturing of components involves only variable cost. However, if there is an increase in fixed costs and any limiting factor is operating while producing components etc. that should also be taken into account. Consider the following illustration, throwing light on these aspects.

Example 8: You are the Management Accountant of XYZ Co. Ltd. The
Managing Director of the company seeks your advice on the following problem: The company produces a variety of products each having a number of computer parts. Product "B" takes 5 hours to produce on machine No.99 working at full capacity. "B" has a selling price of Rs.50 and a marginal cost, Rs.30 per unit. "A-10" a component part could be made on the same machine in 2 hours for marginal cost of Rs.5 per unit. The supplier's price is Rs.12.50 per unit. Should the company make or buy "A-10"?

Assume that machine hour is the limiting factor.

Solution:

In this problem the cost of new product plus contribution lost during the time for manufacturing "A-10" should be compared with the supplier's price to arrive at a decision.

	Rs.
"B" – Selling price	50.00
Marginal cost	30.00

	20.00

It takes 5 hours to produce one unit of "B".

Therefore, Contribution earned per hour on Machine No.99 is Rs.20/5 = Rs.4. "A-10" takes two hours to be manufactured on machine which is producing "B". Real cost of "A-10" to the company = Marginal cost of "A-10" plus contribution lost for using the machine for "A-10".

Rs.5 + Rs.8 = Rs.13

This is more than the seller's price of Rs.12.50 and so it is advisable for the company to buy the product from outside.

Example 9: A T.V. manufacturing company finds that while it costs Rs.6.25 to make each component X, the same is available in the market at Rs.4.85 each, with an assurance of continued supply. The break down of cost is:

	Rs.	
Materials	2.75	Each
Labour	1.75	Each
Other variables	0.50	Each
Depreciation and other fixed costs	1.25	Each
	6.25	

Should you make or buy?

Solution:

Variable cost of manufacturing is Rs.5; (Rs.6.25 – Rs.1.25) but the market price is Rs.4.85. If the fixed cost of Rs.1.25 is also added, it is not profitable to make the component. Because there is a saving of Rs.0.15 even in variable cost, it is profitable to procure from outside.

6. Suitable Product Mix/Sales Mix

Normally, a business concern will select the product mix which gives the maximum profit. Product mix is the ratio in which various products are produced and sold. The marginal costing technique helps management in taking appropriate decisions regarding the product mix, i.e., in changing the ratio of product mix so as to maximise profits. The technique not only helps in dropping unprofitable products from the mix but also helps in dropping unprofitable departments, activities etc. Consider the following illustrations:

Example 10: (Product Mix)

The following figures are obtained from the accounts of a departmental store having four departments.

Departments

(figures in Rs.)

Particulars	A	B	C	D	Total
Sales	5,000	8,000	6,000	7,000	26,000
Marginal cost	5,500	6,000	2,000	2,000	15,500
Fixed cost (apportioned)	500	4,000	1,000	1,000	6,500
Total cost	6,000	10,000	3,000	3,000	22,000
Profit/Loss(-)	1,000 (-)	2,000	3,000	4,000	4,000

On the above basis, it is decided to close down Dept. B immediately, as the loss shown is the maximum. After that Dept. A will be discarded. What is your advice to the management?

Statement of Comparative Profitability

Departments

Particulars	A	B	C	D	Total
Sales	5,000	8,000	6,000	7,000	26,000
Less:					
Marginal cost	5,500	6,000	2,000	2,000	15,500
Contribution (-)	500	2,000	4,000	5,000	10,500
Fixed cost					6,500
Profit					4,000

Commentary: From the above, it is clear that the contribution of Dept. A is negative and should be discarded immediately. As Dept. B provides Rs.2,000 towards fixed costs and profits, it should not be discarded.

Example 11 (Sales Mix):

Present the following information to show to the management: (a) the marginal product cost and the contribution per unit; (b) the total contribution and profits resulting from each of the following mixtures:

	Product	Per Unit (Rs.)
Direct Materials	A	10
	B	9
Direct wages	A	3
	B	2

Fixed expenses Rs.800

Variable expenses are allocated to products as 100% of direct wages.

		Rs.
Sales price	A	20
	B	15

Sales mixtures:

(i) 1000 units of product A and 2000 units of B
(ii) 1500 units of product A and 1500 units of B
(iii) 2000 units of product A and 1000 units of B

Solution:

(a) Marginal cost statement	A		B	
Direct materials		10		9
Direct wages	3		2	
Variable overheads (100%)	3		2	
		---		---
Marginal cost	16		13	
Sales price		20		15
		---		---
Contribution		4		2

(b) Sales mix choice	1000 A+ 2000 B (i)	1500 A+ 1500 B (ii)	2000 A+ 1000B (iii)
	(Rs.)	(Rs.)	(Rs.)
Total sales	(1000 x 20 + 2000 x 15) = 50,000	(1500 x 20 + 1500 x 15) = 52,500	(2000 x 20 + 1000 x 15) = 55,000
Less: Marginal cost	(1000 x 16 + 2000 x 13) = 42,000	(1500 x 16 + 1500 x 13) = 43,500	(2000 x 16 + 1000 x 13) = 45,000
Contribution	8,000	9,000	10,000
Less: Fixed costs	800	800	800
Profit	7,200	8,200	9,200

Therefore sales mixture (iii) will give the highest profit; and as such, mixture (iii) can be adopted.

7. Pricing Decisions

Marginal costing techniques help a firm to decide about the prices of various products in a fairly easy manner. Let's examine the following cases:

(i) Fixation of selling price

Example 12: P/V ratio is 60% and the marginal cost of the product is Rs.50. What will be the selling price?

Solution:

$$\text{P/V ratio} = \frac{\mathbf{S - V}}{S} = 1 - \frac{\mathbf{V}}{S} = \frac{\mathbf{C}}{S}$$

$$\frac{\text{Variable cost}}{\text{Sales}} = 40\% \text{ or } \frac{40}{100}$$

$$\text{Selling price} = \frac{50}{40\%} = \frac{50 \times 100}{40} = \text{Rs.}125$$

(ii) Reducing Selling Price

Example 13: The price structure of a cycle made by the Visu Cycle Co. Ltd. is as follows:

	Per Cycle
Materials	60
Labour	20
Variable overheads	20

Fixed overheads	100
Profit	50
Selling price	50

	200

This is based on the manufacture of one lakh cycles per annum. The company expects that due to competition they will have to reduce selling prices, but they want to keep the total profits intact. What level of production will have to be reached, i.e., how many cycles will have to be made to get the same amount of profits, if:

(a) the selling price is reduced by 10%?
(b) the selling price is reduced by 20%?

Solution:

		(Rs.)	(Rs.)
Existing profit	=	1,00,000 x 50 =	50,00,000
Total fixed overheads	=	1,00,000 x 50 =	50,00,000

(a) Selling price is reduced by 10% and to get the existing profit of Rs.50 lakhs.

New selling price = 200 – 10% of Rs.200
= 200 – 20 =Rs.180
New contribution = 180 – 100 =Rs.80 per unit
Total sales (units) = F + P/Contribution per unit

$$= \frac{5,00,000 + 5,00,000}{80}$$

= 1,25,000 cycles

are to be obtained and sold to earn the existing profit of Rs.5,00,000.

(b) Selling price reduced by 20% and to get the existing profit of Rs.5,00,000.

New selling price = 200 – 20% of Rs.200
= 200 – 40 = Rs.160
New contribution = S – V
= 160 – 100 = Rs.80 per unit
Total sales (units) = F + P/Contribution per unit

$$= \frac{5,00,000 + 5,00,000}{60}$$

= 1,66,667 cycles are to be produced and sold to earn the existing profit of Rs.50 lakhs.

(iii) Pricing during Recession:

Example 14: SSA Company is working well below normal capacity due to recession. The directors of the company have been approached with an enquiry for special job. The costing department estimated the following in respect of the job.

Direct materials	Rs.10,000
Direct labour 500 hours @	Rs.2 per hour
Overhead costs: Normal recovery rates	
Variable	Re.0.50 per hour
Fixed	Re.1.00 per hour

The directors ask you to advise them on the minimum price to be charged. Assume that there are no production difficulties regarding the job.

Solution:

Calculation of Marginal cost:

	(Rs.)
Direct materials	10,000
Direct labour	1,000
Variable overhead @ Re.0.50 per hour	250

Marginal cost	11,250

Commentary: Here the minimum price to be quoted is Rs.11,250 which is the marginal cost. By quoting so, the company is sacrificing the recovery of the profit and the fixed-costs. The fixed costs will continue to be incurred even if the company does not accept the offer. So any price above Rs.11,250 is welcome.

1. **Accepting Foreign Order**

Marginal costing technique can also be used to take a decision as to whether to accept a foreign offer or not. The speciality of this situation is that normally foreign order is requiring the manufacturer to supply the product at a price lower than the inland selling price. Here the decision

is taken by comparing the marginal cost of the product with the foreign price offered. If the foreign order offers a price higher than the marginal cost then the offer can be accepted subject to availability of sufficient installed production capacity. The following illustration highlights this decision:

Example 15: Due to industrial depression, a plant is running at present at 50% of the capacity. The following details are available:

Cost of Production per unit	(Rs.)
Direct materials	**2**
Direct labour	1
Variable overhead	3
Fixed overhead	2

	8

Production per month	20,000 units
Total cost of production	Rs.1,60,000
Sale price	Rs.1,40,000

Loss	Rs. 20,000

An exporter offers to buy 5000 units per month at the rate of Rs.6.50 per unit and the company is hesitant to accept the order for fear of increasing its already large operating losses. Advise whether the company should accept or decline this offer.

Solution:

At present the selling price per unit is Rs.7/- and the marginal cost per unit is Rs.6/- (Material Rs.2 + Labour Re.1 + Variable overhead Rs.3). The foreign order offers a price of Rs.6.50 and there is ample production capacity (50%) available. Since the foreign offer is at a price higher than marginal cost the offer can be accepted. This is proved hereunder:

				(Rs.)
Marginal cost of 5000 units	=	5000 x 6	=	30,000
Sale price of 5000 units	=	5000 x 6.50	=	32,500

Profit	2,500

Thus by accepting the foreign order the present loss of Rs.20,000 would be reduced to Rs.17,500 i.e., Rs.20000 loss – Rs.2,500 profit.

Illustration 2: (Pricing) A company is considering a reduction in the price of its product by 10% because it is felt that such a step may lead to a greater volume of sales. It is anticipated that there will be no change in total fixed costs or variable costs per unit. The directors wish to maintain profit at the present level.

You are given the following information:

Sales (15,000 units)	Rs.3,00,000
Variable cost	Rs.13 per unit
Fixed cost	Rs.60,000

From the above information, calculate P/V ratio and the amount of sales required to maintain profit at the present level after reduction of selling price by 10%.

Solution:

$$\text{P/V Ratio} = \frac{S - V}{S} = \frac{3,00,000 - (15,000 \times 13)}{3,00,000}$$

$$= 0.35 \text{ or } 35\%$$

After reduction of price by 10% it will be Rs.18 (original price per unit Rs.20).

Present profit level = (35% of 3,00,000) – 60,000

= Rs.45,000

P/V ratio after price reduction

$$= \frac{S - V}{S} = \frac{18 - 13}{18} = \frac{5}{18} \%$$

To earn the same profit level

$$= \frac{F + \text{Desired Profit}}{\text{P/V Ratio}}$$

$$= \quad 1,05,000 \times \frac{18}{5}$$

$$= \quad Rs.3,78,000$$

Limitations of Marginal costing:

1.Difficulty in Classification: In marginal costing, costs are segregated into fixed and variable. In actual practice, this classification scheme proves to be superfluous in that, certain costs may be partly fixed and partly variable and certain other costs may have no relation to volume of output or even with the time. In short, the categorisation of costs into fixed and variable elements is a difficult and tedious job.

2.Difficulty in Application: The marginal costing technique cannot be applied in industries where large stocks in the form of work-in-progress (job and contracting firms) are maintained.

3.Defective Inventory Valuation: Under marginal costing, fixed costs are not included in the value of finished goods and work in progress. As fixed costs are also incurred, these should form part of the cost of the product. By eliminating fixed costs from finished stock and work-in-progress, marginal costing techniques present stocks at less than their true value. Valuing stocks at marginal cost is objectionable because of other reasons also:

1. In case of loss by fire, full loss cannot be recovered from the insurance company.
2. Profits will be lower than that shown under absorption costing and hence may be objected to by tax authorities.
3. Circulating assets will be understated in the balance sheet.

4.Wrong Basis for Pricing: In marginal costing, sales prices are arrived at on the basis of contribution alone. This is an objectionable practice. For example, in the long run, the selling price should not be fixed on the basis of contribution alone as it may result in losses or low profits. Other important factors such as fixed costs, capital employed should also be taken into account while fixing selling prices. Further, it is also not correct to lay more stress on selling function, as is done in marginal costing, and relegate production function to the background.

5.Limited Scope: The utility of marginal costing is limited to short-run profit planning and decision-making. For decisions of far-reaching importance, one is interested in special purpose cost rather than variable cost. Important decisions on several occasions, depend on non-cost considerations also, which are thoroughly discounted in marginal costing.

In view of these limitations, marginal costing needs to be applied with necessary care and caution. Fruitful results will emerge only when management tries to apply the technique in combination with other useful techniques such as budgetary control and standard costing.

Worked out Problems on Marginal Costing

Example 16: From the following information, find out the amount of profit earned during the year, using marginal cost equation:

Fixed cost	**Rs.5,00,000**
Variable cost	Rs.10 per unit
Selling price	Rs.15 per unit
Output level	1,50,000 units

Solution:

Contribution	=	Selling price – Variable cost
	=	(1,50,000 x 15) – (1,50,000 x 10)
	=	Rs.22,50,000 – Rs.15,00,000
	=	Rs.7,50,000
Contribution	=	Fixed cost + Profit
Rs.7,50,000	=	5,00,000 + Profit
Profit	=	7,50,000 – 5,00,000
	=	(C – F)
Profit	=	Rs.2,50,000

Example 17: Determine the amount of fixed costs from the following details, using the marginal cost equation.

Sales	Rs.2,40,000
Direct materials	Rs. 80,000
Direct labour	Rs. 50,000
Variable overheads	Rs. 20,000
Profit	Rs. 50,000

Solution:

Marginal costing equation	=	S – V = F + P
	=	2,40,000 – 1,50,000
	=	F + P
	=	90,000
	=	F + 50,000

F = 90,000 – 50,000
F = Rs.40,000

Example 18:

Sales 10,000 units @ Rs.25 per unit

Variable cost Rs.15 per unit

Fixed costs Rs.1,00,000

Find out the sales for earning a profit of Rs.50,000

Solution:

Sales to earn a profit of Rs.50,000

$$= \frac{\text{(Fixed cost + Profit) Sales}}{\text{Sales – Variable Cost}}$$

$$= \frac{1{,}00{,}000 + 50{,}000 \times 2{,}50{,}000}{2{,}50{,}000 - 1{,}50{,}000}$$

$$= \frac{1{,}50{,}000 \times 2{,}50{,}000}{1{,}00{,}000}$$

= Rs.3,75,000

Example 19: The records of RAM Ltd., which has three departments give the following figures:

	Dept. A (Rs.)	Dept. B (Rs.)	Dept. C (Rs.)	Total (Rs.)
Sales	12,000	18,000	20,000	50,000
Marginal cost	13,000	6,000	15,000	34,000
Fixed cost	1,000	4,000	10,000	15,000
Total cost	14,000	10,000	25,000	49,000
Profit/Loss	-2,000	+8,000	-5,000	1,000

The management wants to discontinue product C immediately as it gives the maximum loss. How would you advise the management?

Solution:

Marginal Cost Statement

Particulars	A (Rs.)	B (Rs.)	C (Rs.)	Total (Rs.)
Sales	12,000	18,000	20,000	50,000
Less: Marginal cost	13,000	6,000	15,000	34,000

Contribution	-1,000	12,000	5,000	16,000
Fixed cost				15,000
Profit				1,000

Here department A gives negative contribution, and as such it can be given up. Department C gives a contribution of Rs.5,000. If department C is closed, then it may lead to further loss. Therefore, C should be continued.

Example 20: From the following data, calculate the break-even point.

	First year	Second year
Sales	80,000	90,000
Profit	Rs.10,000	Rs.14,000

Solution:

$$\text{BEP Sales} = \frac{\text{Fixed costs}}{\text{P/V Ratio}}$$

$$\text{P/V Ratio} = \frac{\text{Change in profit}}{\text{Change in sales}} \times 100$$

$$= \frac{4{,}000}{10{,}000} \times 100 = 40\%$$

$$\text{Fixed cost} = \text{Contribution} - \text{Profit}$$

$$= 80{,}000 \times \frac{40}{100} - \text{Rs.}10{,}000$$

$$= 32{,}000 - 10{,}000$$

$$= 22{,}000$$

$$\text{BEP Sales} = \frac{22{,}000 \times 100}{40} = \text{Rs.}55{,}000$$

Example 21: A company is considering expansion. Fixed costs amount to Rs.4,20,000 and are expected to increase by Rs.1,25,000 when plant expansion is completed. The present plant capacity is 80,000 units a year. Capacity will increase by 50 percent with the expansion. Variable costs are currently Rs.6.80 per unit and are expected to go down by Re.0.40 per unit with the expansion. The current selling price is Rs.16 per unit and is expected to remain the same under either alternative. What are the break-even points under either alternatives? Which alternative is better and why?

Solution:

Computation of BEP under two alternatives

Items	Currently Rs.	After the expansion Rs.
Fixed costs	4,20,000	5,45,000
Capacity	80,000 units	1,20,000 units
Variable cost per unit	6.80	6.40
Contribution margin per unit	9.20	9.60
Selling price per unit	16	16

$$BEP = \frac{4,20,000}{9.20} = 45,652 \text{ units} \qquad \frac{5,45,000}{9.60} = 56,771 \text{ units}$$

Assuming that the whole production can be sold, the profit under the two alternatives will be:

Items	Currently	After the expansion
Sales	12,80,000	19,20,000
- Variable cost	5,44,000	7,68,000
Contribution	7,36,000	11,52,000
- Fixed cost	4,20,000	5,45,000
	3,16,000	6,07,000

It is obvious from the above calculations that the profits will be almost double after the expansion. Hence, the alternative of expansion is to be preferred.

Example 22 A factory engaged in manufacturing plastic buckets is working at 40% capacity and produces 10,000 buckets per annum: **Rs.**

Material	10
Labour cost	3
Overheads	5 (60% fixed)

The selling price is Rs.20 per bucket.

If it is decided to work the factory at 50% capacity, the selling price falls by 3%. At 90% capacity the selling price falls by 5%, accompanied by a similar fall in the prices of material.

You are required to calculate the profit at 50% and 90% capacities and also the break-even points for the same capacity productions.

Solution:

Statement showing profit and break-even point at different capacity levels:

	Capacity level	50%		90%	
	Production (units)	12,500		22,500	
		Per unit Rs.	Total Rs.	Per unit Rs.	Total Rs.
(a)	Sales	19.40	2,42,500	19.00	4,27,500
	Variable cost				
	Materials	10.00	1,25,000	9.50	2,13,750
	Wages	3.00	37,500	3.00	67,500
	Variable overhead	2.00	25,000	2.00	45,000
(b)	Total variable cost	15.00	1,87,500	14.50	3,26,250
(c)	Contribution (S-V) or (a – b)	4.40	55,000	4.50	1,01,250
	Less Fixed cost		30,000		30,000
			25,000		71,250

$$\text{Units} = \frac{\text{Fixed costs}}{\text{Contribution per unit}}$$

$$= \frac{30{,}000}{4.40} = 6818 \qquad \frac{30{,}000}{4.50} = 6667$$

Sales value = Rs.1,32,269 = Rs.1,26,667

Example 22:

Calculate:

(i) The amount of fixed expenses

(ii) The number of units to break-even

(iii) The number of units to earn a profit of Rs.40,000

The selling price can be assumed as Rs.10.

The company sold in two successive periods 9,000 units and 7,000 units and has incurred a loss of Rs.10,000 and earned Rs.10,000 as profit respectively.

Solution:

Year	Sales	Profit/Loss
I	7,000 units	Rs. (-)10,000
II	9,000 units	Rs.(+)10,000
	---	---
	2,000	20,000 (Change)
	---	---

	Year I	Year II
(i) Contribution	= 9,000Units x Rs.10	7,000units xRs.10
	= Rs. 90,000	= Rs. 70,000
Less: Profit/Loss	= Rs. -10,000	= Rs.+10,000
	---	---
Fixed Cost	= Rs. 80,000	= Rs. 80,000

(Contribution = Fixed cost + Profit)

(ii) Contribution $= \frac{\text{Rs.20,000}}{\text{2,000 units}} = \text{Rs.10 per unit}$

BEP $= \frac{FC}{C} = \frac{\text{Rs.80,000}}{\text{Rs.10}} = \text{8,000 units}$

(iii) The No. of units to earn a profit of Rs.40,000

$$= \frac{F + \text{Desired Profit}}{\text{C per unit}}$$

$$= \frac{80{,}000 + 40{,}000}{10} = \text{12,000 units}$$

Example 23:

From the following data calculate:

(i) P/V ratio

(ii) Profit when sales are Rs.20,000

(iii) Net break-even if selling price is reduced by 20%

Fixed expenses Rs.4,000

Break-even point 10,000

Solution:

$$\text{(i) Break-even Sales} = \frac{\text{Fixed expenses}}{\text{P/V ratio}}$$

$$\text{or P/V ratio} = \frac{\text{Fixed expenses}}{\text{Break-even sales}}$$

$$= \frac{4{,}000}{10{,}000} = 40\%$$

(ii) Profit when sales are Rs.20,000

Profit = Sales x P/V ratio – Fixed expenses

= Rs.20,000 x 40% − Rs.4,000

= Rs.8,000 – Rs.4,000

= Rs.4,000

(iii) New break-even point if selling price is reduced by 20%

If selling price is Rs.100, now it will be Rs.80

V. cost per unit = Rs.60 (i.e., 100 – 40% old P/V ratio)

$$\text{New P/V ratio} = \frac{80 - 60}{80} = 25\%$$

$$\text{Break-even point} = \frac{4{,}000}{25\%} = \text{Rs.}16{,}000$$

Example 24:

From the following data calculate:

(i) Break-even point in amount of sales in rupees.

(ii) Number of units that must be sold to earn a profit of Rs.60,000 per year.

(iii) How many units must be sold to earn a net profit of 15% of sales?

Sales Price	**Rs.20 per unit**
Variable manufacturing costs	Rs.11 per unit
Variable selling costs	Rs.3 per unit
Fixed factory overheads	Rs.5,40,000
Fixed selling costs	Rs.2,52,000

Solution:

(i)

Items		Per unit Rs.		Total fixed cost Rs.
Sales price		20	Factory overheads	5,40,000
Variable costs			Selling costs	2,52,000

Manufacturing	11			7,92,000
Selling	3	14		
	--	---		
Contribution per unit	6			

$$\text{BEP} = \frac{\text{Fixed costs}}{\text{Contribution per unit}} = \frac{7,92,000}{6}$$

= 1,32,000 units

Total sales = 1,32,000 x Rs.20 = 26,40,000

(ii) $$\frac{\text{Fixed cost + Desired Profit}}{\text{Contribution per unit}} = \frac{7,92,000 + 60,000}{6}$$

$$= \frac{8,52,000}{6}$$

= 1,42,000 units

(iii) Let the no. of units sold be x.

Marginal cost equation:

= S – V	=	F + P
= 20x – 14x	=	F + 15% of sales
= 20 x – 14 x	=	7,92,000 + 15% of 20x
= 6 x	=	7,92,000 + 3 x
= 6 x – 3 x	=	7,92,000
= 3 x	=	7,92,000

$$x = \text{no. of units} = \frac{7,92,000}{3}$$

$$= 2,64,000$$

$$\text{Profit} = \frac{2,64,000 \times Rs.20 \times 15}{100} = Rs.7,92,000$$

Example 25 The cost per unit of the three products X, Y and Z of a concern is as follows:

	X (Rs.)	Y (Rs.)	Z (Rs.)
Direct material	6	7	6
Direct labour	10	8	9
Variable expenses	4	5	3
Fixed expenses	3	3	2
	23	23	20
Profit	9	7	6
Selling price	32	30	26
No. of units produced	10,000	5,000	8,000

Production arrangements are such that if one product is given up, the production of the others can be raised by 50%. The Directors propose that Z should be given up because the contribution in that case is the lowest. Analyse the case and give your opinion.

Solution:

Statement of Projected Profitability with Products X and Y

	X	Y
Production (in units)	10000	5000
Add 50% increase (proposed)	5000	2500
	15000	7500
Selling price per unit	32	30
Less: Variable cost per unit		
Materials	6	7

Labour	10	8
Variable expenses	4	5
	20	20
Contribution per unit	12	10

Total Contribution

X	15000 units x Rs.12	=	Rs.1,80,000
Y	7500 units x Rs.10	=	Rs. 75,000
			Rs.2,55,000

Less: Fixed Cost

X	10000 x 3	=	30000	
Y	5000 x 3	=	15000	
Z	8000 x 2	=	16000	Rs. 61,000
			---	---
Projected Profit			=	Rs.1,94,000

Statement of Present Profit with Products X, Y and Z

				Rs.
Product X	=	10000 units x Rs.9	=	90,000
Product Y	=	5000 units x Rs.7	=	35,000
Product Z	=	8000 units x Rs.6	=	48,000
				1,73,000

Since by discontinuing Product Z and increasing the production of Products X and Y the profit increases from Rs.1,73,000 to Rs.1,94,000. The Directors proposal may be implemented.

Example 26 The Directors of Anandam Ltd. provide you the following data relating to the cycle chain manufactured by them:

		Rs.
Sales 4,000 units @Rs.50 each		2,00,000
Production cost details:	Rs.	
Materials consumed	80,000	
Labour cost	40,000	
Variable overheads	20,000	
Fixed overheads	30,000	1,70,000
Profit		30,000

They require you to answer their following queries:

(i) The number of units by selling which the company will be at break-even.
(ii) The sales needed to earn a profit of 20% on sales.
(iii) The extra units which would be sold to obtain the present profit if it is proposed to reduce the selling price by 20%

Solution:

(i) *Break Even units*:

$$\frac{\text{Fixed cost}}{\text{Contribution per unit}} = \frac{\text{Rs.30,000}}{\text{Rs.15}} = 2000 \text{ units}$$

(ii) *Sales to earn 20% on sales*

Let the units to be sold to earn 20% be x. Therefore sales will be 50x and profit is 20% of 50x i.e. 10x.

Now the total sales should be Fixed Cost + Variable cost + Profit is

$$50x = 30000 + 35x + 10x$$
$$5x = 30000$$
$$x = 6000 \text{ units}$$

Therefore sales required is 6000 units x Rs.50 = Rs.3,00,000

(iii) Extra units to be sold if selling price is reduced by 20%.

Present selling price	Rs.50
Less 20%	Rs.10
New selling price	Rs.40
Less Variable cost	Rs.35
Contribution	Rs. 5

$$\text{Units to be sold} = \frac{\text{Fixed cost + Target Profit}}{\text{Contribution}}$$

$$= \frac{30{,}000 + 30{,}000}{5} = 12000 \text{ units}$$

Extra units to be sold =12000 – 4000 = 8000 units

Summary

However this technique is not without limitations. Cost-Volume-Profit Analysis is a technique of analysis to study the effects of cost and volume variations on profit. It determines the probable profit at any level of activity. It helps in profit planning, preparation of flexible budgets, fixation of selling prices for products, etc.

The break-even point is generally depicted through the break-even chart. The chart shows the profitability of an undertaking at various levels of activity. It brings out the relationship between cost, volume and profit clearly. On the negative side, the limitations of break-even analysis are: difficulty in segregating costs into fixed and variable components, difficulty in applying the technique to multi-product firms, short-term orientation of the concept etc.

Despite these limitations, break-even analysis has some practical utility in that it helps management in profit planning. According to Wheldon, `if the limitations are accepted, and the chart is considered as being an instantaneous photograph of the present position and possible trends, there are some very important conclusions to be drawn from such a chart'.

Self Assessment Questions:

1. Define Marginal Cost.
2. What is meant by Contribution? Explain its significance.
3. Explain the following:
   - (i) Profit Volume Ratio
   - (ii) Break Even Point
   - (iii) Margin of Safety
4. Explain how marginal costing technique is useful as a decision making tool.
5. Critically evaluate marginal costing technique.
6. Break-down of cost per unit at an activity level of 10,000 units of a company is as follows:

	Rs.
Raw materials	**10**
Direct expenses	8
Chargeable expenses	2
Variable overheads	4
Fixed overheads	6

Total cost per unit	30
Selling price	32

Profit per unit	2

How many units must be sold to break-even? **Key : Q.No.6: 7500 units.**

7. Tamarai Ltd., gives you the following information:

	Sales Rs.	Profit Rs.
Period I	1,50,000	20,000
Period II	1,70,000	25,000

Calculate:
(a) The P/V Ratio.
(b) The Profit when sales are Rs.2,50,000
(c) The sales required to earn a profit of Rs.40,000
(d) The break-even point.

Key : Q.No.7: (a) 25%; (b) Rs.45,000; (c) Rs.2,30,000; (d) Rs.70,000.

8. Production costs of Selvi Enterprises Limited are as follows:

	Level of Activity		
Output (in %ge)	60%	70%	80%
Output (in units)	1,200	1,400	1,600
Direct materials	24,000	28,000	32,000
Direct labour	7,200	8,400	9,600
Factory overheads	12,800	13,600	14,400
Works Cost	44,000	50,000	56,000

A proposal to increase production to 90% level of activity is under consideration of the management. The proposal is not expected to involve any increase in fixed factory overheads.

[Hint: Fixed factory overheads Rs.8,000]

Key :Q.No.8: Prime cost Rs.46,800; Marginal cost Rs.54,000; Works costRs.62,000.

9. The following expenses are incurred in the manufacture of 1,000 units of a product in the manufacture of which a factory specialises:

Raw materials	2,800
Wages	1,900
Overhead Charges (Rs.4,000 fixed)	4,200

10,000 units of the product can be absorbed by the home market where the selling price is Rs.9 per unit. There is a demand for 50,000 units of the product in a foreign market if it can be offered at Rs.8.20 per unit. If
this is done, what will be the total profit or loss made by the manufacturer?

Key :Q.No.9: Profit Rs.2,02,000.

10. The following data are obtained from the records of a factory:

	Rs.	Rs.
Sales 4000 units @ Rs.25 each		1,00,000
Less: Marginal Cost		
Materials consumed	40,000	
Labour charges	20,000	
Variable overheads	12,000	

	72,000	
Fixed cost	18,000	90,000
	---	---
Profit		10,000

It is proposed to reduce the selling price by 20%. What extra units should be sold to obtain the same amount of profit as above?

KEY Q.No.10: 10,000 units.

11. You are given the following data for the year 1989 of X Company.

	Rs.	%
Variable costs	6,00,000	60
Fixed costs	3,00,000	30
Net Profit	1,00,000	10
	---	---
Total sales	10,00,000	100
	---	---

Find out (a) Break-even point
(a) P/V Ratio, and
(b) Margin of Safety Ratio

Also draw a break-even chart indicating contribution.

KEY: Q.No.11: (a) Rs.7,50,000; (b) 40%; (c) 25%

12. A firm is selling X product, whose variable cost per unit is Rs.10 and fixed cost is Rs.6,000. It has sold 1,000 articles during one month at Rs.20 per unit. Market research shows that there would be a great demand for the product if the price can be reduced. If the price can be reduced to Rs.12.50 per unit, it is expected that 5,000 articles can be sold in the expanded market. The firm has to take a decision whether to produce and sell 1,000 units at the rate of Rs.20 or to produce and sell for the growing demand of 5,000 units at the rate of Rs.12.50. Give your advice to the management in taking decision.

A publishing firm sells a popular novel at Rs.15 each. At current sales of 20,000 books, the firm breaks even. It is estimated that if the author's royalties were reduced, the variable cost would drop by Rs.1.00 to Rs.7.00 per book. Assume that the royalties were reduced by Rs.1.00, that the

price of the book is reduced to Rs.12 and that this price reduction increases sales from 20,000 to 30,000 books. What are the publisher's profits, assuming that fixed costs do not change?

An analysis of a Manufacturing Co. led to the following information:

Cost Element	Variable cost (% of sales)	Fixed cost Rs.
Direct material	32.8	
Direct labour	28.4	
Factory overheads	12.6	1,89,900
Distribution overheads	4.1	58,400
General administration overheads	1.1	66,700

Budgeted sales Rs.18,50,000

You are required to determine:

(a) the break-even sales volume

(b) the profit at the budgeted sales volume

(c) the profit if actual sales

(i) drop by 80%

(ii) increase by 5% from budgeted sales.

Key : Q.No12: (a) Rs.15,000; (b) Rs.73,000; (c) (i) Rs.34,650; (ii) Rs.9,925

UNIT - III

STANDARD COSTING AND VARIANCE ANALYSIS

Learning Objectives: After studying this lesson you should be able to know:

- The meaning, Merits and Demerits of Standard Costing
- Steps in standard costing
- Analysing Cost and Sales Variances
- To differentiate the Standard Costing and Budgetary Control

Contents:

- Introduction
- Aims of Standard Costing
- Steps in standard costing
- Merits of Standard Costing
- Demerits of Standard Costing
- Variance analysis
- Cost variances
- Computation of sales variances
- Standard Costing Vs. Budgetary Control
- Summary
- Self Assessment Questions

Introduction

Decision accounting consists of several costing techniques. One among the costing techniques which has wide applications in decision situations is Standard costing. Standard Costing is a technique which uses standards for costs and revenues for the purpose of control through variance analysis. Standard Costing involves the setting of predetermined cost estimates in order to provide a basis for comparison with actual costs. Standard Costing is universally accepted as an effective instrument for cost control in industries.

A standard cost is a planned cost for a unit of product or service rendered. H.J. Wheldon, defines "Standard Costs are pre-determined or forecast estimates of cost to manufacture a single unit or a number of units of product during a specific immediate future period". CIMA defines Standard Cost as: "a predetermined calculation of how much costs should be under specified

working conditions. It is built up from an assessment of the value of cost elements and correlates technical specifications and the qualification of materials, labour and other costs to the prices and/or usage rates expected to apply during the period in which the standard cost is intended to be used. Its main purpose is to provide basis for control through variance accounting for the valuation of stock and work-in-progress and in some cases, for fixing selling prices".

Aims of Standard Costing

The specific aims of Standard Costing Technique are:

- To provide a formal basis for assessing performance and efficiency.
- To control costs by establishing standards and analyzing of variances.
- To enable the principle of 'Management by exception' to be practiced at the detailed operational level.
- To assist in setting budgets

Steps in standard costing

- ✓ Determining the standard for Direct Material, Direct labour and different overheads
- ✓ Ascertaining the actual cost of production
- ✓ Ascertaining the variances by comparing actual costs with standard costs
- ✓ Analyse the variances to know the reason for variances.
- ✓ Adopting corrective measures to control the variances in futures

Merits of Standard Costing

The Merits of a Standard costing technique are:

- The setting of standards should result in the best resources and methods being used and thereby increase efficiency.
- Budgets are compiled from standards.
- Actual Costs can be compared with standard costs in order to evaluate performance
- Areas of strengths and weakness are highlighted
- It acts as a form of feed forward control that allows an organization to plan the manufacturing inputs required for different levels of output.
- It acts as a form of feedback control by highlighting performance that did not achieve the standard set.

- It adopts management by exception principle where only those variances (i.e. differences between actual and expected results) which are outside certain tolerance limits are investigated, thereby saving managerial time and maximizing managerial efficiency.
- The process of setting, revising and monitoring standards encourages reappraised of methods, materials and techniques thus leading to cost control as an immediate effect and to cost reduction as a long term effect.

Demerits of Standard Costing

Standard Costing suffers from the following shortcomings:

- A lot of input data is required which can be expensive
- Unless standards are accurately set any performance evaluation will be meaningless.
- Uncertainty in standard costing can be caused by inflation, technological change, economic and political factors, etc. Standards therefore need to be continually updated and revised.
- The maintenance of the cost data base is expensive.
- Setting of standards involves forecasting and subjective judgments with inherent possibilities of error and ambiguity.
- Standard costing cannot be adopted in the firms which do not have uniform and standard production programme.
- It is very difficult to predict controllable and uncontrollable variances.

VARIANCE ANALYSIS

It involves the measurement of the deviation of actual performance form the intended performances. It is based on the principle of management by exception. The attention of management is drawn not only to the variation in monetary gain but also to the responsibility and causes for the same. Variances may be favorable (positive or credit) or unfavorable (or negative or adverse or debit) depending upon whether the actual cost is less or more than the standard cost.

Favorable variance: When the actual cost incurred is less than the standard cost, the deviation is known as favorable variance. The effect of the favorable variance increases the profit. It is also known as positive or credit variance.

Unfavorable variance: When the actual cost incurred is more than the standard cost, the variance is known as unfavorable or adverse variance. It refers to deviation causing the loss to the business. It is also known as negative or debit variance.

Controllable and Uncontrollable variance:

Variances may be controllable or uncontrollable, depending upon the controllability of the factors causing variances.

C***ontrollable variance:*** It refers to a deviation caused by such factors which could be influenced by the executive action. For example, excess usage of materials, excess time taken by a worker, etc. When compared to the standard cost it is controllable as the responsibility can be fixed on the in-charge.

Uncontrollable variance: When variance is due to the factors beyond the control of the concerned person (or department), it is uncontrollable. For example, the wage rate increased on account of strike, government restrictions, change in market price etc. Only revision of standards is required to remove such in future.

Uses

The variance analysis is important tools of cost control and cost reduction and they generate an atmosphere of cost consciousness in the organization.

1. Comparison of actual with standard cost which reveals the efficiency or inefficiency of performance. The inefficiency or unfavorable variance is analyzed and immediate actions are taken.
2. It is a tool of cost control and cost reduction
3. It helps to apply the principle of management by exception.
4. It helps the management to maximize the profits by analyzing the variances into controllable and uncontrollable; the controllable variances are further analyzed so as to bring a cost reduction, indirectly more profit.
5. Future planning and programmes are based on the variance analysis.
6. Within the organization, a cost consciousness is created along with the team spirit.

Computation of variances

Variances are of two types: Cost variances and Sales variances. The causes of variance are necessary to find remedial measures; and therefore a detailed study of variance analysis is essential. Variances can be found out with respect to all the elements of cost, i.e., direct material, direct labour and overheads. The following are the common variances, which are calculated by the management to control the cost.

Material variances Labour variances Overhead variances (a) variable (b) fixed

COST VARIANCES

The difference between the standard cost and the actual cost is known as 'cost variance'. The total cost variance should be split into its constituent parts, in order to analyze the cost variances in greater detail. The constituents of cost variances are :

Total Cost Variance

```
                 |-----------------------------------|-----------------------------------|
            Direct Material                 Direct Labour                 Overhead
      Cost Variance                   Cost Variance                 Cost Variance
        (DMCV)                          (DLCV)                        (OCV)
           |                                |                             |
    |-----------------|             |--------------------|          |--------------------|
  Price          Usage          Rate           Efficiency   Variable          Fixed
Variance       Variance       Variance         Variance    Overhead        Overhead
(DMPV)         (DMUV)         (DLRV)           (DLEV)       Cost             Cost
                                                           Variance         Variance
                                                           (VOVC)           (FOCV)
                                                                                |
                                                        |------------------------------|
                                                     Expenditure                 Volume
                                                      Variance                   Variance
                                                     (FOEXPV)                    (FOVV)
```

Direct Material Cost Variance

It is the difference between the standard cost of material specified for the output achieved and the actual cost of materials used. The standard cost materials is computed by multiplying the standard price with the standard quantity for actual output and the actual cost is obtained by multiplying the actual price with actual quantity. The formula is:

= Standard cost for actual output – Actual cost

OR

DMCV = (Standard price × Standard Quantity for Actual output)

– (Actual price × Actual Quantity)

= (SP × SQ) – (AP × AQ).

Problem 1. The standard cost of material for manufacturing a unit of a particular product is estimated as under :

16 kg of raw materials @ Rs. 1 per kg. On completion of the unit it was found that 20 kg. of raw material costing Rs. 1.50 per kg. have been consumed. Compute material cost variance:

DMCV= (SP × SQ) – (AP × AQ)

= (16 × 1) – (20 × 1.50)

= Rs. 14 (Adverse)

Direct Material Price Variance (DMPV)

It is that portion of material cost variance which is due to the difference between the standard prices specified and the actual price paid. This variance may be due to a number of reasons: change in price, inefficient buying, standard quality of materials not purchased, favorable discounts not obtained etc. The formula is:

DMPV = Actual Quantity (Standard Price – Actual Price)

If the actual price is more than the standard price, the variance would be adverse and in case the standard price is more than the actual price, it would result in a favourable variance.

Problem 2. Use the information given in problem 1 and compute the Material Price Variance.

DMPV = AQ (SP – AP)

= 20 (1 – 1.50) = Rs. (10) Adverse.

Direct Material Usage or Quantity Variance (DMUV)

It is the difference between the standard quantity specified and the actual quantity used. This variance may arise because of: careless handling of materials, wastage, spoilage, theft, pilferage, changes in product design, use of inferior materials, defective tools and equipment etc. The formula is:

DMUV = Standard Price (Standard Quantity for Actual Output – Actual Quantity)

= SP (SQ – AQ).

Problem 3. Use the information given in **Problem** 1 and compute the Material Usage Variance.

DMUV = SP (SQ – AQ)

= 1 (16 – 20) = Rs. 4 (Adverse)

Note. The total of material price and usage variances is equal to material cost variance. Thus,

DMCV = DMPV + DMUV

In the example that has been used so far, let us verify this:

DMCV = DMPV + DMUV

Rs. 14 (A) = Rs. 10 (A) + Rs. 4 (A)

Problem 4. A Corrugated Boxes manufacturing company had adopted standard costing furnishes the following information.

Standard :

Material for 70 kgs. Finished Products	100 kgs.
Price of Material	Rs. 1 per kg.

Actual :

Output	2,10,000 kgs.
Materials Used	2,80,000 kgs.
Cost of Materials	Rs.2,52,000

Calculate :

a) Material Usage Variance b)Material Price Variance c)Material Cost Variance

Solution: For an output of Rs.70 kgs. of finished products, Standard Quantity of Material output is 100 kgs.

Therefore for the output of 2,10,000 kgs., Standard Quantity of material input should be = $\{100/70 \times 2,10,000\}$ = 3,00,000 kgs.

Actual Price per kg. = 2,52,000 / 2,80,000 = .90 paise

(a) Material Usage Variance :

= Standard Price (Standard Quantity – Actual Quantity)

= Rs.1 (3,00,000 – 2,80,000) = Rs. 20,000 (Favorable)

(b) Material Price Variance :

= Actual Quantity (Standard Price – Actual Price)

= 2,80,000 (1- .90) = Rs. 28,000 (Favorable)

(c) Material Cost Variance :

= Standard Quantity × Standard Price – Actual Quantity × Actual Price

= (3,00,000 × 1) – (2,52,000)

= Rs. 48,000 (Favorable)

Verification:

Material cost Variance = Material Price Variance + Material Usage Variance.

Rs.48,000 (Favorable) = Rs.28,000 (Favorable) + Rs.20,000 (Favorable).

Problem 5. From the following particulars Calculate :

(i) Total Materials Cost Variance;

(ii) Material Price Variance; and

(iii) Material Usage Variance.

Standard			*Actual*	
Materials	*Units*	*Price (Rs.)*	*Units*	*Price (Rs.)*
X	1,010	1.0	1,080	1.2
Y	410	1.5	380	1.8
Z	350	2.0	380	1.9

Solution:

(i) Material Cost Variance = (SQ × SP) – (AQ × AP)

Standard Cost Materials	Rs.	Rs.	Actual Cost Materials	Rs.	Rs.
Material X 1,010 units @ 1.0 =		1,010	1080 units @ 1.20 =		1,296
Material Y 410 units @ 1.5 =		615	380 units @ 1.80 =		684
Material Z 350 units @ 2.0 =		700	380 units @ 1.90 =		722
Total Standard Cost		2,325	Total Actual Cost		2,702

∴ Materials Cost Variance = Rs. 2,325 – Rs. 2,702

= Rs. 377 Adverse.

(ii) Material Price Variance

= Actual Quantity (St. Price – Actual Price)

Material X : 1,080 Units (1 – 1.20) = 216 Adverse
Material Y : 380 Units (1.5 – 1.80) = 114 Adverse
Material Z : 380 Units (2.0 – 1.90) = 38 Favourable

Total Material Price Variance = 292 Adverse

(iii) Material Usage Variance

= St. Price (St. Quantity – Actual Quantity)

Material X : Rs. 1 (1,010 Units – 1,080 Units) = Rs. 70 Adverse
Material Y : Rs. 1.5 (410 Units – 380 Units) = Rs. 45 Favourable
Material Z : Rs. 2 (350 Units – 380 Units) = Rs. 60 Adverse

Total Material Usage Variance = Rs. 85 Adverse

Verification

Materials Cost Variance = Materials Price Variance + Material Usage Variance

Rs. 377 (A) = Rs. 292 (A) + Rs. 85 (A) = Rs. 377 Adverse

Problem 6. From the following particulars of Zona Ltd compute Material Cost Variance, Price Variance and Usage variance.

Quantity of materials purchased	3000 unit
Value of materials purchased	Rs. 9,000
Standard quantity of materials required per tonne of output	30 units
Standard price of material	Rs. 2.50 per unit
Opening stock of material	Nil
Closing stock of material	500 units
Output during the period	80 tonnes.

Solution.

Material consumed = 3,000 – 500 = 2,500 units

Actual price of material = Rs. 9,000/3,000 = Rs. 3 per unit

Standard quantity for actual output = 30 × 80 = 2,400 units

Material Cost Variance (DMCV) = (St. Price × Std. Qty) – (Actual Price × Actual Quantity)

= (2.50 × 2,400) – (3 × 2,500)

= 6,000 – 7,500 = Rs. 1,500 (Adverse)

Material Price Variance (DMPV) = Actual Quantity (SP – AP)

= 2,500 (2.50 – 3) = 2,500(.50)

= Rs. 1,250 (Adverse)

Material Usage Variance (DMUV) = Std. Price (SQ - AQ)

= 2.50(2,400 – 2,500)

= Rs. 250 (Adverse)

Verification :

DMCV = DMPV + DMUV

1,500 (A) = 1,250 (A) + 250 (A)

Problem 7. The standard cost given for material consumption are 40 kgs. at Rs. 10 per kg., compute the variances when actuals are :

(a) 48 kgs. at Rs. 10 per kg.

(b) 40 kgs. at Rs. 12 per kg.

(c) 48 kgs. at Rs. 12 per kg.

(d) 36 kgs. At Rs. 10 per kg.

Solution :

Material Cost Variance = (SQ × SP) – (AQ × AP)

(a) 40 kgs. @ Rs. 10 – 48 kgs. @ Rs. 10 = Rs. 80 Adverse

(b) 40 kgs. @ Rs. 10 – 40 kgs. @ Rs. 12 = Rs. 80 Adverse

(c) 40 kgs. @ Rs. 10 – 48 kgs. @ Rs. 12 = Rs. 176 Adverse

(d) 40 kgs. @ Rs. 10 – 36 kgs. @ Rs. 10 = Rs. 40 Favourable

Material Usage Variance = Standard Price (Standard Qty. – Actual Qty.)

(a) Rs. 10 [40 kgs. – 48 kgs.] = Rs. 80 Adverse

(b) Rs. 10 [40 kgs. – 40 kgs.] = Nil

(c) Rs. 10 [40 kgs. – 48 kgs.] = Rs. 80 Adverse

(d) Rs. 10 [40 kgs. – 36 kgs.] = Rs. 40 Favourable

Material Price Variance = AQ(SP – AP)

(a) 48 kgs. [Rs. 10 – Rs. 10] = Nil

(b) 40 kgs. [Rs. 10 – Rs. 12] = 80 Adverse

(c) 48 kgs. [Rs. 10 – Rs. 12] = 96 Adverse

(d) 36 kgs. [Rs. 10 – Rs. 10] = Nil

Direct Labour Cost Variance (DLCV)

Labour variances are calculated like material variances. The Direct Labour Cost Variance is the difference between the standard direct wages specified for the activity achieved and the actual direct wages paid.

DLCV = Standard cost for Actual output – Actual cost

OR

= (Standard rate × standard time for actual output) – (Actual Rate × Actual Time)

= (SR × ST) – (AR × AT)

Problem 8:

Standard hours	5,000
Standard wage rate	Rs. 4 per unit
Actual hours	6,000
Actual wage rate	Rs. 3.50 per unit

Calculate labour cost variance.

Solution :

DLCV = (SR × ST) – (AR × AT)

= (4 × 5,000) – (3.50 × 6,000)

= 20,000 – 21,000

= Rs. 1,000 (Adverse)

The labour cost variance may arise on account of difference in either rates of wage or time. Thus, it may be analysed further as (i) labour rate variance, and (ii) labour time or efficiency variance.

Direct Labour Rate Variance (DLRV)

It is the difference between the standard rate specified and the actual rate paid. It is also called 'Rate of Pay Variance or Wage Rate Variance'. This would arise, usually, because of : (i) excessive overtime, (ii) employment of wrong type of labour (employing skilled person in place of an unskilled one), (iii) overtime workers engaged more or less than the standard, (iv) employment of labour at higher rates due to shortage of workers etc. The formula for calculating labour rate variance is as under :

Direct Labour Rate Variance = Actual Time (Standard Rate – Actual Rate)

DLRV = AT (SR – AR)

Direct Labour Time or Efficiency Variance (DLEV)

It is the difference between the standard labour hours specified and the actual hours spent on the works. This variance is primarily concerned with the standard wage rate. As such, where piece wage payment is in force, there will be no labour efficiency variance. Labour Efficiency Variance arises on account of any one or combination of factors such as : (i) lack of supervision, (ii) poor working conditions in the factory, (iii) use of sub-standard or higher standard materials, (iv) inefficiency of workers due to inadequate training, (v) lack of proper tools, equipment and machinery, (vi) higher labour turnover etc. Symbolically,

Labour Time or Efficiency Variance = Standard Rate (Standard Time for Actual output – Actual Time)

DLEV = SR (ST – AT)

Problem 9. Data relating to a job are as thus:

Standard rate of wages per hour	Rs. 100
Standard hours	300
Actual rate of wages per hour	Rs. 120
Actual hours	200

You are required to calculate –

(i) Labour Cost Variance, (ii) Labour Rate Variance and (iii) Labour Efficiency Variance.

Solution.

(i) Labour Cost Variance = Standard Cost – Actual Cost

= (Std. Rate × Std. Time) – (Actual Rate × Actual Time)

= (300 × 100) – (200 × 120)

= 3,0000– 2,4000 = 6000 (Favourable)

(ii) Labour Rate Variance = Actual Time (Std. Rate – Actual Rate)

= 200 (100 – 120) = 4000 (Adverse)

(iii) Labour Efficiency Variance = Std. Rate (Std. Time – Actual Time)

= 100 (300 – 200) = 10,000 (Favourable).

Verification :

DLCV = DLRV + DLEV

6000 (F) = 4000(A) + 10000(F)

Problem 10. Standard hours for manufacturing two leather products Belt and Purse are 15 hours per unit and 20 hours per unit respectively. Both products require identical kind of labour and the standard wage rate per hour is Rs. 5. In the year 2011, 10,000 units of Belt and 15,000 units of Purse were manufactured. The total of labour hours actually worked were 4,50,500 and the actual wage bill came to Rs. 23,00,000. This included 12,000 hours paid for @ Rs. 7 per hour and 9,400 hours paid for @ Rs. 7.50 per hour, the balance having been paid at Rs. 5 per hour. You are required to compute the labour variances.

Solution :

Labour cost variance = Standard cost for actual output – Actual cost

Standard cost :

Standard Time : Belt = 10,000 × 15 = 1,50,000
Purse = 15,000 × 20 = 3,00,000
- - - - - - - - -
4,50,000 Hours
- - - - - - - - - -

Rs.

For product Belt = 10,000 × 15 × 5 = 7,50,000
For Product Purse = 15,000 × 20 × 5 = 15,00,000
- - - - - - - - -
Total standard cost 22,50,000
- - - - - - - - -
Rs. Rs.

Total actual cost = 23,00,000
Labour cost variance = 22,50,000 – 23,00,000
= 50,000 (A)

Labour rate variance = Actual hours × (Std. Rate – Actual Rate)

Rs. Rs.

= 12,000(5 – 7) = 24,000 (A)
= 9,400(5 – 7.50) = 23,500 (A)
= 4,29,100(5 – 5) = –
- - - - - - - - - -
Total 47,500 (A)
- - - - - - - - - - -

Labour rate variance = Std. rate × (Std. time – Actual time)

= Rs. 5 × (4,50,000 – 4,50,500)

= Rs.2,500 (A)

Verification:

Labour cost variance = Labour rate variance + Labour efficiency variance

50,000 (A) = Rs. 47,500 (A) + Rs. 2,500 (A)

= Rs. 50,000 (A)

Idle Time Variance (ITV)

Idle Time Variance, a component of Labour Efficiency Variance, is represented by the standard cost of the actual hours for which the workers remain idle due to abnormal circumstances, like non-availability of raw materials, power cut, breakdown of machinery etc.

Idle Time Variance = Standard Hourly Rate × Idle Time or Hours

= SR × IT

This variance is always adverse. The total of labour rate, idle time and efficiency variances would be equal to labour cost variance, as shown below:

Problem 11. 100 workers are working in a factory at a standard wage of Rs. 4.80 per hour. During a month there are four weeks of 40 hours each. The standard performance is set at 360 units per hour. The following is the summary of the wages paid during the month:

91 workers were paid @ Rs. 4.80 per hour

5 workers were paid @ Rs. 5.00 per hour

The remaining were paid @ Rs. 4.60 per hour

Power failure stopped production for 2 hours Actual production 57,960 units. Calculate Labour Variances.

Solution.

1. Labour Cost Variance

= Standard Cost – Actual Cost

= Rs. 77,280 – Rs. 76,832 = Rs. 448 (Fav.)

(i) Standard Cost

= Std. Rate per hour × 100 × Units produced / Std. production per hour

= 4.80 × 100 × 57,960 / 360 = Rs. 77,280

(ii) Actual Cost for the month (for 40 × 4 = 160 hrs.)

No. of workers × hrs. during the month × Rate paid.

	Rs.
91 × 160 × 4.80 =	69,888
5 × 160 × 4.80 =	4,000
4 × 160 × 4.60 =	2,944
	- - - - - -
	76,832
	- - - - - -

2. Labour Rate Variance

= Actual Hours (Std. Rate – Actual Rate)

(a) (5 × 160) (Rs. 4.80 – Rs. 5.00) = Rs. – 160 (Adv.)

(b) (4 × 160) (Rs. 4.80 – Rs. 4.60) = Rs. + 128 (Fav.)

- - - - - - - -

Rs. – 32 (Adv.)

Note. For 91 workers rate variance is not calculated because they are paid at Std. Rate.

3. Labour Efficiency Variance

= Std. Rate (Standard Time – Actual Time)

= Rs. 4.80 (16,100 hours – 15,800 hours)

= Rs. 1,440 (Fav.)

Notes. ***(i) Standard Time***

= No. of employees × Quantity produced / Std. Quantity per hour

= 100 × 57,960 / 360 = 16,100 hours.

(ii) Actual Time

= Possible Hours – Idle Time

= 100 × 160 hours – 100 × 2 hours

= 15,800 hours

4. Idle Time Variance

= Std. Rate × Idle Time

= Rs. 4.80 × 200 hours = 960 (A)

Verification : LCV = LRV + LEV + ITV

448 (F) = Rs. 32 (A) + Rs. 1,440 (F) + 960 (A)

= Rs. 448 (F).

OVERHEAD VARIANCE

Overhead cost variance is the excess/shortfall between standard overheads for actual output i.e. Recovered Overheads and Actual Overheads. It is the total of both fixed and variable overhead variances. Those costs which tend to vary directly in proportion to changes in the volume of production are variable overheads. Fixed overheads consist of costs which are not subject to change with the change in the volume of production. The variances under overheads could be analysed under two heads, viz Variable Overheads and Fixed Overheads:

Overheads Cost Variance= Standard Total Overheads-Actual Total Overheads

The term overhead includes indirect material, indirect labour and indirect expenses and the variances relate to factory, office or selling and distribution overheads. Overhead variances are divided into two broad categories: (i) Variable overhead variances and (ii) Fixed overhead variances. To compute overhead variances, the following terms must be understood:

a) Standard overhead rate per unit

$$= \frac{\text{Budgeted overheads}}{\text{Budgeted output}}$$

b) Standard overheads rate per hour

$$= \frac{\text{Budgeted overheads}}{\text{Budgeted hours}}$$

c) Standard hours for actual output

$$\frac{\text{Budgeted hours}}{\text{Budgeted output}} \times \text{Actual output}$$

d) Standard output for actual time

$$\frac{\text{Budgeted output}}{\text{Budgeted hours}} \times \text{Actual hours}$$

e) Recovered or Absorbed overheads = Standard rate per unit x Actual output

f) Budgeted overheads = Standard rate per unit x budgeted output

g) Standard overheads = Standard rate per unit x Standard output for actual time

h) Actual overheads = Actual rate per unit x Actual output

VARIABLE OVERHEAD VARIANCE

Variable cost varies in proportion to the level of output, while the cost is fixed per unit. As such the standard cost per unit of these overheads remains the same irrespective of the level of output attained. As the volume does not affect the variable cost per unit or per hour, the only factors leading to difference is price. It results due to the change in the expenditure incurred.

(i) ***Variable Overhead Expenditure Variance***:

It is the difference between actual variable overhead expenditure incurred and the standard variable overheads set in for a particular period. The formula is:-

{Actual Hours Worked x Standard Variable Overhead Rate per hour}-Actual Variable overheads

(ii) Variable Overhead Efficiency Variance:

It shows the effect of change in labour efficiency on variable overheads recovery. The formula is:-

Standard Rate (Standard Quantity-Actual Quantity)

Standard Overhead Rate= (Standard Time for Actual output- Actual Time)

(iii) Variable Overhead Variance

It is divided into two: Overhead Expenditure Variance and Overhead Efficiency Variance. The formula is:-

Variable overhead Expenditure Variance + Variable overhead Efficiency variance

FIXED OVERHEAD VARIANCE (FOHV):

Fixed overhead variance depends on (a) fixed expenses incurred and (b) the volume of production obtained. The volume of production depends upon (i) efficiency (ii) the days for which the factory runs in a week (calendar variance) (iii) capacity of plant for production.

FOHV = Actual Output (Fixed Overhead Rate - Actual Fixed Overheads)

(a) **Fixed Overhead Expenditure Variance**. (Budgeted or cost Variance). It is that portion of the fixed overhead which is incurred during a particular period due to the difference between the budgeted fixed overheads and the actual fixed overheads.

Fixed Overhead expenditure variance=Budgeted fixed overhead-Actual fixed overhead

(b) **Fixed Overhead Volume Variance**. This variance is the difference between the standard cost of overhead absorbed in actual output and the standard allowance for that output. This variance measures the over or under recovery of fixed overheads due to deviation of actual output forms the budgeted output level.

(i) On the basis of units of output:

Fixed Overhead Volume Variance = Standard Rate (Budgeted Output-Actual Output) OR

= (Budgeted Cost –Standard Cost)

OR

= (Actual Output x Standard Rate)-Budgeted fixed overheads

(ii) On the basis of standard hours:

Fixed Overhead Volume Variance

=Standard Rate per hour (Budgeted Hours-Standard Hours)

Standard Hour = Actual Output + Standard Output per hour.

Problem 12.

S.V. Ltd has furnished you the following data:

	Budget	Actual July 1994
No. of working days	25	27
Production in units	20,000	22,000
Fixed overheads	Rs.30,000	Rs.31,000

Budgeted fixed overhead rate is Re. 1 per hour. In July 1994, the actual hours worked were 31,500.

Calculate the following variance: (i) Efficiency Variance (ii) Capacity variance (iii) Volume variance (iv) Expenditure variance and (v) Total overhead variance.

Answer:

$$\text{Recovered overhead} = \frac{\text{Budgeted overhead}}{\text{Budgeted output}} \times \text{Actual output}$$

$$= \frac{30{,}000}{20{,}000} \times 22{,}000$$

= 33,000

(i) Efficiency Variance = Standard Rate per hour (Standard hours for actual production – Actual hours)

= Re. 1 x (33,000 – 31,500)

= Rs.1,500 (F)

(ii) Capacity Variance = Standard Rate per hour x (Actual hours - Budgeted hours)

= Standard overheads - Budgeted overheads

= Re. 1 x (31,500 – 30,000)

= Rs.1500 (F)

(iii) Volume variance = Recovered overhead – Budgeted overheads

= Rs. 33,000 – Rs. 30,000

= Rs. 3,000 (F)

(iv) Expenditure variance = Budgeted overheads – Actual overheads

= Rs.30,000 – Rs.31,000

= Rs.1,000 (A)

(v) Total overhead variance = Recovered overhead – Actual overheads

= Rs.33,000 – Rs.31,000

= Rs.2,000 (F)

Problem 13.

Swathi Ltd.has furnished you the following for the month of August 2004.

	Budgeted	Actual
Output (Units)	30,000	32,500
Hours	30,000	33,000
Fixed hours	Rs. 45,000	50,000
Variable overhead	Rs. 60,000	68,000
Working days	25	26

Calculate the variances.

Answer:

Standard Overhead Rate per Unit

$$= \frac{\text{Budgeted Overheads}}{\text{Budgeted Output}}$$

$$\frac{30,000}{30,000} = 1 \text{ hours}$$

Total standard overhead rate per hour

$$= \frac{\text{Budgeted overheads}}{\text{Budgeted hours}}$$

$$= \frac{1,05,000}{30,000} = \text{Rs.3.50 per hour}$$

Standard fixed overhead rate per hour

$$= \frac{\text{Budgeted fixed overheads}}{\text{Budgeted hours}}$$

$$= \frac{45,000}{30,000} = \text{Rs.1.50}$$

Standard variable overhead rate per hour

$$= \frac{\text{Budgeted variable overheads}}{\text{Budgeted hours}}$$

$$= \frac{60,000}{30,000} = \text{Rs.}2$$

Overhead cost variance = Recovered overheads – Actual overheads

Recovered overhead = Actual output x Standard Rate per unit

= 32,500 x Rs.3.50 = Rs.1,13,750

Overhead cost variance = 1,13,750 – 1,18,000

= Rs.4,250 (A)

Variable overhead cost variance = Recovered overheads – Actual overheads

= 32,500 hrs x Rs.2 – Rs.68,000

= Rs.3,000 (A)

Fixed overhead cost variance = Recovered overheads – Actual overheads

= 32,500 hrs x Rs.1.50 – Rs.50,000

= 48,750 – 50,000 = Rs.1,250 (A)

Expenditure variance = Budgeted overheads – Actual overheads

= Rs.45,000 – Rs.50,000

= Rs.5000 (A)

Volume variance = Recovered overheads- Budgeted overheads

= 32500 hrs x Rs.1.50 – 45,000

= 48,750 – 45,000

= Rs.3,750 (F)

Efficiency variance = Recovered overheads- standard overheads

OR

Standard rate (Standard hours for actual output – Actual hours)

= 1.50 (32,500 – 33,000)

= Rs.750 (A)

Capacity variance = standard overheads – Budgeted overheads

Or

= Standard Rate (Actual hours - Budgeted hours)

= Rs.1.50 (33,000 – 30,000)

= Rs.4,500 (F)

Calendar variance = Extra / Deficit hours worked x Standard Rate.

One extra day has been worked.

.. The Total number of extra hours worked

$$= \frac{30,000}{25} = 1,200$$

=1,200 x 1.50 = Rs.1,800 (F)

Note:

1. (F) – Favourable; (A) – Adverse (or) Unfavaourable
2. When Standard is more than the Actual, it is favourable variance
3. When Actual is more than the Standard, it is unfavourable or adverse variance
4. In place of 'Time', the term 'Hours' may also be used.

COMPUTATION OF SALES VARIANCES

Sales are affected by two factors (i) the selling price and (ii) the quantity of sales the variations in the standards set and actual for the purpose may be mainly due to change in market trends. Normally, if the selling price increases, the volume of sales will be lower than the standard. It is to be kept in mind that higher price is to be seen as a favorable variance (higher price paid for material will be an adverse variance) and lower volume of sales is to be looked as an unfavorable (in case of materials, it is the other way around, i.e. lower usage of materials than the standard causes a favorable variance). It is well known that demand and supply position in the market decide the quantity of sales as well as the selling price. The variations may be on account of control lab: as well as non-controllable factors.

- **Sales Value Variance**

The difference between budgeted sales and actual sales results in Sales Value variance.

The Formula is:

Sales Value Variance = Actual value of sales – Standard value of sales

- **Sales Price Variance**

It is on account of the difference in actual selling price and the standard selling price for actual quantity of sales. The formula is:

Sales price variance = Actual Quantity Sold (Actual price-Standard price)

- **Sales Volume Variance**

Budgeted sales may be different from the standard sales. In other words, budgeted quantity of sales at standard price may vary from the actual quantity of sales at standard prices. Thus, the variance is a result of difference in budgeted and actual quantities of goods sold. The formula is: Sales volume variance = Standard price (Actual units – Standard units).

Problem 14.

The budgeted and actual sales for a period in respect of two products are as follows:

Product	**Budgeted**			**Actual**		
	Qty (Units)	**Price (Rs)**	**Value (Rs)**	**Qty (Units)**	**Price (Rs)**	**Value (Rs)**
A	500	2	1700	700	3	3100
B	700	3	3100	500	2	1700

Find out sales variance

Solution

(i) Sales value variance = Actual sales – Standard sales

Total actual value = 3100+1700 = 4800
Total standard value = 1700+3100=4800
Sales value variance = 4800-4800 = Nil

(ii) Sales price variance = Actual Quantity Sold (Actual price-Standard price)

Product A 700 (3-2) = 700 (F)
Product B 500 (2-3) = 500 (A)
---
200 (F)

(iii) Sales volume variance = Standard price (Actual units – Standard units)

Product A 2(700-500) = 400 (F)
Product B 3(500-700) = 600 (A)
---
200 (A)

F =Favorable A= Adverse

Problem 15. From the following data, calculate sales variances with an assumption that products are homogenous in nature.

	Budget			Actual		
Product	**Quantity Units**	**Selling Price Rs**	**Sales Rs**	**Quantity Units**	**Selling Price Rs**	**Sales Rs**
A	800	11	8800	900	10	9000
B	1200	8	9600	600	9	5400
	2000		18400	1500		14400

Solution:

Sales Value Variance = Actual Sales - Standard Sales
= Rs.14400 -18400
= 4000 (A)

Sales Price Variance = Actual Quantity sold (Actual Price - Standard Price)

A = 900 x (10 – 11) = Rs.900 (A)

B = 600 x (9 – 8) = Rs.600 (F)

Total Rs.300 (A)

Sales volume variance = Standard price (Actual units – Standard units)

Product A 11(900-800) = 1100 (F)

Product B 8(600-1200) = 5400 (A)

4300 (A)

Disposition of Variances:

According to the strict principles of cost accounting, each variance should be carefully analysed so that causes of the occurrence may be ascertained. Then each variance should be disposed of in accordance with the underlying reasons for its existence. All the variances which are the result of controllable operation should be transferred to Costing Profit and Loss Account. On the other hand, those variance which are the result of uncontrollable conditions like changes in material prices, wage rate change etc should be apportioned to inventories and cost of goods sold on some equitable basis.

Standard Costing Vs. Budgetary Control

Standard Costing and Budgetary Control are control techniques adopted in a firm with specific objectives. Following points of differences between the two can be observed:

i. Standard Costing is a long range control activity developed and adopted with focus on production. Budgetary Control is an activity concerned with every functional area of the firms and functional budgets are prepared to control that function in a shorter term.
ii. Standard Costs are scientifically predetermined. Budgetary Control is concerned with the overall profitability and financial position of the concern.
iii. Standard costing is concerned with ascertainment and control of costs. Budgetary control is concerned with the overall profitability and financial position of the concern.
iv. The emphasis of Standard Costing is on what should be the cost whereas in Budgetary Control the emphasis is on the level of costs not to be exceeded.
v. Standards are determined for each element of cost. Budgets are determined for a specified period.
vi. Standard cost is a projection of cost accounts. Budget is a production of financial accounts.
vii. Standard costing is concerned with the control of costs and is more intensive in scope. Budgetary control is concerned with the operation of business as a whole and is more extensive.

Summary

Standard costing with the aid of variance analysis ensures Cost Control thereby facilitate the profit maximization efforts. . Cost control is achieved by adopting the following steps: pre – determination of standard costs, consumption of actual costs, comparison of actual costs with standard costs and recording of the variances if any and analyzing and reporting on these variances to the management so that suitable action may be taken whenever necessary in order to control the costs in future.

Cost Variance' is the difference between the standard cost and the actual cost. If actual cost is less than the standard cost, the variance is favorable. If the actual cost is more than the standard cost, the variance is unfavorable. A favorable variance indicates efficiency, while an unfavorable one denotes inefficiency. However, mere knowledge of these variances would not be useful for ensuring cost control. These have to be thoroughly analyzed so as to find out the contributory factors and also to see whether they are amenable to control or not. The term 'variance analysis',

thus, may be defined as 'the resolution into constituent parts and the explanation of variances'. Cost variances are disposed of in one of the following ways:

1. Transfer to profit and loss account, keeping work-in-progress, finished goods and cost of sales at standard cost.
2. Transfer to cost of sales, thus practically converting the standard cost of sales into actual cost of sales.
3. Prorating to cost of sales and inventories, either on the basis of units or value, so that both the inventories and cost of goods sold will be shown at actual costs.

Self Assessment Questions

1. A furniture manufacturer makes sun mica tops for tables. From the following information, find out price variance, usage variance and Material cost variance.

Standard quantity of Sun mica per table	4 Sq. ft.
Standard price per sq. ft. of Sun mica	Rs. 5.00
Actual production of tables	1,000
Sun mica actually used	4,300 sq. ft.
Actual purchase price of Sun mica per Sq. ft.	Rs. 5.50

Who is the responsible for these variances?

Key Q.No 1: (i) Price Variance Rs. 2150 (A) (ii) Usage Variance Rs. 1500 (A)

(iii) Cost Variance Rs. 3650 (A)

2. Compute price and usage variances from the data given below:

	Standard			Actual		
	Quantity Kg.	Unit Price	Total	Quantity Kg.	Units Price	Total
		Rs.	Rs.		Rs.	Rs.
Material A	4	1.00	4.00	2	3.50	7.00
Material B	2	2.00	4.00	1	2.00	2.00
Material C	2	4.00	8.00	3	3.00	9.00
Total	8		16.00	6		18.00

Key Q.No 2: (i) Material Cost variance Rs. 2 (A) (ii) Material price Variance Rs. 2 (A)

(iii) Material Usage Variance – Nil

3. The Standard cost card for a product shows:

	Per Unit Rs.
Material cost – 2 kg. @ 2.50 each	5.00
Wages – 2 hours @ 50 P. each	1.00

The actual which have emerged from business operations are as follows:

Production	8,000 units
Material consumed:	
16,500 kgs. @ Rs.2.40 each	Rs. 39,600
Wages Paid:	
18,000 hours @ 40 P. each	Rs. 7,200

Calculate appropriate material and labour variances.

KEY Q.No 3: (i) MCV Rs. 400 (F) (ii) MPV Rs. 1650 (F) (iii) MUV Rs. 1250 (A)

(iv) LCV: Rs. 800 (F) (v) LEV: Rs. 1000 (A) (vi) LRV: Rs.1800 (F)

4. The standard cost for a product is:

Time 10 hours per unit, cost Rs. 5 per hour.

The actual performance was:

Production	1,000 units
Hours taken:	
Production	10,400 hours
Idle time	400 hours
Total time	10,800 hours

Payment mode, Rs. 56,160 @ Rs. 5.20 per hour

Calculate (a) Labour rate variance, (b) Labour efficiency variance, (c) Idle time Variance, (d) Labour cost variance.

Key Q.No 4: (i) LCV: Rs.6160 (A) (ii) LRV: Rs. 2160 (A)

(iii) LEV: Rs. 2000 (A) (iv) ITV: Rs. 2000 (A)

5. Following is the data of a manufacturing concern. Calculate:-

Material Cost Variance, Material Price Variance and Material usage variance.

The standard quantity of materials required for producing one ton of output is 40 units. The standard price per unit of materials is Rs. 3. During a particular period 90 tons of output was undertaken. The materials required for actual production were 4,000 units. An amount of Rs. 14,000 units. An amount of Rs.14, 000 was spent on purchasing the materials.

(MCV:Rs.3,200(A), MPV: Rs.2,000 (A), MUV Rs.1,200 (A)

6. From the data given below, calculate: Material Cost Variance, Material Price Variance and Material Usage Variance

Products	Standard Quantity (units)	Standard Price Rs.	Actual Quantity (units)	Actual Price
A	1,050	2.00	1,100	2.25
B	1,500	3.25	1,400	3.50
C	2,100	3.50	2,000	3.75

(MCV (-) Rs.550 (A), MPV: (-) Rs.1,125 (A), MUV(-) Rs.575 (A)

7. Calculate material mix variance form the data given as such:

	Standard		**Actual**	
Materials	**Quantity (units)**	**Price per unit Rs.**	**Quantity (units)**	**Price per unit Rs.**
A	50	2.00	60	2.25
B	100	1.20	90	1.75

Due to the shortage of material A, the use of material 'A' was reduced by 10% and that of 'B' increased by 5% Ans: (Material Mix Variance = -12 (A)

8. From the following data calculate various material variances:

	Standard	Actual		
Materials	Quantity (units)	Price per unit Rs.	Quantity (units)	Price per unit Rs.
A	80	8.00	90	7.50
B	70	3.00	80	4.00

(MCV; Rs.145 (A), MPV: Rs.35 (A), MUV: Rs.110 (A), MMV: Rs.3.3 (F)

9. From the following information, Calculate material yield variance:

	Standard		Actual	
Materials	Quantity (units)	Price per unit Rs.	Quantity (units)	Price per unit Rs.
A B	80 70 …… 150	5 9	60 90 ….. 150	4.50 8.00

There is a standard loss of 10%. Actual yield is 125 units. (MYV: Rs.76.3 (A)

10. Sastha Ltd. produces an articles by blending two basic raw materials. It operates a standard costing system and the following standards have been set for raw materials.

Material	**Standard Mix**	**Standard price per kg.**
A	40%	Rs.4.00
B	60%	Rs. 3.00

The standard loss in processing is 15%. During April, 1980, the company produced 1,700 kg of finished output. The position of stock and purchase for the month of April, 1980 are as under:

Material	Stock on 1-4-80	Stock on 30-4-80	Purchased during April, 1980	
	kg	kg	kg	Cost Rs.
A	35	5	800	3,400
B	40	50	1,200	3,000

Calculate the following variances:

Material Cost Variance, Material Price Variance, Material Usage Variance, Material Yield Variance and Material Mix Variance.

(MCV: Rs.286 (F), Material Price Variance: Rs. 376.75 Favourable, Material Usage Variance. Rs.90 unfavoruable, Material Mix Variance: Rs. 22 Adverse)

11. In a manufacturing concern, the standard time fixed for a month is 8,000 hours. A standard wage rate of Rs. 2.25 P. per hour has been fixed. During one month, 50 workers were employed and average working days in a month are 25. A worker works for 7 hours in a day. Total wage bill of the factory for the month amounts to Rs. 21,875. There was a stoppage of work due to power failure (idle time) for 100 hours. Calculate various labour variances.

(LCV: Rs.3875 (A), Rate of pay variance: Rs. 2187.50 (A), LEV: Rs.1462.50 (A)

Idle Time Variance: Rs.225 Adverse.)

12. The information regarding the composition and the weekly wage rates of labour force engaged on a job scheduled to be completed in 30 weeks are as follows:

	Standard		Actual	
Category of wokers	No. of workers	Weekly wage rate per worker	No. of workers	Weekly wage rate per worker
		Rs.		Rs.
Skilled	75	60	70	70
Semi skilled	45	40	30	50
Unskilled	60	20	80	20

The work was completed in 32 weeks. Calculate various labour variances.

13. The following data is taken out from the books of a manufacturing concern.

Budgeted labour composition for producing 100 articles

20 Men @ Rs. 1.25 hour for 25 hours

30 women @ 1.10 per hour for 30 hours

Actual labour composition for Producing 100 articles

25 Men @ Rs. 1.50 per hour for 24 hours

25 women @ Re. 1.20 per hour for 25 hours

Calculate: (i) Labour Cost Variance, (ii) Labour Rate Variance, (iii) Labour Efficency Variance, (iv) Labour Mix Variance.

Ans:(Labour Cost Variance: Rs. 35 Adverse, Labour Rate Variacne Rs. 212.50 Adverse, LEV:Rs.177.50 Favourable and LMV: Rs.24.38 unfavourable)

14. Calculate labour variances from the following data:

	Standard	Actual
Out put in units	2,000	2,500

Number of workers employed	50	60
Number of working days in a month	20	22
Average wage per man per month (Rs.)	280	330

Ans: LCV Rs.2300 (A), LRV Rs. 1320 (A), LEV Rs 980 (A)

15. From the following information compute Fixed Overhead Variance, Expenditure Variance, Volume Variance, Capacity Variance, Efficiency Variance.

	Budget	Actual
Fixed overheads for November	Rs. 20,000	20,400
Units of production in November	10,000	10,400
Standard time for 1 unit	= 2 hours	
Actual Hours Worked	=20,100 hours	

Ans: Fixed Overhead Variance: Rs. 300 (A), Expenditure Variance: Rs. 400 (A), Volume Variance: Rs. 100 (F), Capacity Variance: Rs. 800 (F), Efficiency Variance: Rs. 700 (A)

16. From the following information, calculate various overhead variances:

	Budget`	Actual
Output in units	12,000	14,000
Number of working days	20	22
Fixed Overheads	36,000	49,000
Variable Overheads	24,000	35,000

There was an increase of 5% in Capacity.

(Total Overhead cost Variance: Rs.14,000 (A), Variable Overhead Variance: Rs. 7,000 (A), Fixed Overhead Variance: Rs.7000 (A),Expenditure Variance: Rs. 13,000 (A), Volume Variance: Rs.6000 (F), Capacity Variance: Rs.1,800 (F), Calendar Variance: Rs.32,780 (F), Efficiency Variance: Rs.420 (F)

17. Define Standard Costing,. Explains its and merits and demerits.

18. What is Variance Analysis? How does Variance occurs? And why it is adjusted?

19. Briefly explain sales price variance

20. The budgeted and actual sales of a concern manufacturing and marketing a single product are furnished below:

Budgeted sales		10000 units at Rs. 4 per unit.
Actual sales	5000	units at Rs. 3.5 per unit.

Calculate:

(i) Sales price variance

(ii) Sales volume variance

UNIT - IV

LESSON 4.1 FINANCIAL STATEMENT ANAYSIS

Learning Objectives: After studying this lesson you are able to understand:

- The Meaning, Types and Tools of financial analysis.
- Ratio Analysis
- Computation different types of ratios
- Managerial Uses and Limitations of Ratios.

Contents:

- Introduction
- Nature of financial analysis
- Types of financial analysis
- Tools of financial analysis
- Ratio Analysis
- Ratios from shareholders' point of view
- Solved Problems

INTRODUCTION

Financial Statements of an Organization **is like a Horoscope to a human being**. Financial statements by themselves do not give the required information both for internal management and for outsiders. They are passive statements showing the results of the business i.e. profit or loss and the financial position of the business. They will not disclose any reasons for dismal performance of the business if it is so. What is wrong with the business, where it went wrong, why it went wrong, etc. are some of the questions for which no answers will be available in the financial statements. Similarly, no information will be available in the financial statements about the financial strengths and weaknesses of the concern. Hence, to get meaningful information from the financial statements which would facilitate vital decisions to be taken, financial statements must be analysed and interpreted.

Through the analysis and interpretation of financial statements full diagnosis of the profitability and financial soundness of the business is made possible. `Analysis of financial statements' means methodical classification of the data given in the financial statements. `Interpretation of financial statements' means explaining the meaning and significance of the data so classified. A number of tools are available for the purpose of analysing and interpreting the financial statements. This lesson describes the different techniques of financial statement analysis such as Comparative statement analysis, common size statement, trend analysis, and ratio analysis.

NATURE OF FINANCIAL ANALYSIS

The focus of financial analysis is on the key figures contained in the financial statements and the significant relationship that exists between them. "Analyzing financial statements is a process of evaluating the relationship between the component parts of the financial statements to obtain a better understanding of a firm's position and performance".

The type of relationship to be investigated depends upon the objective and purpose of evaluation. The purpose of evaluation of financial statements differs among various groups: creditors, shareholders, potential investors, management and so on. For example, short-term creditors are primarily interested in judging the firm's ability to pay its currently-maturing obligations. The relevant information for them is the composition of the short-term (current) liabilities. The debenture-holders or financial institutions granting long-term loans would be concerned with examining the capital structures, past and projected earnings and changes in the financial position. The shareholders as well as potential investors would naturally be interested in the earnings per share and dividends per share as these factors are likely to have a significant bearing on the market price of shares. The management of the firms, in contrast, analyses the financial statements for self-evaluation and decision making.

The first task of the financial analyst is to select the information relevant to the decision under consideration from the total information contained in the financial statements. The second step involved in financial analysis is to arrange the information in such a way as to highlight significant relationships. The final step is the interpretation and drawing of inferences and conclusions. In brief, financial analysis is the process of selection, relation and evaluation.

TYPES OF FINANCIAL ANALYSIS

Financial analysis may be classified on the basis of parties who are undertaking the analysis and on the basis of methodology of analysis. On the basis of the parties who are doing the analysis, financial analysis is classified into external analysis and internal analysis.

External Analysis: When the parties external to the business like creditors, investors, etc. do the analysis, the analysis is known as external analysis. This analysis is done by them to know the credit-worthiness of the concern, its financial viability, its profitability, etc.

Internal Analysis: This analysis is done by persons who have control over the books of accounts and other information of the concern. Normally this analysis is done by management people to enable them to get relevant information to take vital business decision.

On the basis of methodology adopted for analysis, financial analysis may be either horizontal analysis or vertical analysis.

Horizontal Analysis: When financial statements of a number of years are analysed, then the analysis is known as horizontal analysis. In this type of analysis, figures of the current year are compared with the standard or base year. This type of analysis will give an insight into the concern's performance over a period of years. This analysis is otherwise called as dynamic analysis as it extends over a number of years.

Vertical Analysis: This type of analysis establishes a quantitative relationship of the various items in the financial statements on a particular date. For e.g. the ratios of various expenditure items in terms of sales for a particular year can be calculated. The other name for this analysis is `static analysis' as it relies upon one year figures only.

TOOLS OF FINANCIAL ANALYSIS

The following are the important tools of financial analysis which can be appropriately used by the financial analysts:

1. Common-size financial statements
2. Comparative financial statements

3. Trend percentages

4. Ratio analysis

5. Funds Flow analysis

6. Cash Flow analysis

Common-size Financial Statements: In this type of statements, figures in the original financial statements are converted into percentages in relation to a common base. The common base may be sales in the case of income statements (profit and loss account) and total of assets or liabilities in the case of balance sheet. For e.g. in the case of common-size income statement, sales of the traditional financial statement are taken as 100 and every other item in the income statement is converted into percentages with reference to sales. Similarly, in the case of common-size balance sheet, the total of asset/liability side will be taken as 100 and each individual asset/liability is converted into relevant percentages.

Comparative Financial Statements: This type of financial statements are ideal for carrying out horizontal analysis. Comparative financial statements are so designed to give them perspective to the review and analysis of the various elements of profitability and financial position displayed in such statements. In these statements, figures for two or more periods are compared to find out the changes both in absolute figures and in percentages that have taken place in the latest year as compared to the previous year(s). Comparative financial statements can be prepared both for income statement and balance sheet.

Trend Percentages: Analysis of one year figures or analysis of even two years figures will not reveal the real trend of profitability or financial stability or otherwise of any concern. To get an idea about how consistent is the performance of a concern, figures of a number of years must be analysed and compared. Here comes the role of trend percentages and the analysis which is done with the help of these percentages is called as Trend Analysis.

Trend analysis is a useful tool for the management since it reduces the large amount of absolute data into a simple and easily readable form. The trend analysis is studied by various methods. The most popular forms of trend analysis are year to year trend change percentage and index-number trend series. The year to year trend change percentage would be meaningful and manageable where the trend for a few years, say a five year or six year period is to be analysed.

Generally trend percentage are calculated only for some important items which can be logically related with each other. For e.g. trend ratio for sales, though shows a clear-cut increasing tendency, becomes meaningful in the real sense when it is compared with cost of goods sold which might have increased at a lower level.

Ratio Analysis: Of all the tools of financial analysis available with a financial analyst the most important and the most widely used tool is ratio analysis. Simply stated ratio analysis is an analysis of financial statements done with the help of ratios. A ratio expresses the relationship that exists between two numbers and in financial statement analysis a ratio shows the relationship between two interrelated accounting figures. Both the accounting figures may be taken from the balance sheet and the resulting ratio is called a balance sheet ratio. But if both the figures are taken from profit and loss account then the resulting ratio is called as profit and loss account ratio. Composite ratio is that ratio which is calculated by taking one figure from profit and loss account and the other figure from balance sheet. A detailed discussion on ratio analysis is made available in the pages to come.

Funds Flow Analysis: The purpose of this analysis is to go beyond and behind the information contained in the financial statements. Income statement tells the quantum of profit earned or loss suffered for a particular accounting year. Balance sheet gives the assets and liabilities position as on a particular date. But in an accounting year a number of financial transactions take place which have a bearing on the performance of the concern but which are not revealed by the financial statements. For e.g. a concern collects finance through various sources and uses them for various purposes. But these details could not be known from the traditional financial statements. Funds flow analysis gives an opening in this respect. All the more, funds flow analysis reveals the changes in working capital position. If there is an increase in working capital what resulted in the increase and if there is a decrease in working capital what caused the decrease, etc. will be made available through funds flow analysis.

Cash Flow Analysis: While funds flow analysis studies the reasons for the changes in working capital by analysing the sources and application of funds, cash flow analysis pays attention to the changes in cash position that has taken place between two accounting periods. These reasons are not available in the traditional financial statements. Changes in the cash position can be analysed with the help of a statement known as cash flow statement. A cash flow statement summarises the

change in cash position of the concern. Transactions which increase the cash position of the concern are labelled as `inflows' of cash and those which decrease the cash position as `outflows' of cash.

Ratio Analysis

Ratio means expressing one variable in terms of another variable. It depicts the numerical relationship between two numbers. Kennedy and McMullen defines it as , "The relationship of one item to another expressed in simple mathematical form is known as a ratio". Thus, the ratio is a measuring device to judge the growth, development and present condition of a concern. It plays an important role in measuring the comparative significance of the income and position statement. Accounting ratios are expressed in the form of time, proportion, percentage, or per one rupee. Ratio analysis is not only a technique to point out relationship between two figures but also points out the devices to measure the fundamental strengths or weaknesses of a concern. James C.Van Horne observes: "To evaluate the financial condition and performance of a firm, the financial analyst needs certain yardsticks. One of the yardsticks frequently used is a ratio. The main purpose of ratio analysis is to measure past performance and project future trends. It is also used for inter-firm and intra-firm comparison as a measure of comparative productivity. The significance of the various components of financial statements can be judged only by ratio analysis. The financial analyst X-Rays the financial conditions of a concern by the use of various ratios and if the conditions are not found to be favourable, suitable steps can be taken to overcome the limitations. The main objectives of ratio analysis are:

(i) to simplify the comparative picture of financial statements.

(ii) to assist the management in decision making.

(iii) to guage the profitability, solvency and efficiency of an enterprise, and

(iv) to ascertain the rate and direction of change and future potentiality.

CLASSIFICATION OF RATIOS

Financial ratios may be categorised in various ways. Van Horne has divided financial ratios into four categories, viz., liquidity, debt, profitability and coverage ratios. The first two types of ratios are computed from the balance sheet. The last two are computed from the income statement and sometimes, from both the statements. For the purpose of analysis, the present lesson gives a detailed description of ratios, the formula used for their computation and their significance. The ratios have been categorised under the following headings:-

(i) Ratios for analysis of Capital Structure or Leverage.

(ii) Ratios for Fixed Assets Analysis.

(iii) Ratios for Analysis of Turnover.

(iv) Ratios for Analysis of Liquidity Position.

(v) Ratios for Analysis of Profitability.

(vi) Ratios for Analysis of Operational Efficiency.

LEVERAGE RATIOS

Financial strength indicates the soundness of the financial resources of an organisation to perform its operations in the long run. The parties associated with the organisation are interested in knowing the financial strength of the organisation. Financial strength is directly associated with the operational ability of the organisation and its efficient management of resources. The financial strength analysis can be made with the help of the following ratios:

(1) Debt-Equity Ratio

(2) Capital Gearing Ratio

(3) Financial Leverage

(4) Proprietary Ratio and

(5) Interest Coverage.

Debt-Equity Ratio: The debt-equity ratio is determined to ascertain the soundness of the long-term financial policies of the company. This ratio indicates the proportion between the shareholders'

funds (i.e. tangible net worth) and the total borrowed funds. Ideal ratio is 1. In other words, the investor may take debt equity ratio as quite satisfactory if shareholders' funds are equal to borrowed funds. However, creditors would prefer a low debt-equity ratio as they are much concerned about the security of their investment. This ratio can be calculated by dividing the total debt by shareholders' equity. For the purpose of calculation of this ratio, the term shareholders' equity includes share capital, reserves and surplus and borrowed funds which includes both long-term funds and short-term funds.

$$\text{DEBT-EQUITY RATIO} = \frac{\text{Debt}}{\text{Equity}}$$

A high ratio indicates that the claims of creditors are higher as compared to owners' funds and a low debt-equity ratio may result in a higher claim of equity.

Capital Gearing Ratio: This ratio establishes the relationship between the fixed interest-bearing securities and equity shares of a company. It is calculated as follows:

$$\text{Capital Gearing Ratio} = \frac{\text{Fixed Interest-bearing securities}}{\text{Equity Shareholders' Funds}}$$

Fixed-interest bearing securities carry with them the fixed rate of dividend or interest and include preference share capital and debentures. A firm is said to be highly geared if the lion's share of the total capital is in the form of fixed interest-bearing securities or this ratio is more than one. If this ratio is less than one, it is said to be low geared. If it is exactly one, it is evenly geared. This ratio must be carefully planned as it affects the firm's capacity to maintain a uniform dividend policy during difficult trading periods that may occur. Too much capital should not be raised by way of debentures, because debentures do not share in business losses.

Financial Leverage Ratio: Financial leverage results from the presence of fixed financial charges in the firm's income stream. These fixed charges do not vary with the earnings before interest and tax (EBIT) or operating profits. They have to be paid regardless of the amount of earnings before interest and taxes available to pay them. After paying them, the operating profits (EBIT) belong to

the ordinary shareholders. Financial leverage is concerned with the effects of changes in earnings before interest and taxes on the earnings available to equity holders. It is defined as the *ability of a firm to use fixed financial charges to magnify the effects of changes in EBIT on the firm's earning per share*. Financial leverage and trading on equity are synonymous terms. The EBIT is calculated by adding back the interest (interest on loan capital + interest on long term loans + interest on other loans) and taxes to the amount of net profit. Financial leverage ratio is calculated by dividing EBIT by EBT (earnings before tax). Neither a very high leverage nor a very low leverage represents a sound picture (EBIT ÷ EBT).

Proprietary Ratio: This ratio establishes the relationship between the proprietors' funds and the total tangible assets. The general financial strength of a firm can be understood from this ratio. The ratio is of particular importance to the creditors who can find out the proportion of shareholders' funds in the capital assets employed in the business. A high ratio shows that a concern is less dependent on outside funds for capital. A high ratio suggests sound financial strength of a firm due to greater margin of owners' funds against outside sources of finance and a greater margin of safety for the creditors. A low ratio indicates a small amount of owners' funds to finance total assets and more dependence on outside funds for working capital. In the form of formula this ratio can be expressed as:-

$$\text{Proprietary Ratio} = \frac{\text{Net Worth}}{\text{Total Assets}}$$

Interest Coverage: This ratio measures the debt servicing capacity of a firm in so far as fixed interest on long-term loan is concerned. It is determined by dividing the operating profits or earnings before interest and taxes (EBIT) by the fixed interest charges on loans. Thus,

$$\text{Interest Coverage} = \frac{\text{EBIT}}{\text{Interest}}$$

It should be noted that this ratio uses the concept of net profits before taxes because interest is tax-deductible so that tax is calculated after paying interest on long-term loans. This ratio, as the name suggests, shows how many times the interest charges are covered by the EBIT out of which they will be paid. In other words, it indicates the extent to which a fall in EBIT is tolerable in the sense that the ability of the firm to service its debts would not be adversely affected. From the point of view of creditors, the larger the coverage, the greater the ability of the firm to handle fixed-charge

liabilities and the more assured the payment of interest to the creditors. However, too high a ratio may imply unused debt capacity. In contrast, a low ratio is danger signal that the firm is using excessive debt and does not have the ability to offer assured payment of interest to the creditors.

Fixed Asset Analysis

The successful operation of a business generally requires some assets of fixed character. These assets are used primarily in producing goods and in operating the business. With the help of these, raw materials are converted into finished products. Fixed assets are not meant for sale and are kept as a rule permanently in the business in order to carry on day-to-day operations.

Analysis of fixed assets is very important from investors' point of view because investors are more concerned with long term assets. Fixed assets are properties of non-current nature which are acquired to provide facilities to carry on business. They include land, building, equipment, furniture, etc. They are generally shown in balance sheet by aggregating them into groups of gross block as reduced by the accumulated amount of depreciation till date. Investment in fixed assets is of a permanent nature and therefore should be financed by owners' funds (permanent sources of funds). The owners' funds should be sufficient to provide for fixed assets. Fixed assets are generally financed by owners' equity and long-term borrowings. The long-term borrowings are in the form of long-term loans and of almost permanent nature. Under such a situation it becomes more or less irrelevant to relate the fixed assets with only the owners' equity. Therefore, the analysis of the source of financing of fixed assets has been done with the help of the following ratios:-

(a) Fixed Assets to Net Worth

(b) Fixed Assets to Long-term Funds

Fixed Assets to Net Worth: In the words of Anil B.Roy Choudhary, "this ratio indicates the relationship between Net Worth (i.e. shareholders' funds) and investments in net fixed assets (i.e. Gross Block minus depreciation)".

The higher the ratio the lesser would be the protection to creditors. If the ratio is less than 1, it indicates that the net worth exceeds fixed assets. It will further indicate that the working capital is

partly financed by shareholders' funds. If the ratio exceeds 1, it would mean that part of the fixed assets has been provided by creditors. The formula for derivation of this ratio is:-

$$\text{Fixed Assets to Net Worth Ratio} = \frac{\text{Net Fixed Assets}}{\text{Net Worth}}$$

Fixed Assets to Long-term Funds: This ratio establishes the relationship

between the fixed assets and long-term funds and it is obtained by the formula:

$$\text{FIXED ASSET RATIO} = \frac{\text{Fixed Assets}}{\text{Long-term Funds}}$$

The ratio should be less than one. If it is less than one, it shows that a part of the working capital has been financed through long-term funds. This is desirable because a part of working capital termed as "core working capital" is more or less of a fixed nature. The ideal ratio is 0.67.

If this ratio is more than one, it indicates that a part of current liability is invested in long-term assets. This is a dangerous position. Fixed assets include "net fixed assets" i.e. original cost less depreciation to date and trade investments including shares in subsidiaries. Long-term funds include share capital, reserves and long-term borrowings.

Efficiency Ratios

Turnover ratios also referred to as Activity Ratios are concerned with measuring the efficiency in asset management. Sometimes, these ratios are also called as efficiency ratios or asset utilisation ratios. The efficiency with which the assets are used would be reflected in the speed and rapidity with which assets are converted into sales. The greater the rate of turnover or conversion, the more efficient the utilization/management, other things being equal. For this reason such ratios are also designated as turnover ratios. Turnover is the primary mode for measuring the extent of efficient employment of assets by relating the assets to sales. An activity ratio may, therefore, be defined as a test of the relationship between sales (more appropriately with cost of sales) and the various assets of a firm. Depending upon the various types of assets, there are various types of activity ratios. Some of the more widely used turnover ratios are:-

(1) Fixed Assets Turnover Ratio

(2) Current Assets Turnover Ratio

(3) Working Assets Turnover Ratio

(4) Inventory (or stock) Turnover Ratio

(5) Debtors Turnover Ratio

(6) Creditors Turnover Ratio

Fixed Assets Turnover Ratio: The Fixed Assets Turnover Ratio measures the efficiency with which the firm is utilising its investment in fixed assets, such as land, building, plant and machinery, furniture, etc. It also indicates the adequacy of sales in relation to investment in fixed assets. *The fixed assets turnover ratio is sales divided by the net fixed assets (i.e., the depreciated value of fixed assets).*

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Sales}}{\text{Net Fixed Assets}}$$

The turnover of fixed assets can provide a good indicator for judging the efficiency with which fixed assets are utilised in the firm. A high fixed assets turnover ratio indicates efficient utilisation of fixed assets in generating operating revenue. A low ratio signifies idle capacity, inefficient utilisation and management of fixed assets.

Current Assets Turnover Ratio: The current assets turnover ratio ascertains the efficiency with which current assets are used in a business. Professor Guthmann observes that "*current assets turnover is to give an overall impression of how rapidly the total investment in current assets is being turned*". This ratio is strongly associated with efficient utilisation of costs, receivables and inventory. A higher value of this ratio indicates greater circulation of current assets while a low ratio indicates a stagnation of the flow of current assets. The formula for the computation of current assets turnover ratio is:

$$\text{Current Assets Turnover Ratio} = \frac{\text{Sales}}{\text{Current Assets}}$$

Working Capital Turnover Ratio: This ratio shows the number of times working capital is turned-over in a stated period. Working capital turnover ratio reflects the extent to which a business is

operating on a small amount of working capital in relation to sales. The ratio is calculated by the following formula:-

$$\text{Working Capital Turnover Ratio} = \frac{\text{Sales}}{\text{Net Working Capital}}$$

The higher the ratio, the lower is the investment in working capital and greater are the profits. However, a very high turnover of working capital is a sign of over trading and may put the firm into financial difficulties. On the other hand, a low working capital turnover ratio indicates that working capital is not efficiently utilised.

Inventory Turnover Ratio: The inventory turnover ratio, also known as stock turnover ratio normally establishes the relationship between cost of goods sold and average inventory. This ratio indicates whether investment in inventory is within proper limit or not. In the words of S.C.Kuchal, "*this relationship expresses the frequency with which average level of inventory investment is turned over through operations*". The formula for the computation of this ratio may be expressed thus:

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

In general, a high inventory turnover ratio is better than a low ratio. A high ratio implies good inventory management. A very high ratio indicates under-investment in, or very low level of inventory which results in the firm being out of stock and incurring high stock-out cost. A very low inventory turnover ratio is dangerous. It signifies excessive inventory or over-investment in inventory. A very low ratio may be the results of inferior quality goods, over-valuation of closing inventory, stock of unsaleable/obsolete goods.

Debtors Turnover Ratio and Collection Period: One of the major activity ratios is the receivables or debtors turnover ratio. Allied and closely related to this is the average collection period. It shows how quickly receivables or debtors are converted into cash. In other words, the debtors turnover ratio is a test of the liquidity of the debtors of a firm. The liquidity of a firm's receivables can be examined in two ways: (i) debtors/receivables turnover and (ii) average collection period. The debtors turnover shows the relationship between credit sales and debtors of a firm. Thus,

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

Net credit sales consists of gross credit sales minus returns if any, from the customers. Average debtors is the simple average of debtors at the beginning and at the end of the year.

The second type of ratio measuring the liquidity of a firm's debtors is the average collection period. This ratio is, in fact, interrelated with and dependent upon, the receivables turnover ratio. It is calculated by dividing the days in a year by the debtors turnover. Thus,

$$\text{Average Collection Period} = \frac{\text{Days in year}}{\text{Debtors turnover}}$$

This ratio indicates the speed with which debtors/accounts receivables are being collected. The higher the turnover ratio and shorter the average collection period, the better the trade credit management and better the liquidity of debtors. On the other hand, low turnover ratio and long collection period reflects that payments by debtors are delayed. In general, short collection period (high turnover ratio) is preferable.

Creditors' Turnover Ratio and Debt Payment Period: Creditors' turnover ratio indicates the speed with which the payments for credit purchases are made to the creditors. This ratio can be computed as follows:-

$$\text{Creditors' Turnover Ratio} = \frac{\text{Average Accounts Payable}}{\text{Net Credit Purchases}}$$

The term accounts payable include trade creditors and bills payable. A high ratio indicates that creditors are not paid in time while a low ratio gives an idea that the business is not taking full advantage of credit period allowed by the creditors.

Sometimes, it is also required to calculate the average payment period or average age of payables or debt period enjoyed to indicate the speed with which payments for credit purchases are made to creditors. It is calculated as:

$$\text{Average age of payables} = \frac{\text{Days in a year}}{\text{Creditors' Turnover Ratio}}$$

Both the creditors' turnover ratio and the debt payment period enjoyed ratio indicate about the promptness or otherwise in making payment for credit purchases. A higher creditors' turnover ratio or lower credit period enjoyed ratio signifies that the creditors are being paid promptly.

Anaysis of Liquidity Position

The liquidity ratios measure the ability of a firm to meet its short- term obligations and reflect the short-term financial strength/solvency of a firm. *The term liquidity is described as convertibility of assets ultimately into cash in the course of normal business operations and the maintenance of a regular cash flow. A sound liquid position is of primary concern to management from the point of view of meeting current liabilities as and when they mature as well as for assuring continuity of operations*. Liquidity position of a firm depends upon the amount invested in current assets and the nature of current assets. The under mentioned ratios are used to measure the liquidity position:-

(1) Current Ratio

(2) Liquid (or) Quick Ratio

(3) Cash to Current Assets Ratio

(4) Cash to Working Capital Ratio

Current Ratio: The most widely used measure of liquid position of an enterprise is the current ratio, i.e., the ratio of the firm's current assets to current liabilities. It is calculated by dividing current assets by current liabilities:

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

The current assets of a firm represent those assets which can be in the ordinary course of business, converted into cash within a short period of time, normally not exceeding one year and include cash and bank balance, marketable securities, inventory of raw materials, semi-finished (work-in-progress) and finished goods, debtors net of provision for bad and doubtful debts, bills receivable and pre-paid expenses. The current liabilities defined as liabilities which are short-term maturing obligations to be met, as originally contemplated, within a year, consist of trade creditors, bills

payable, bank credit, provision for taxation, dividends payable and outstanding expenses. N.L.Hingorani and others observe: "*Current Ratio is a tool for measuring the short-term stability or ability of the company to carry on its day-to-day work and meet the short-term commitments earlier*". Generally 2:1 is considered ideal for a concern i.e., current assets should be twice of the current liabilities. If the current assets are two times of the current liabilities, there will be no adverse effect on business operations when the payment of current liabilities is made. If the ratio is less than 2, difficulty may be experienced in the payment of current liabilities and day-to-day operations of the business may suffer. If the ratio is higher than 2, it is very comfortable for the creditors but, for the concern, it indicates idle funds and lack of enthusiasm for work.

Liquid (or) Quick Ratio: Liquid (or) Quick ratio is a measurement of a firm's ability to convert its current assets quickly into cash in order to meet its current liabilities. It is a measure of judging the immediate ability of the firm to pay-off its current obligations. It is calculated by dividing the quick assets by current liabilities:

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

The term quick assets refers to current assets which can be converted into cash immediately or at a short notice without diminution of value. Thus quick assets consists of cash, marketable securities and accounts receivable. Inventories are excluded from quick assets because they are slower to convert into cash and generally exhibit more uncertainty as to the conversion price.

This ratio provides a more stringent test of solvency. 1:1 ratio is considered ideal ratio for a firm because it is wise to keep the liquid assets atleast equal to the current liabilities at all times.

Cash to Current Assets Ratio: Efficient management of the inflow and outflow of cash plays a crucial role in the overall performance of a business. Cash is the most liquid form of assets which safeguards the security interest of a business. Cash including bank balances plays a vital role in the total net working capital. The ratio of cash to working capital signifies the proportion of cash to the total net working capital and can be calculated by dividing the cash including bank balance by the working capital. Thus,

$$\text{Cash to Working Capital Ratio} = \frac{\text{Cash}}{\text{Working Capital}}$$

Cash is not an end in itself, it is a means to achieve the end. Therefore, only a required amount of cash is necessary to meet day-to-day operations. A higher proportion of cash may lead to shrinkage of profits due to idleness of resources of a firm.

Profitability Analysis

Profitability is a measure of efficiency and control. It indicates the efficiency or effectiveness with which the operations of the business are carried on. Poor operational performance may result in poor sales and therefore low profits. Low profitability may be due to lack of control over expenses resulting in low profits. Profitability ratios are employed by management in order to assess how efficiently they carry on business operations. Profitability is the main base for liquidity as well as solvency. Creditors, banks and financial institutions are interested in profitability ratios since they indicate liquidity or capacity of the business to meet interest obligations and regular and improved profits enhance the long term solvency position of the business. Owners are interested in profitability for they indicate the growth and also the rate of return on their investments. The importance of measuring profitability has been stressed by Hingorani, Ramanathan and Grewal in these words: "*A measure of profitability is the overall measure of efficiency*".

An appraisal of the financial position of any enterprise is incomplete unless its overall profitability is measured in relation to the sales, assets, capital employed, net worth and earnings per share. The following ratios are used to measure the profitability position from various angles:

(1) Gross Profit Ratio

(2) Net Profit Ratio

(3) Return on Capital Employed

(4) Operating Ratio

(5) Operating Profit Ratio

(6) Return on Owners' Equity

(7) Earnings Per Share

(8) Dividend Pay Out Ratio

Gross Profit Ratio: The Gross Profit Ratio or Gross Profit Margin Ratio expresses the relationship of gross profit on sales / net sales. B.R.Rao opines that "*gross profit margin ratio indicates the gross margin of profits on the net sales and from this margin only, all expenses are met and finally net income emerges*". The basic components for the computation of this ratio are gross profits and net sales. `Net Sales' means total sales minus sales returns and `gross profit' means the difference between net sales and cost of goods sold. The formula used to compute Gross Profit Ratio is:

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

Gross profit ratio indicates to what extent the selling prices of goods per unit may be reduced without incurring losses on operations. A low gross profit ratio will suggest decline in business which may be due to insufficient sales, higher cost of production with the existing or reduced selling price or the all-round inefficient management. A high gross profit ratio is a sign of good and effective management.

Net Profit Ratio: Net profit is a good indicator of the efficiency of a firm. Net profit ratio or net profit margin ratio is determined by relating net income after taxes to net sales. Net profit here is the balance of profit and loss account which is arrived at after considering all non-operating incomes such as interest on investments, dividends received, etc. and non-operating expenses like loss on sale of investments, provisions for contingent liabilities, etc. This ratio indicates net margin earned on a sale of Rs.100. The formula for calculating the ratio is:

$$\text{Net Profit Ratio} = \frac{\text{Net Profit}}{\text{Sales}} \times 100$$

This ratio is widely used as a measure of overall profitability and is very useful for proprietors. A higher ratio indicates better position.

Return on Capital Employed: The prime objective of making investments in any business is to obtain satisfactory return on capital invested. Hence, the return on capital employed is used as a measure of success of a business in realising this objective. Otherwise known as Return on Investments, this is the overall profitability ratio. It indicates the percentage of return on capital employed in the business and it can be used to show the efficiency of the business as a whole. The formula for calculating the ratio is:

$$\text{Return on Capital Employed} = \frac{\text{Operating Profit}}{\text{Capital Employed}} \times 100$$

The term "Capital Employed" means [Share capital + Reserves and Surplus + Long Term Loans] minus [Non-business assets + Fictitious assets] and the term "Operating Profit" means profit before interest and tax. The term `interest' means interest on long-term borrowings. Non-trading income should be excluded for the above purpose. A higher ratio indicates that the funds are invested profitably.

Operating Ratio: This ratio establishes the relationship between total operating expenses and sales. Total operating expenses includes cost of goods sold plus other operating expenses. A higher ratio indicates that operating expenses are high and the profit margin is less and therefore lower the ratio, better is the position. The operating ratio is an index of the efficiency of the conduct of business operations. An ideal norm for this ratio is between 75% to 85% in a manufacturing concern. The formula for calculating the operating ratio is thus:

$$\text{Operating Ratio} = \frac{\text{Cost of goods sold + Operating experience}}{\text{Sales}} \times 100$$

Operating Profit Ratio: This ratio indicates net-margin earned on a sale of Rs.100. It is calculated as follows:

$$\text{Operating Profit Ratio} = \frac{\text{Net Operating Profit}}{\text{Sales}} \times 100$$

The operating profit ratio helps in determining the efficiency with which affairs of the business are being managed. An increase in the ratio over the previous period indicates improvement in the operational efficiency of the business provided the gross profit ratio is constant. Operating profit is estimated without considering non-operating income such as profit on sale of fixed assets,

interest on investments and non-operating expenses such as loss on sale of fixed assets. This is thus, an effective tool to measure the profitability of a business concern.

Return on Owners' Equity (or) Shareholders' Fund (or) the Net Worth:

The ratio of return on owners' equity is a valuable measure for judging the profitability of an organisation. This ratio helps the shareholders of a firm to know the return on investment in terms of profits. Shareholders are always interested in knowing as to what return they earned on their invested capital since they bear all the risk, participate in management and are entitled to all the profits remaining after all outside claims including preference dividend are met in full. This ratio is computed as a percentage by using the formula:

$$\text{Return on Owners' Equity} = \frac{\text{Net Profit after interest and tax}}{\text{Owners' Equity (Net Worth)}} \times 100$$

This is the single most important ratio to judge whether the firm has earned a satisfactory return for its equity-shareholders or not. A higher ratio indicates the better utilisation of owners' fund and higher productivity. A low ratio may indicate that the business is not very successful because of inefficient and ineffective management and over investment in assets.

Earnings Per Share (EPS): The profitability of a firm from the point of view of the ordinary shareholders is analysed through the ratio `EPS'. It measures the profit available to the equity shareholders on a per share basis, i.e. the amount that they can get on every share held. It is calculated by dividing the profits available to the shareholders by the number of the outstanding shares. The profits available to the ordinary shareholders are represented by net profit after taxes and preference dividend.

$$\text{Earnings Per Share} = \frac{\text{Net profit after tax} - \text{Preference Dividend}}{\text{Number of Equity Shares}}$$

This ratio is an important index because it indicates whether the wealth of each shareholder on a per-share basis has changed over the period. The performance and prospects of the firm are affected by EPS. If EPS increases, there is a possibility that the company may pay more dividend or issue bonus shares. In short, the market price of the share of a firm will be affected by all these factors.

Dividend Pay Out Ratio: This ratio measures the relationship between the earnings belonging to the ordinary shareholders and the dividend paid to them. In other words, the dividend pay out ratio shows what percentage share of the net profits after taxes and preference dividend is paid out as dividend to the equity shareholders. It can be calculated by dividing the total dividend paid to the owners by the earnings available to them. The formula for computing this ratio is:

$$\text{Dividend payout ratio} = \frac{\text{Dividend per equity share}}{\text{Earnings per share}}$$

This ratio is very important from shareholder's point of view as its tells him that if a firm has used whole, or substantially the whole of its earnings for paying dividend and retained nothing for future growth and expansion purposes, then there will be very dim chances of capital appreciation in the price of shares of such firms. In other words, an investor who is more interested in capital appreciation must look for a firm having low payout ratio.

Analysis of Operational Efficiency

The operational efficiency of an organisation is its ability to utilise the available resources to the maximum extent. Success or failure of a business in the economic sense is judged in relation to expectations, returns on invested capital and objectives of the business concern. There are many techniques available for evaluating financial as well as operational performance of a firm. The two important techniques adopted in this study are:

1. Turnover to Capital Employed or Return on Investment (ROI)

2. Financial Operations Ratio

Turnover to Capital Employed: This is the ratio of operating revenue to capital employed. This is one of the important ratios to find out the efficiency with which the firms are utilising their capital. It signifies the number of times the total capital employed was turned into sales volumes. The term capital employed includes total assets minus current liabilities. The ratio for calculating turnover to capital employed (in percentage) is:

$$\text{Turnover to capital employed} = \frac{\text{Operating Revenue}}{\text{Capital Employed}} \times 100$$

The higher the ratio, the better is the position.

Financial Operations Ratio: The efficiency of the financial management of a firm is calculated through financial operations ratio. This ratio is a calculating device of the cost and the return of financial charges. This ratio signifies a relationship between net profit after tax and operating profit. The formula for the computation of this ratio is:

$$\text{Financial Operations Ratio} = \frac{\text{Net Profit after tax}}{\text{Operating Profit}} \times 100$$

Here, the term "operating profit" means sales minus operating expenses. A higher ratio indicates the better financial performance of the firm.

RATIOS FROM SHAREHOLDERS' POINT OF VIEW

1. Preference Dividend Cover: This ratio expresses Net Profit after tax as so many times of Preference Dividend Payable. This is calculated as:

$$\frac{\text{Net Profit after tax}}{\text{Preference Dividend}}$$

2. Equity Dividend Cover: This ratio gives information about net profit available to equity shareholders. This ratio expresses profit as number of times of equity dividend payable. This ratio is calculated using the following formula:

$$\frac{\text{Net Profit After Tax} - \text{Preference Dividend}}{\text{Equity Dividend}}$$

3. Dividend Yield on Equity Shares or Yield Ratio: This ratio interprets dividend as a percentage of Market Price Per Share. It is calculated as:

$$\frac{\text{Dividend Per Share}}{\text{Market Price Per Share}} \times 100$$

4. Price Earning Ratio: This ratio tells how many times of earnings per share is the market price of the share of a company. The formula to calculate this ratio is:

$$\frac{\text{Market Price Per Share}}{\text{Earnings Per Share}}$$

Solved Problems

Problem 1: The following are the financial statements of Parveen Limited for the year 2009.

BALANCE SHEET AS AT 31-12-2009

	Rs.		Rs.
Equity Share capital	1,00,000	Fixed Assets	1,50,000
General Reserve	90,000	Stock	42,500
Profit & Loss Balance	7,500	Debtors	19,000
Sundry Creditors	35,000	Cash	61,000
6% Debentures	30,000	Proposed Dividends	10,000
	2,72,500		2,72,500

TRADING AND PROFIT AND LOSS ACCOUNT
for the year ended 31-12-2009

	Rs.		Rs.
To Cost of goods sold	1,80,000	By Sales	3,00,000
To Gross profit c/d	1,20,000		
	3,00,000		3,00,000
To expenses	1,00,000	By Gross profit b/d	1,20,000
To Net Profit	20,000		
	1,20,000		1,20,000

You are required to compute the following:
1) Current ratio
2) Acid Test ratio
3) Gross Profit ratio
4) Debtors' Turnover ratio
5) Fixed Assets to net tangible worth
6) Turnover to fixed assets

Solution:

1) Current Ratio $= \dfrac{\text{Current Assets}}{\text{Current Liabilities}}$

$= \dfrac{1,22,500}{45,000} = 2.7:1.$

2) Acid Test Ratio $= \dfrac{\text{Quick Assets}}{\text{Quick Liabilities}}$

$= \dfrac{80,000}{45,000} = 1.8:1.$

$$3)\ \text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

$$= \frac{1,20,000}{3,00,000} \times 100 = 40\%$$

$$4)\ \text{Debtors' Turnover Ratio} = \frac{\text{Net Sales}}{\text{Average Debtors}}$$

$$= \frac{3,00,000}{19,000} = 15.78 \text{ times.}$$

$$\text{Collection Period} = \frac{\text{No. of days in the year}}{\text{Debtors' Turnover}}$$

$$= \frac{365}{15.78} = 23 \text{ days}$$

$$5)\ \text{Fixed Asset to Net Tangible Worth} = \frac{\text{Fixed Assets}}{\text{Proprietor's Fund}} \times 100$$

$$= \frac{1,50,000}{1,97,500} \times 100 = 76\%$$

$$6)\ \text{Turnover to Fixed Assets} = \frac{\text{Net Sales}}{\text{Fixed Assets}}$$

$$= \frac{3,00,000}{1,50,000} = 2 \text{ times}$$

Problem 2: From the following details prepare a statement of proprietary fund with as many details as possible.

1) Stock Velocity 6

2) Capital Turnover Ratio 2

3) Fixed Assets Turnover Ratio 4

4) Gross Profit Turnover Ratio 20%

5) Debtors' Velocity 2 months

6) Creditors' Velocity 73 days

Gross profit was Rs.60,000. Reserves and surplus amount to 20,000. Closing stock was Rs.5,000 in excess of opening stock.

Solution:

1. Calculation of Sales

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100 = 20\%$$

$$\frac{\text{Rs.60,000}}{\text{Sales}} = \frac{20}{100}$$

$$= \frac{1}{5}$$

Sales: Rs.3,00,000

2. Calculation of Sundry Debtors

$$\text{Debtors' Velocity} = \frac{\text{Debtors}}{\text{Sales}} \times 12 \text{ months}$$

Let Debtors be x

$$2 = \frac{x}{3,00,000} \times 12$$

$$\frac{x}{3,00,000} = \frac{1}{6}$$

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

Debtors: Rs.50,000

It is assumed that all sales are credit sales.

*3. **Calculation of Stock***

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average stock}} = 6$$

Cost of goods sold = Sales – Gross Profit

= Rs.3,00,000 – Rs.60,000

= Rs.2,40,000

$$\frac{\text{Rs.2,40,000}}{\text{Average Stock}} = 6$$

$$\text{Average Stock} = \frac{\text{Rs.2,40,000}}{6} = \text{Rs.40,000}$$

Opening stock + Closing stock

Average Stock = ----------
2

Let opening stock be Rs.x.

Then closing stock will be x + 5,000

x + x + 5,000
---------- = 40,000
2

2x + 5,000
---------- = 40,000
2

Cross multiplying

2x + 5,000 = 80,000
2x = 80,000 – 5,000
= 75,000
x = 37,500

4. Calculation of Creditors

Creditors' velocity days = Total Creditors / Credit Purchases x 365
= 73 days

Purchase = Cost of goods + Closing Stock – Opening stock
= Rs.2,40,000 + 42,500 – 37,500
= Rs.2,45,000

Let the creditors be x

x
---------- x 365 = 73
2,45,000

365 x = 2,45,000 x 73

x = (2,45,000 x 73) / 365

Creditors = Rs.49,000

5. Calculation of Fixed Assets

Fixed Assets Turnover Ratio = Costs of goods sold / Fixed Assets = 4

Let Fixed assets be x

2,40,000
---------- = 4
x

x = 60,000

Fixed Assets = Rs.60,000

6. Shareholders' Fund

$$\text{Capital Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Proprietary Fund}} = 2$$

$$\frac{2,40,000}{\text{Proprietary Fund}} = 2$$

Proprietary Fund = Rs.1,20,000
Shareholders' fund includes Share capital, Profit & Reserve.
Share Capital = Shareholders' Fund – (Profit + Reserve)
= Rs.1,20,000 – Rs.80,000
= Rs.40,000

7. Calculation of Bank Balance

Shareholders' Fund + Current Liabilities = Fixed Assets + Current Assets
Rs.1,20,000 + 49,000 = Rs.60,000 + Current Assets
Current Assets = Rs.1,09,000
Current Assets = Stock + Debtors + Bank
Bank Balance = Current Assets – (Stock + Debtors)
= Rs.1,09,000– (42,500 + 50,000)
= Rs.1,09,000 – 92,500
= Rs.16,500

Balance Sheet as on …

Liabilities	Rs.	Assets		Rs.
Share capital	40,000	Fixed Assets	60,000	
Reserves & Surplus	20,000	Current Assets:		
Profit	60,000	Stock	42,500	
Current liabilities	49,000	Debtors	50,000	
		Bank		16,500
				1,09,000
	1,69,000			1,69,000

Problem 3: The following data is furnished:

a) Working capital Rs.45,000

b) Current ratio 2.5

c) Liquidity ratio 1.5

d) Proprietary ratio – (Fixed assets to proprietary funds) 0.75

e) Overdraft Rs.10,000

f) Retained earnings Rs.30,000

There are no long term loans and fictitious assets.

Find out:

1) Current assets

2) Current liabilities

3) Fixed assets

4) Quick assets

5) Quick liabilities

6) Stock

7) Equity

Solution:

Current Assets

Current assets 2.5

Current liability 1.0

Working capital 1.5

If working capital is 1.5, current asset will be 2.5.

If working capital is Rs.45,000, current assets will be Rs.75,000

Current Assets = Rs.75,000

Current Liability

Current Liability = Current assets – Working capital

= Rs.75,000 – Rs.45,000

= Rs.30,000

Fixed Assets

Shareholders' Fund+ Current Liabilities = Fixed Assets + Current Assets

Shareholders' Fund=Fixed assets + Current assets – Current Liabilities

= Fixed assets + Rs.75,000 – Rs.30,000

= Fixed assets + Rs.45,000

Let the shareholders' fund be x, fixed assets will be ¾ x

x = Rs. ¾ x + Rs.45,000

¼ x = Rs.45,000

x = Rs.1,80,000

¾ x = Rs.1,35,000

Fixed assets = Rs.1,35,000

Shareholders Funds = Rs.1,35,000 + Rs.45,000

= Rs.1,80,000

Stock

$$\text{Liquid ratio} = \frac{\text{Quick assets}}{\text{Quick liabilities}}$$

Quick assets = Current assets – Stock

Quick liabilities = Current liabilities – Bank overdraft

Let the value of stock be x.

$$\frac{\text{Quick assets}}{\text{Quick liabilities}} = \frac{\text{Rs.75,000} - x}{\text{30,000} - \text{10,000}}$$

$$= \frac{75{,}000 - x}{20{,}000} = 1.5$$

Cross multiplying

75,000 – x	=	20,000 x 1.5
75,000 – x	=	30,000
x	=	45,000
Stock	=	Rs.45,000

Quick Assets = Rs.75,000 – Rs.45,000

= Rs.30,000

Quick Liabilities = Rs.20,000

Equity

Shareholders' Fund = Equity + Retained earnings

Shareholders' Fund = Rs.1,80,000 (as calculated)

Retained earnings = Rs.30,000 (as given)

Equity = Rs.1,50,000

Problem 4: From the following balance sheet of Dinesh Limited calculate (i) Current ratio (ii) Liquid ratio (iii) Debt-equity ratio (iv) Proprietary ratio, and (v) Capital gearing ratio.

Balance Sheet of Dinesh Limited as on 31-12-2005

Liabilities	Rs.	Assets	Rs.
Equity share capital	10,00,000	Goodwill	5,00,000
6% preference capital	5,00,000	Plant & Machinery	6,00,000
Reserves	1,00,000	Land & Buildings	7,00,000
Profit & Loss a/c	4,00,000	Furniture	1,00,000
Tax provision	1,76,000	Stock	6,00,000
Bills payable	1,24,000	Bills receivables	30,000
Bank overdraft	20,000	Sundry debtors	1,50,000
Sundry creditors	80,000	Bank account	2,00,000
12% debentures	5,00,000	Short term investment	20,000
	29,00,000		29,00,000

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

$$= \frac{\text{Stock + Bills receivables + Debtors + Bank + S.T. Investments}}{\text{S.Creditors + Bills Payable + Bank O.D. + Tax Provision}}$$

$$= \frac{10{,}00{,}000}{4{,}00{,}000} = 2.5 : 1.$$

Interpretation: The current ratio in the said firm is 2.5:1 against a standard ratio of 2:1. It is a good sign of liquidity. However, the stock is found occupying 60 percent of current assets which may not be easily realisable.

$$\text{(ii) Liquid ratio} = \frac{\text{Current Assets} - \text{Stocks}}{\text{Current Liabilities}}$$

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

$$= \frac{4,00,000}{4,00,000}$$

= 1:1.

Interpretation: The standard for quick ratio is 1:1. The calculated ratio in case of Dinesh Limited is also 1:1. The above two ratios show the safety in respect of liquidity in the said firm.

$$\text{(iii) Debt Equity ratio} = \frac{\text{Long term Debt}}{\text{Equity Shareholders' Fund}}$$

$$= \frac{\text{Debentures}}{\text{Equity capital + Preference capital + Reserves + Profit \& Loss a/c}}$$

$$= \frac{5,00,000}{10,00,000 + 5,00,000 + 1,00,000 + 4,00,000}$$

= 1:4.

Interpretation: Debt-equity ratio indicates the firm's long term solvency. It can be observed that the firm's long term loans are constituting 25 percent to that of the owners' fund. Although such a low ratio indicates better long term solvency, the less use of debt in capital structure may not enable the firm to gain from the full stream of leverage effects.

$$\text{(iv) Proprietary ratio} = \frac{\text{Proprietors' Funds}}{\text{Total assets}}$$

$$= \frac{20,00,000}{29,00,000} = 20:29$$

Interpretation: Out of total assets, seven-tenths are found financed by owners' funds. In other words a large majority of long term funds are well invested in various long term assets in the firm.

$$\text{(v) Capital gearing ratio} = \frac{\text{Owners' resources}}{\text{Fixed-interest bearing resources}}$$

$$= \frac{\text{Equity Share Capital + Reserves + P\&L A/c}}{\text{Preference Capital + Debentures}}$$

$$= \frac{10,00,000 + 1,00,000 + 4,00,000}{5,00,000 + 5,00,000}$$

$$= \frac{15,00,000}{10,00,000} = 1.5:1.$$

Interpretation: Keeping Rs.15 lakhs of equity funds as security, the firm is found to have mobilised Rs.10 lakhs from fixed interest bearing sources. It indicates that the capital structure is low geared.

Problem 5 The following are the balance sheet and profit and loss account of Sundara Products Limited as on 31st December 2005.

Profit and Loss Account

To opening stock	1,00,000	By Sales	8,50,000
Purchases	5,50,000	Closing stock	1,50,000
Direct expenses	15,000		
Gross profit	3,35,000		
	---		---
	10,00,000		10,00,000
	---		---
To Admn. expenses	50,000	By Gross profit	3,35,000
Office establishment	1,50,000	Non-operating income	15,000
Financial expenses	50,000		
Non-Operating Expenses/losses	50,000		
Net profit	50,000		
	---		---
	3,50,000		3,50,000

Balance Sheet

Liabilities	Rs.	Assets	Rs.
Equity share capital (2000 @ 100)	2,00,000	Land & Buildings	1,50,000
		Plant & Machinery	1,00,000
Reserves	1,50,000	Stock in trade	1,50,000
Current Liabilities	1,50,000	Sundry Debtors	1,00,000
P&L a/c Balance	50,000	Cash & Bank	50,000
	---		---
	5,50,000		5,50,000
	---		---

Calculate turnover ratios.

Solution:

(i) Share capital to turnover ratio

$$= \frac{\text{Sales}}{\text{Total Capital Employed}}$$

$$= \frac{\text{Sales}}{\text{Equity + Reserve + P \& L a/c Balance}}$$

$$= \frac{8,50,000}{4,00,000}$$

= 2.13 times.

Interpretation: This turnover ratio indicates that the firm has actually converted its share capital into sales for about 2.13 times. This ratio indicates the efficiency in use of capital resources and a high turnover ratio ensures good profitability on operations on an enterprise.

(ii) Fixed Asset's Turnover Ratio

$$= \frac{\text{Sales}}{\text{Total Fixed Assets}}$$

$$= \frac{\text{Sales}}{\text{Land + Plant \& Machinery}}$$

$$= \frac{8,50,000}{2,50,000}$$

= 3.4 times.

Interpretation: Although fixed assets are not directly involved in the process of generating sales, these are said to back up the production process. A ratio of 3.4 times indicates the efficient utilisation of various fixed assets in this organisation.

(iii) Net Working Capital Turnover:

$$= \frac{\text{Sales}}{\text{Net Working Capital}}$$

$$= \frac{\text{Sales}}{\text{Current Assets – Current Liabilities}}$$

$$= \frac{8,50,000}{3,00,000 – 1,50,000}$$

= 5.67 times.

Interpretation: Net working capital indicates the excess of current assets financed by permanent sources of capital. An efficient utilisation of such funds is of prime importance to ensure sufficient profitability along with greater liquidity. A turnover ratio of 5.7 times is really appreciable.

(iv) Average Collection Period:

$$\text{Debtor's turnover} = \frac{\text{Credit Sales}}{\text{Average Debtors}}$$

Assuming that 80% of the sales of 8,50,000 as credit sales:

$$= \frac{6,80,000}{1,00,000}$$

= 6.8 times

Average collection period

$$= \frac{360 \text{ days}}{\text{Debtors' Turnover}}$$

$$= \frac{360}{6.8}$$

= 53 days

Interpretation: Average collection period indicates the time taken by a firm in collecting its debts. The calculated ratio shows that the realisation of cash on credit sales is taking an average period of 53 days. A period of roughly two months indicate that the credit policy is liberal and needs a correction.

(v) Stock Turnover Ratio

$$= \frac{\text{Cost of goods sold}}{\text{Average stock}}$$

$$= \frac{\text{Sales} - \text{Gross Profit}}{(\text{Opening stock} + \text{Closing stock}) \div 2}$$

$$= \frac{5,15,000}{1,25,000}$$

= 4.12 times.

Interpretation: Stock velocity indicates the firm's efficiency and profitability. The stock turnover ratio shows that on an average inventory balances are cleared once in 3 months. Since there is no standard for this ratio, the period of operating cycle of this firm is to be compared with the industry average for better interpretation.

Problem 6: Comment on the performance of Arasu Limited from the ratios given below:

	Industry Average Ratios	Ratios of Arasu Ltd.
1. Current ratio	2:1	2.5:1
2. Debt-equity ratio	2:1	1:1
3. Stock turnover ratio	9.5	3.5
4. Net profit margin ratio	23.5%	15.1%

Solution:

(i) Current ratio: This ratio indicates the liquidity position of a firm. The ability of a firm in meeting its current liabilities could be understood by this ratio. The calculated results show that the liquidity in Arasu Limited is even greater than industry average, showing the safety. However, excess liquidity locks up the capital in unnecessary current assets.

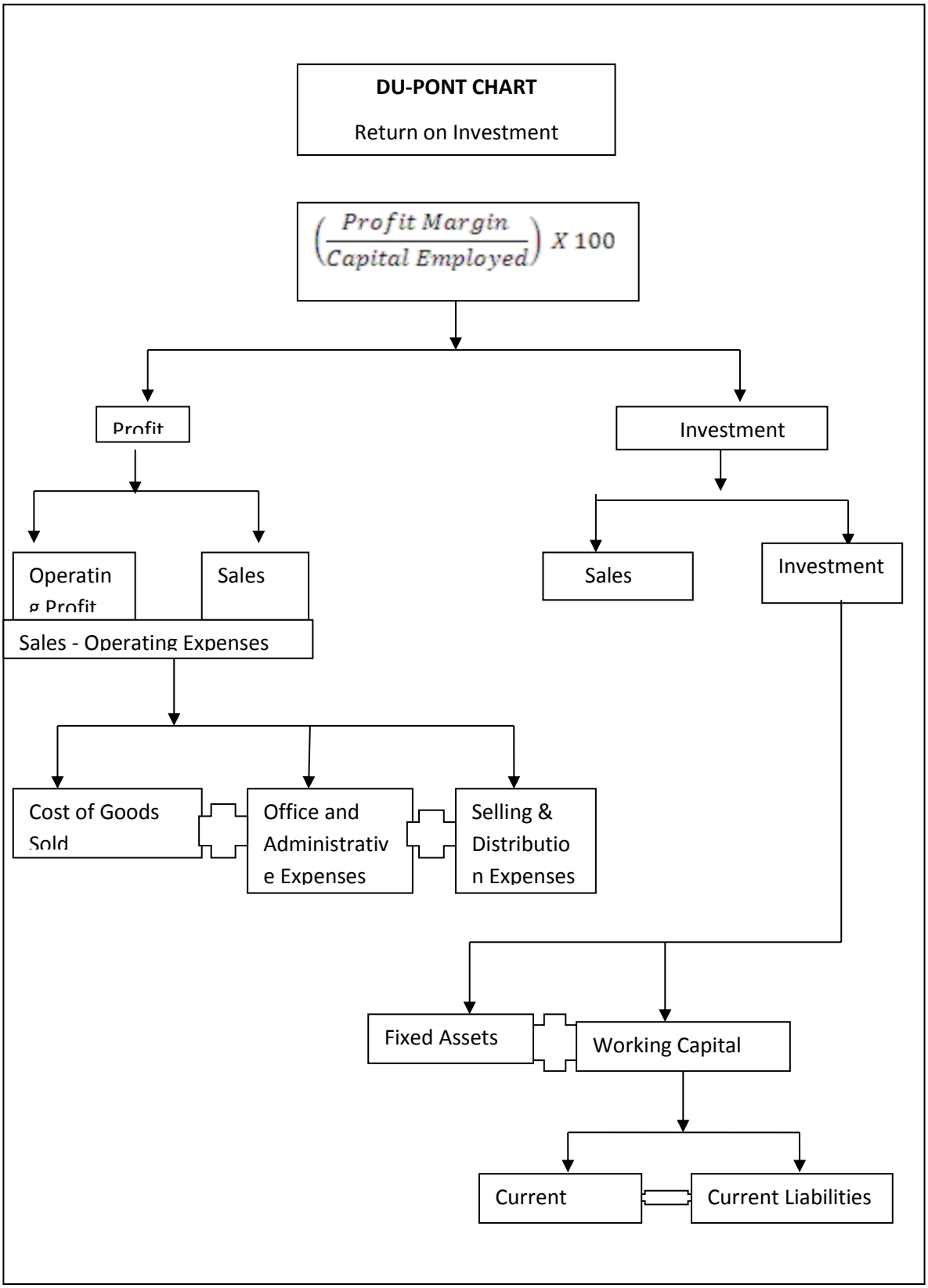
(ii) Debt-equity ratio: It is an indicator of a firm's solvency in terms of its ability to repay long term loans in time. The calculated ratio shows better solvency of 1:1 indicating that for every one rupee of debt capital,

to repay one rupee of equity base exists in Arasu Ltd. However, this ratio is not likely to ensure the leverage benefits that a firm gains by using higher dose of debt.

(iii) Stock turnover ratio: Stock velocity is an indicator of a firm's activeness. It directly influences the profitability of a firm. The calculated ratio for Arasu Ltd. is very poor when compared to industry average. This poor ratio indicates the inefficient use of capacities, consequently, the likely low profitability.

(iv) Net Profit margin ratio: Although the firms in a particular industry could sell the product more or less at same price, the net profits differ among firms due to their cost of production, excessive administrative and establishment expenses etc. This picture is found true in case of Arasu Ltd. A poor profitability of 15.1% compared to an industry average of 23.5% may be due to low stock turnover, inefficiency in management, excess overhead cost and excessive interest burdens.

THE DU PONT CHART



The Du Pont Company of USA introduced this analysis in 1920s. This analysis acquired wider acceptance at the industry level. The Du Pont analysis is an extension of return on investment ratio. This analysis is considered to be an important tool to evaluate the managerial performance by relating the net profit and assets turnover.

The Du Pont chart is mainly based on two components i.e., net profit and capital employed. Net profit is related to operating expenses. If the expenses are within the control then this cost control will definitely reflect in profit margin. Capital employed, on the other hand, consists of current assets and net fixed assets. This analysis is a useful one in segregation and identification of factors that affect the overall performance of the company.

Problem 6. The following figures are extracted from the Balance Sheets of a Company:

	2002-03	**2003-04**	**2004-05**
	Rs.	Rs.	Rs.
Assets			
Buildings	12,000	10,000	20,000
Plant and Equipment	10,000	15,000	10,000
Stock	50,000	50,000	70,000
Debtors	30,000	50,000	60,000
	1,02,000	1,25,000	1,60,000
Liabilities			
Paid up Capital (Rs.10 shares – Rs.7-50 paid up)	56,000	56,000	56,000
Profit & Loss A/c	10,000	13,000	15,000
Trade Creditors	11,000	26,000	39,000
Bank	25,000	30,000	50,000
	1,02,000	1,25,000	1,60,000
Sales	1,00,000	1,50,000	1,50,000
Gross Profit	25,000	30,000	25,000
Net Profit	5,000	7,000	5,000
Dividend Paid	4,000	4,000	3,000

The opening stock at the beginning of the year 2002-03 was Rs.4,000. As a financial analyst comment on the comparative short-term, activity, solvency, profitability and financial position of the company during the three year period.

Solution:

To test the short-term solvency the following ratios are calculated for three years:

i. Current Ratio and

ii. Quick Ratio

(i) ***Current Ratio***:

	2002-03	2003-04	2004-05
Current Assets	80,000	1,00,000	1,30,000
----------	--------	----------	----------
Current Liabilities	36,000	56,000	89,000
	2.22:1	1.80:1	1.46:1

(ii) Quick Ratio:

	2002-03	2003-04	2004-05
Quick Assets (Debtors)	30,000	50,000	60,000
----------	--------	-------	--------
Quick Liabilities (Creditors)	11,000	26,000	39,000
	2.7:1	1.9:1	1.5:1

As the standard for Current Ratio is 2:1 the working capital position of the company has weakened in the 2nd year and 3rd year. However the Quick Ratio for all the three years is well above the standard of 1:1. Thus it can be said that the short term solvency position of the company shows a mixed trend.

Activity Ratios: To test the operational efficiency of the company the following ratios are calculated. Debtors Turnover Ratio and Inventory Turnover Ratio.

Debtors Turnover Ratio:

	2002-03	2003-04	2004-05
Sales	1,00,000	1,50,000	1,50,000
----------	----------	----------	----------
Average Debtors	30,000	40,000	55,000
	3.33 times	3.75 times	2.73 times

The sales as a number of times of debtors has improved in the year 2003-04 but has deteriorated in the year 2004-05.

Inventory Turnover Ratio:

	2002-03	2003-04	2004-05
Cost of Goods Sold (Sales – G.P.)	75,000	1,20,000	1,25,000
----------	---------	----------	----------
Average Stock (O.S + C.S / 2)	27,000	50,000	60,000
	2.78 times	2.40 times	2.08 times

Though there is no standard for Inventory Turnover Ratio, higher the ratio, better is the activity level of the concern. From this angle the Ratio has come down gradually during the three year period indicating slow moving of stock.

Profitability Ratios: To analyse the profitability position of the company, Gross Profit Ratio and Net Profit Ratio are calculated.

Gross Profit Ratio:

	2002-03	2003-04	2004-05
Gross Profit	25,000	30,000	25,000
---------- x 100	----------	----------	----------
Sales	1,00,000	1,50,000	1,50,000
	25%	20%	16.7%

Net Profit Ratio:

	2002-03	2003-04	2004-05
Net Profit	5,000	7,000	5,000
---------- x 100	----------	----------	----------
Sales	1,00,000	1,50,000	1,50,000
	5%	4.7%	3.3%

The profitability ratios show that there is steady decline in the profitability of the concern during the period. One reason for this declining profitability among others, is the low and decreasing inventory turnover ratio.

Financial Position: Here the long term solvency position of the concern is analysed by calculating Debt/Equity Ratio and Debt/Asset Ratio.

Debt/Equity Ratio:

	2002-03	2003-04	2004-05
Debt	36,000	56,000	89,000
---------	--------	--------	--------
Equity	66,000	69,000 7	1,000
	0.545:1	0.812:1	1.254:1

Debt/Asset Ratio:

	2002-03	2003-04	2004-05
Debt	36,000	56,000	89,000
---------	----------	----------	----------
Assets	1,02,000	1,25,000	1,61,000
	0.35:1	0.448:1	0.556:1

Debt Equity Ratio expresses the existence of Debt for every Re.1 of Equity. From this standpoint the share of debt in comparison to equity is increasing year after year and in the last year the debt is even more than equity. Debt Asset Ratio gives how much of assets have been acquired using debt funds. The calculation of this ratio reveals that in the 1st year 35% of assets were purchased using debt funds which has increased to 44.8% in the 2nd year and 55.6% in the 3rd year. Thus both the ratios reveal that the debt component in the capital structure is increasing which has far reaching consequences.

Summary

Financial statements by themselves do not give the required information both for internal management and for outsiders. They must be analysed and interpreted to get meaningful information about the various aspects of the concern. Analysing financial statements is a process of evaluating the relationship between the component parts of the financial statements to obtain a proper understanding of a firm's performance. Financial analysis may be external or internal analysis or horizontal or vertical analysis. Financial analysis can be carried out through a number of tools like Ratio analysis, Funds flow analysis, Cash flow analysis etc. Among the various tools available for their analysis, ratio analysis is the most popularly used tool. The main purpose of ratio analysis is to measure past performance and project future trends. It is also used for inter-firm and intra-firm comparison as a measure of comparative productivity. The financial analyst X-rays the financial conditions of a concern by the use of various ratios and if the conditions are not found to be favourable, suitable steps can be taken to overcome the limitations.

SELF ASSESSMENT QUESTIONS

1. Explain the meaning of the term `Financial Statements'. State their nature and limitations.
2. Explain the different types of financial analysis.
3. Explain the various tools of financial analysis.
4. Justify the need for analysis and interpretation of financial statements.
5. Collect the annual reports of any public limited company for a period of 5 years. Calculate the trend percentages and prepare a report.
6. What is meant by Ratio Analysis? Explain its significance in the analysis and interpretation of financial statements.
7. Explain the importance of Ratio analysis in making comparisons between firms.
8. How are the ratios broadly classified? Explain how ratios are calculated under each classification.
9. What are the limitations of Ratio Analysis?
10. From the below given Summary Balance Sheet, calculate current ratio and long term solvency ratio.

Balance Sheet as on 31st December 2005

Liabilities	Rs.	Assets	Rs.
Share capital	4,00,000	Fixed assets	4,00,000
Long term loans	2,00,000	Current assets	4,00,000
Current liabilities	2,00,000		
	---		---
	8,00,000		8,00,000

Key Q.No.10: Current ratio: 2:1; Debt equity ratio: 1:2 or 1:1.

11. From the following trading and profit and loss account and balance sheet calculate (i) stock turnover ratio (ii) debtors' velocity (iii) sales to working capital (iv) sales to total capital employed (v) return on investment (vi) current ratio (vii) net profit ratio and (viii) operating ratios.

Trading and Profit and Loss Account

	Rs.		Rs.
To Opening stock	1,00,000	By Sales	10,00,000
To Purchase	5,50,000	By Closing stock	1,50,000
To Gross profit	5,00,000		
	11,50,000		11,50,000
		By Gross Profit	5,00,000
Admn. Expenses	1,50,000		
Interest	30,000		
Selling expenses	1,20,000		
Net profit	2,00,000		
	5,00,000		5,00,000

Balance Sheet

Share capital	10,00,000	Land & Building	5,00,000
Profit & Loss a/c	2,00,000	Plant & Machinery	3,00,000
S.Creditors	2,50,000	Stock	1,50,000
Bills payable	1,50,000	Debtors'	1,50,000
		Bills receivable	1,25,000
		Cash in hand	1,75,000
		Furniture	2,00,000
	16,00,000		16,00,000

Key Q.No.11: (i) 4 times; (ii) 100 days; (iii) 5 times; (iv) 0.83 times; (v) 19.17%; (vi) 1.5:1; (vii) 20%; (viii) 77%.

12. Sakkara Engineering Limited has the following capital structure:

9% Preference shares of Rs.100 each	10,00,000
Equity shares of Rs.10 each	40,00,000
	50,00,000

The following information relates to the financial year just ended:

Profit after taxation	22,00,000
Equity Dividend paid	20%
Market price of Equity shares	Rs.20 each

You are required to find

(a) Dividend yield on equity shares
(b) The cover for preference and equity dividend
(c) Earnings per share
(d) P/E ratio

Key Q.No.12: (a) 10%; (b) 24.4 times and 2.6 times (c) Rs.5.275; (d) 3.8 times.

LESSON 4.2 FUND FLOW AND CASH FLOW ANAYSIS

Learning Objectives: After studying this lesson you are able to understand:

- ✓ Meaning and Significance of Fund Flow Analysis
- ✓ Uses of Funds-Flow Statement
- ✓ The Sources of Funds And Application of Funds
- ✓ How to Prepare the Fund Flow Statement
- ✓ Cash flow statement and the Objectives of Cash-Flow Analysis
- ✓ Advantages of Cash Flow statements
- ✓ Sources of Cash or Cash-Inflow / Uses or Application of Cash
- ✓ Utility of cash flow analysis

Contents:

- Introduction
- Meaning of Funds-Flow
- Significance of Fund Flow Analysis
- Uses of Funds-Flow Statement
- Sources of Funds And Application of Funds
- Preparation of Fund Flow Statement
- Fund Flow Statement Problems
- Cash flow statement
- Object of Cash-Flow Analysis
- Advantages of Cash Flow statementuses or Application of Cash
- Sources of Cash or Cash-Inflow
- Uses or Application of Cash
- Utility of cash flow analysis
- Cash Flow Statement Problems

Introduction

A fund flow statement is a valuable aid to financial manager or a creditor in evaluating the uses of funds by a firm and in determining how these uses are financed. Such a statement provides an efficient method for the financial manager to assess the growth of the firm and its resulting financial needs and to determine the best way to finance those needs. In the nut-shell, funds statements are very useful in planning intermediate and long-term financing. It is an important tool of working capital analysis.

Meaning of Funds-Flow

The term ’funds’ has been defined in a number of ways. Some interpret ’funds’ as **‘**cash**’** only and fund-flow statement prepared on this basis is called a cash flow statement.

On the other hand in funds flow statement, a broader approach is adopted interpreting the term, ’funds’. It is conceived as all financial resources and it extends the concepts to include all the current assets of financial resources. The narrower definition of fund, such as cash-flow often leads to the omission of such items which do not directly affect cash or working capital. But in a broader sense, the assets of a firm represent the net uses of funds and its liabilities and net worth represents net resources. Thus the term ‘funds-flow’ refers to changes in working capital. Changes in working capital position of a business unit are significant consideration in the analysis of operating results and financial conditions.

Meaning of Funds-Flow Statement

The funds statement is a method by which we study the net funds-flow between two points in time. These points conform to beginning and ending financial statement dates for whatever period of examination is relevant - a quarter or a year. Foulke defines this statement as follows: “A statement of sources and application of funds is a technical device designed to analyse the changes in the financial condition of a business enterprise between two dates”.

Thus a Funds-Flow Statement is a report on financial operations changes, flows or movements during the periods here the term funds denotes the ‘working capital’. Working capital is oftenly recorded as the difference of current assets and current liabilities. Hence the term ‘fund’ and working capital, both are synonymous.

Significance of Fund Flow Analysis

Funds flow analysis provides an insight into the movement of funds and helps in understanding the change in the structure of assets, liabilities and owners’ equity. This analysis helps financial managers to find answers to questions like:

- How far capital investment has been supported by long term financing?
- How far short-term sources of financing have been used to support capital investment?
- How much funds have been generated from the operations of a business?
- To what extent the enterprise has relied on external sources of financing?

- What major commitments of funds have been made during the year?
- Where did profits go?
- Why were dividends not larger?
- How was it possible to distribute dividends in excess of current earnings or in the presence of a net loss during the current period?
- Why are the current assets down although the income is up?
- Has the liquidity position of the firm improved?
- What accounted for an increase in net current assets despite a net loss for the period?
- How was the increase in working capital financed?

Uses of Funds-Flow Statement

Funds-Flow Statement is a useful tool in the financial manager's analytical kit. The basic purpose of this statement is to indicate where funds came from and where they were used during the certain period. The utility of this statement can be very well measured on the basis of the contribution it makes to the financial management. it provides the following main services

1. Analysis of Financial Operations – A Funds-Flow Statement gives us a rich insight in to the financial operations of a firm – an insight which is specially valuable to the financial manager in analyzing past and future expansion plans of the firm and the impact of these plans on liquidity. He can detect imbalances in the uses of funds and undertake appropriate actions.

2. Evaluation of the Firm's Financing – One important use of Funds-Flow Statement as in the evaluation of the firm's financing. An analysis of the major sources of funds in the fast reveals what position of the firm's growth was financed internally and what position externally.Fund Statement is also useful in judging whether the firm has expanded at too fast a rate and whether financing strained.

3. A Tool of Communication –The use of the Sources and Application of Funds Statement as a tool of communication should also not be forgotten. It clearly defines the past flow of funds and gives insight into the evaluation of the present situation. The financial manager of the company uses it to spotlight the causes of present financial strain, to answer the question of "where our resources been moving?" it provides certain useful information to bankers, creditors and government etc. for which they do not require to approach the top management specially. In fact, it is a good communiqué of firm's financial policies to the outside world.

4. Future Guidance – An analysis of a fund statement for the future is extremely valuable to the financial manager in planning the intermediate and long term financing of the firm. It tells him the

firm's total prospective need for funds, the expected timing of these needs and their nature too. On this basis of this information, along with the expected changes in trade payable and the various accruals, he can arrange the firm's financing more effectively.

Broadly speaking, the funds-flow statement consists of two parts – first is schedule of changes in working capital and second is statement of sources and uses of funds. Generally, this statement is prepared in two formats – in repot form or in an Account Form.

Sources of Funds

The transactions that increase working capital are sources of funds. Some of them are

1. Funds from Operations
    a. Depreciation and Depletion
    b. Amortization of non-fund items
    c. Provision for Taxation
    d. Appropriation of Retained Earnings
    e. Loss on sale of Assets

The following items are deduction from profits

    a. Dividends Received from Outside
    b. Retransfer of excess Provision
    c. Profit or gain on Sale of Assets
    d. Appreciation in the value of Fixed Assets

2. Issue of share Capital
3. Issue of Debentures or Long term loans
4. Sale of Fixed Assets
5. Non-Trading Receipts

Application of Funds

1. Purchase of any Fixed Assets
2. Payments of Loan etc.
3. Payment of dividend
4. Increase in Working Capital

Preparation of Fund Flow Statement: It includes

(i) Statement or Schedule of Changes in Working Capital

(ii) Statement of Funds Flow

(A) Statement of Changes in Working Capital: This statement when prepared shows whether the working capital has increased or decreased during two Balance Sheet dates. But this does not give the reasons for increase or decrease in working capital. This statement is prepared by comparing the current assets and the current liabilities of two periods. Any increase in current assets will result in increase in Working Capital and any decrease in Current Assets will result in decrease in Working Capital. Any increase in current liability will result in decrease in working capital and any decrease in current liability will result in increase in working capital. It is shown in the following form:

Format of Statement showing Changes in Working Capital

Items	As on	As on	Change	
			Increase	Decrease
Current Assets Cash Balances Bank Balances Marketable Securities Stock in Trade Pre-paid Expenses **Current Liabilities** Bank Overdraft Outstanding Expenses Accounts Payable Provision for Tax Dividend				
Increase / Decrease in Working Capital				

(B) Funds Flow Statement: Funds Flow Statement is also called as Statement of Changes in Financial Position or Statement of Sources and Applications of Funds or where got, where gone statement. The purpose of the funds flow statement is to provide information about the enterprise's investing and financing activities. The activities that the funds flow statement describes can be classified into two categories:

(i) activities that generate funds, called Sources, and

(ii) activities that involve spending of funds, called Uses.

When the funds generated are more than funds used, we get an increase in working capital and when funds generated are lesser than the funds used, we get decrease in working capital. The

increase or decrease in working capital disclosed by the schedule of changes in working capital should tally with the increase or decrease disclosed by the Funds Flow Statement.

The Funds Flow Statement may be prepared either in the form of a statement or in `T' shape form and it appears as follows:

Funds Flow Statement

Sources of Funds		**Application of Funds**	
* Funds from operation	**X XX**	Funds lost in operations	**X XX**
Issue of shares	**X XX**	Redemption of Preference Shares	**X XX**
Issue of Debentures	**X XX**	Redemption of Debentures	**X XX**
Long-term borrowings	**X XX**	Payment of other long-termLoans	**X XX**
Sale of fixed assets	**X XX**	Purchase of fixed assets	**X XX**
* Decrease in workingcapital	**X XX**	Payment of dividend, tax,etc.	**X XX**
		Increase in working capital	**X XX**
TOTAL	**X XX**	TOTAL	**X XX**

Solved Fund Flow Statement Problems

1. From the following information relating to Bright Ltd., calculate funds lost in operations.

Net Loss for the year	90,000
Dividend received	7,000
Depreciation charged	10,000
Proit on sale of assets	5,000
Refund of tax	2,000

Adjusted Profit and Loss Account

	₹		₹
To Deprecation	10,000	By Dividend received	7,000
To Fund lost in operations (B.F)	94,000	By Profit on sale of assets	5,000
		By Refund of tax	2,000
		By Net Loss	90,000
		By Dividend received	7,000
	1,04,000		1,04,000

2. From the following information relating to Selvam Ltd., calculate funds lost in operations.

Net Loss for the year	1,90,000
Dividend received	17,000
Depreciation charged	50,000
Proit on sale of assets	15,000
Refund of tax	12,000

Adjusted Profit and Loss Account

	₹			₹
To Deprecation	50,000		By Dividend received	17,000
To **Fund lost in operations** (B.F)	1,86,000		By Profit on sale of assets	15,000
			By Refund of tax	14,000
			By Net Loss	1,90,000
	2,36,000			2,36,000

3. From the following profit and loss account you are required to compute fund from operations:

Profit and Loss Account for the year ending 31st March 2005.

	₹.		₹.
To Salaries	25,000	By Gross Profit	5,00,000
To Rent	1,00,000	By Profit on sale of vehicle	3,000
To provision for Depreciation	50,000	By Income Tax Refund	2,000
To Commission paid	5,000	By Dividends	10,000
To Provision for Taxation	1,50,000		
To Loss on sale of Investment	10,000		
To Cost of issue of shares written-off	2,000		
To provision for legal damages	5,000		
To Reserve for doubtful Debts	3,000		
To Net Profit	1,65,000		
	5,15,000		**5,15,000**

	₹.	₹.
Net profit as per Income Statement		1,65,000
Add: Non-fund items		
Provision for Depreciation	50,000	
Provision for Taxation	1,50,000	
Reserve for doubtful debts	3,000	
Loss on Sale of Investment	10,000	
Cost of issue of shares written-off	2,000	

Provision for legal damages	5,000	2,20,000
		3,85,000
Less: Non-trading profits:		
Dividend received	10,000	
Profit on sale of vehicle	3,000	
Refund of Tax		15,000
Fund From operation		**3,70,000**

4. From the following profit and loss account you are required to compute cash from operations:

Profit and Loss Account for the year ending 31st March 2009.

	₹		₹
To Salaries	5,000	By Gross Profit	25,000
To Rent	1,000	By Profit on sale of Land	5,000
To Depreciation	2,000	By Income Tax Refund	3,000
To Loss on sale of Plant	1,000		
To Goodwill written off	4,000		
To Proposed dividend	5,000		
To Provision for taxation	5,000		
To Net Profit	10,000		
	33,000		33,000

Adjusted Profit and Loss Account

	₹			₹
To Net Profit	10,000		By Profit on sale of Land	5,000
To Deprecation	2,000		By Refund of tax	3,000
To Loss on sale of Plant	1,000		**By Fund From Operation**	**19,000**
To Goodwill written off	4,000			
To Proposed dividend	5,000			
To Provision for taxation	5,000			
	27,000			27,000

5. From the following balance sheets of Parana Ltd. on 31st March 2011 and 2012, you are required to prepare funds flow statement.

Liabilities	2011 ₹	2012 ₹	Assets	2011 ₹	2012 ₹
Share capital	1,00,000	1,00,000	Goodwill	12,000	12,000
General reserve	14,000	18,000	Buildings	40,000	36,000
Profit & loss a/c	16,000	13,000	Plant	37,000	36,000
Sundry creditors	8,000	5,400	Investment	10,000	11,000
Bills payable	1,200	800	Stock	30,000	23,400

Provision of taxation	16,000	18,000	Bills receivable	2,000	3,200
Provision for doubtful debts	400	600	Debtors	18,000	19,000
			Cash	6,600	15,200
	1,55,600	1,55,800		1,55,600	1,55,800

The following additional information has also been given

(i) Depreciation charged on plant was ₹.4,000 and on Building ₹4,000

(ii) Provision for taxation of ₹.19,000 was made during the year 2012

(iii) Interim dividend of ₹.8,000 was paid during the year 2012.

Schedule of changes in working capital

	2011 ₹	2012 ₹	Increase ₹	Decrease ₹
Current assets:				
Stock	30,000	23,400	-	6,600
Bills receivable	2,000	3,200	1,200	-
Debtors	18,000	19,000	1,000	-
Cash	6,600	15,200	8,600	-
	56,600	60,800		
Less: Current liabilities				
Sundry creditors	8,000	5,400	2,600	-
Bills payable	1,200	800	400	-
Provision for doubtful debts	400	600		200
	9,600	6,800	13,800	6,800
	47,000	54,000		7,000
Working capital	7,000			
Increase in working capital	54,000	54,000	13,800	13,800

Funds flow statement

Sources	₹	**Applications**	₹
Funds from operations	36,000	Purchase of plant	3,000
		Purchase of investment	1,000
		Tax paid	17,000
		Interim dividend paid	8,000
		Increase in working capital	7,000
	36,000		36,000

6. Following are the comparative Balance Sheets of Good Luck Co. as at 31st March.

Liabilities	!999 Rs.	2000 Rs.	Assets	1999 Rs.	2000
Share capital	10,00,000	11,00,000	Good will	50,000	40,000
Debentures	5,00,000	3,00,000	Land & Build	4,20,000	6,60,000

General reserve	2,00,000	2,00,000	Plant	6,00,000	8,00,000
Profit & Loss	1,10,000	1,90,000	Stocks	2,50,000	2,10,000
Income tax prov.	40,000	1,10,000	Debtors	3,00,000	2,40,000
Creditors	50,000	40,000	Cash	3,00,000	24,000
Bills payable	20,000	30,000	Preliminary expenses	30,000	20,000
Provision for Doubtful debts	30,000	24,000			
	19,50,000	19,94,000		19,50,000	19,94,000

You are required to prepare A Schedule of change in working capital.

Schedule of changes in working capital

	2008	2009	Increase	Decrease
Current assets:				
Stock	2,50,000	2,10,000	-	6,600
Debtors	3,00,000	24,00	1,200	-
Cash	18,000	19,000	1,000	-
	6,600	15,200	8,600	-
Less: Current liabilities	56,600	60,800		
Sundry creditors				
Bills payable	8,000	5,400	2,600	-
Provision for doubtful	1,200	800	400	-
debts	400	600		200
	9,600	6,800	13,800	6,800
Working capital	47,000	54,000		7,000
Increase in working capital	7,000			
	54,000	54,000	13,800	13,800

7. From the following balance sheets of XYZ ltd. on 31st December, 2008 and 2009, you are required to prepare funds flow statement.

Liabilities	2008	2009	Assets	2008	2009
Share capital	1,00,000	1,00,000	Goodwill	12,000	12,000
General reserve	14,000	18,000	Buildings	40,000	36,000
Profit & loss a/c	16,000	13,000	Plant	37,000	36,000
Sundry creditors	8,000	5,400	Investment	10,000	11,000
Bills payable	1,200	800	Stock	30,000	23,400
Provision of taxation	16,000	18,000	Bills receivable	2,000	3,200
Provision for doubtful	400	600	Debtors	18,000	19,000
debts			Cash	6,600	15,200
	1,55,600	1,55,800		1,55,600	1,55,800

The following additional information has also been given

(iv) Depreciation charged on plant was Rs.4,000 and on Building Rs.4,000

(v) Provision for taxation of Rs.19,000 was made during the year 2009

(vi) Interim dividend of Rs.8,000 was paid during the year 2009.

Schedule of changes in working capital

	2008	2009	Increase	Decrease
Current assets:				
Stock	30,000	23,400	-	6,600
Bills receivable	2,000	3,200	1,200	-
Debtors	18,000	19,000	1,000	-
Cash	6,600	15,200	8,600	-
	56,600	60,800		
Less: Current liabilities				
Sundry creditors	8,000	5,400	2,600	-
Bills payable	1,200	800	400	-
Provision for doubtful debts	400	600		200
	9,600	6,800	13,800	6,800
	47,000	54,000		7,000
Working capital	7,000			
Increase in working capital	54,000	54,000	13,800	13,800

Funds flow statement

Sources	Rs.	Applications	Rs.
Funds from operations	36,000	Purchase of plant	3,000
		Purchase of investment	1,000
		Tax paid	17,000
		Interim dividend paid	8,000
		Increase in working capital	7,000
	36,000		36,000

CASH FLOW STATEMENT

While explaining the concept of `fund' it was mentioned that in a narrower sense the term `fund' is also used to denote cash. The term `cash' in the context of cash flow analysis stands for cash and bank balances. Cash flow refers to the actual movement of cash in and out of an organisation. When cash flows into the organisation is called cash inflow or positive cash flow. In the same way when cash flows out of the organisation, it is called cash outflow or negative cash flows. Cash flow analysis is an analysis based on the movement of cash and bank balances. Under cash flow analysis, all movements of cash would be considered.

The cash plays an important role in the business firm's economic life. In any business firm there is a constant inflow and outflow of cash. This movement of cash is of vital important to management, for if the inflows of cash are not sufficient to meet the out flows, the firm will be

unable to meet its current obligations. Hence the need of proper planning and control of cash-flows arises here. Cash-flow statement is an important tool of cash planning and control. At the same time it serves as a variable tool of financial analysis too.

Cash-Flow Defined – The current management accounting literature uses the term 'cash flow' in two different ways. Some use it to refer to the movement of cash in and out of a business. They are interested accounting for the change in the cash account by subtracting the cash disbursements of the period from the cash receipts.

Object of Cash-Flow Analysis – The main object of cash-flow analysis is to the causes of changes in cash balance. The next main object of cash-flow analysis is to throw light on the factors contributing to the reduction of balance of cash inspite of increase in profits or vice versa. Cash-flow analysis is of particular importance in short-range planning. It helps the management in short-term financial decisions relating to liquidity and ways and means position.

The following are the major differences between 'fund flow' and 'cash flow'

1. Cash-flow deals with the cash transactions only while funds flow is concerned with all the items constituting funds for the financing of assets acquisition programme.
2. In cash-flow statement only cash receipts and disbursements of cash are recorded while in a fund-flow statement their net effect is recorded.
3. Cash-flow is concerned with cash only while fund-flow is concerned with the total provision of funds. A funds flow statement is a flexible device designed to disclose and emphasize all significant changes in the current assets and current liabilities of the firm during the period under study

Advantages of Cash Flow Statement

A Cash Flow Statement is of primary importance to the financial management. it is an essential tool of short-term financial analysis. Its main uses are as follows:

1) It is very helpful in the evaluation of cash position of a firm. Since cash is the basis for the carrying on business operations, the cash-flow statement is very useful in evaluating the current cash position.
2) It helps the management in understanding the past behaviour of cash cycle and in controlling the uses of cash in future.
3) The repayment of loans, replacement of assets and other such programmes can be planned on its basis.

4) It throws light on the factors contributing to the reduction of cash balance inspite of increase in income or vice-versa
5) A comparison of the cash-flow statement with the budgeted forecast of cash for the same period helps in comparison and control of cash expenditures
6) This statement is helpful in short-term financial decisions relating of liquidity and ways means position of the firm.

Sources of Cash or Cash-Inflow

1. Cash from Trading Operations
    a) Cash Sales Method
2. Increase in share capital, Debentures and Fixed and Current Liabilities
3. Reduction in or Sale of Assets
4. Other Sources of Cash

Uses or Application of Cash

1) Payment of Operating Cost of the Firm
2) Purchase of increase in Assets
3) Reduction in or Discharge of a Liability
4) Any non-recurring expenditure
5) Distribution of Profits to Owners

Cash Flow Statement for the year ending say 31st March 2012

Balance as on 1-4-2011		**Balance as on 1-4-2011**	
Cash in hand	x xx	Bank overdraft (if any)	x xx
Cash at Bank	x xx		
Add: Cash Inflows:		**Cash Outflows**:	
Here the items mentioned as sources of cash inflows above will be recorded		Here the items mentioned as outflows of cash above will be recorded	
Balance as on 31-3-2012		**Balance as on 31-3-2012**	
Bank overdraft (if any)	x xx	Cash in hand	x xx
Cash at Bank	x xx		
---		---	
x xx		xxx	
---		---	

The Accounting Standard 3 issued by the Institute of Chartered Accountants of India requires the companies to prepare Cash Flow Statement and present them as part of their Annual Reports.

Preparation of Cash flow Statement.

The first step in the calculation of cash from operations is the calculation of funds from operations (which is already explained in the lesson on Funds Flow Analysis). To the funds from operations the decrease in current assets and increase in current liabilities will be added (except cash, Bank and Bank O.D.). From the added total, increase in current assets and decrease in current liabilities will be deducted (except cash, Bank and Bank O.D.). The resultant figure is cash from operations (Refer Illustration 3).

Proforma of Cash from Operations Statement

Funds from Operations or Funds lost from operations x xxx

Add: Decrease in current assets x xxx
Increase in current liabilities x xxx
---
x xxx

Less: Inecrease in current assets x xx
Decrease in current liabilities x xx
------ x xxx

Cash from operations or cash lost from operations

As in the case of Fund Flow Analysis here also we assume **Provision for Taxation** and **Proposed Dividend** as current liabilities.

UTILITY OF CASH FLOW ANALYSIS

Cash flow analysis yields the following advantages:

I. It is very helpful in understanding the cash position of the firm. This would enable the management to plan and coordinate the financial operations properly.
II. Since it provides information about cash which would be available from operations the management would be in a position to plan repayment of loans, replacement of assets, etc.
III. It throws light on the factors contributing to the reduction of cash balance inspite of increase in income and vice versa.
IV. A comparison of the cash flow statement with the cash budget for the same period helps in comparing and controlling cash inflows and cash outflows.

However cash flow analysis is not without limitations. The cash balance as disclosed by the cash flow statement may not represent the real liquid position of the business since it can be easily influenced by postponing purchases and other payments. Further cash flow statement cannot

replace the income statement or funds flow statement. Each of them has a separate function to perform.

Solved Cash Flow Statement Problems

8. The following are the comparative balance sheets of Mathivanan Ltd., as on 31st March 2011 and 2012.

Liabilities	**20011** ₹	**2012** ₹	**Assets**	**2011** ₹	**2012** ₹
Share Capital (Shares of Rs.10 each)	3,50,000	3,70,000	Land	1,00,000	1,50,000
Profit & Loss A/c	50,400	52,800	Stocks	2,46,000	2,13,500
9% Debentures	60,000	30,000	Goodwill	50,000	25,000
Creditors	51,600	59,200	Cash and Bank	42,000	35,000
			Temporary Investments	3,000	4,000
			Debtors	71,000	84,500
	5,12,000	**5,12,000**		**5,12,000**	**5,12,000**

Other particulars provided to you are: 1) Dividends declared and paid during the year ₹17,500, 2) Land was revalued during the year at ₹.1,50,000 and the profit on revaluation transferred to profit and loss account. You are required to prepare a Cash Flow Statement for the ended 31st March 2012.

Cash flow statement
(For the year ended 31-03-2012)

	₹	₹
Cash Flows from Operating Activities		
Increase in the balance of P/L A/c.	2,400	
Adjustments for non-cash and non-operating items:		
Profit on revaluation of land	(50,000)	
Goodwill written off	25,000	
Dividend declared	17,500	
Operating Profit before working capital changes	(5,100)	
Adjustments of changes in current operating assets and liabilities:		
Increase in Creditors	7,600	
Decrease in Stock	32,500	
Increase in Debtors	(13,500)	
Cash generated from operations	21,500	
Income tax paid	--	
Cash flows from extraordinary activities	21,500	
Net cash from operating activities		21,500
Cash Flows from Investing Activities	-	
Cash Flows from Financing Activities		
Proceeds from the issue of Share Capital	20,000	
Redemption of Debentures	(30,000)	
Dividend paid	(17,500)	
Net cash used in financing activities		(27,500)
Net Decrease in cash and cash equivalents		(6,000)
Cash and cash equivalents at the beginning of the period		45,000
Cash and cash equivalents at the end of the period		39,000

Note: Temporary investments have been treated as liquid investments and hence cash equivalents.

9. The following are the comparative balance sheets of XYZ Ltd., as on 31st Marach 2005 and 2006.

Liabilities	2005	2006	Assets	2005	2006
Share Capital (Shares of Rs.10 each)	3,50,000	3,70,000	Land	1,00,000	1,50,000
Profit & Loss A/c	50,400	52,800	Stocks	2,46,000	2,13,500
9% Debentures	60,000	30,000	Goodwill	50,000	25,000
Creditors	51,600	59,200	Cash and Bank	42,000	35,000
			Temporary Investments	3,000	4,000
			Debtors	71,000	84,500
	5,12,000	**5,12,000**		**5,12,000**	**5,12,000**

Other particulars provided to you are: 1) Dividends declared and paid during the year ₹17,500, b) Land was revalued during the year at ₹1,50,000 and the profit on revaluation transferred to profit and loss account. You are required to prepare a Cash Flow Statement for the ended 31st March 2006.

Cash flow statement
(For the year ended 31st March 2006)

	`	`
Cash Flows from Operating Activities		
Increase in the balance of P/L A/c.	2,400	
Adjustments for non-cash and non-operating items:		
Profit on revaluation of land	(50,000)	
Goodwill written off	25,000	
Dividend declared	17,500	
Operating Profit before working capital changes	(5,100)	
Adjustments of changes in current operating assets and liabilities:		
Increase in Creditors	7,600	
Decrease in Stock	32,500	
Increase in Debtors	(13,500)	
Cash generated from operations	21,500	
Income tax paid	--	
Cash flows from extraordinary activities	21,500	
Net cash from operating activities		21,500
Cash Flows from Investing Activities	-	
Cash Flows from Financing Activities		
Proceeds from the issue of Share Capital	20,000	
Redemption of Debentures	(30,000)	
Dividend paid	(17,500)	
Net cash used in financing activities		(27,500)
Net Decrease in cash and cash equivalents		(6,000)
Cash and cash equivalents at the beginning of the period		45,000
Cash and cash equivalents at the end of the period		39,000

Note: Temporary investments have been treated as liquid investments and hence cash equivalents.

10. The following are the summarized Balance Sheet of M/S MES Ltd as on 31st March 2000 and 2001. Prepare a cash flow statement.

(₹In lakhs)

LIABILITIES	2000 ₹.	2001 ₹	ASSETS	2000 ₹.	2001 ₹
Share Capital	8,000	8,500	Land	5,000	5,000
Profit & Loss account	1,450	2,450	Plant &Machinery	2,400	3,400
Mortgage Loan	--	500	Stock	900	700
Sundry creditors	900	500	Debtors	1,650	1,950
			Cash	400	900
	10,350	11,950		10,350	11,950

Cash Flow Statement

		₹			₹.
Opening balance of cash		400	Purchase of plant		1,000
Issue of shares		500	Increase in debtors		300
Mortgage loan	500		Decrease in creditors	400	
Cash trading profit	1,000		Closing balance of cash	900	
Decrease in stock		200			
		2,600			**2,600**

Summary

A funds flow statement officially called as statement of changes in financial position, provides information about an enterprise's investing and financing activities during the accounting period. Though there are many concepts of funds, the working capital concept of funds has been used in this lesson. Flow of funds results only when there is a cross transaction i.e. only when a transaction involves a fixed asset or liability and a current asset or liability. The main sources of funds are: funds from operations, issue of shares and debentures and sale of non-current assets. The main uses of funds are repayment of long-term liabilities including redemption of preference shares and debentures, purchase of non-current assets and payment of dividends. Funds flow statement helps the financial analyst in having a more detailed analysis and understanding of changes in the distribution of sources between two balance sheet dates. In addition to funds flow statement concerns are also preparing cash flow statement which is the outcome of cash flow analysis. Cash flow analysis is based on the movement of cash and bank balances and the cash flow statement is a statement depicting changes in cash position from one period to another period.

Self Assessment Questions

1. What do you mean by working capital concept of funds?

2. Explain the significance of funds flow analysis and cash flow analysis.

3. Distinguish between schedule of changes in working capital and funds flow statement.

4. Distinguish between cash flow analysis and funds flow analysis.

5. Shyam and Company has the following information for the year ending 31st March 2012:Sales Rs.5,000, Depreciation Rs. 450, Other operating expenses Rs.4,100

You are required to:

(i) Estimate the amount of funds generated during the year.

(ii) If the amount of depreciation increases to Rs.9,000 what would be its effect on funds generated during the year.

(iii) Under what circumstances can the funds from operation be zero?

Key Q.No.5: (i) Rs.900; (ii) Rs.900; (iii) When other operating expenses are increased to Rs.5,000 or sales decreased to Rs.4,100 without any decrease in other operating expenses.

6. From the following balance sheets of Damodar Ltd. as on 31st December 2010 and 2011 you are required to prepare:

(i) A schedule of changes in working capital

(ii) A funds flow statement

Assets		**2010**	**2011**
Goodwill		12,000	12,000
Building		40,000	36,000
Plant		37,000	36,000
Investments		10,000	11,000
Stock		30,000	23,400
Bills Receivable		2,000	3,200
Debtors		18,000	19,000
Cash at Bank	6,600	15,200	
1,55,600	1,55,800		

Liabilities	**2010**	**2011**
Share capital	1,00,000	1,00,000
General Reserve	14,000	18,000
Creditors	8,000	5,400
Bills Payable	1,200	800
Provision for Taxation	16,000	18,000
Provision for doubtful debts	400	600
Profit & Loss A/c	16,000	13,000
	1,55,600	1,55,800

Additional information:

(i) Depreciation charged on plant was Rs.4,000 and on building Rs.4,000.

(ii) Provision for taxation Rs.19,000.

(iii) Interim dividend of Rs.8,000 was paid during the year 2011.

Q.No.6: Increase in working capital Rs.5,000; Funds from Operations Rs.17,000.

7. The financial position of Subhulakshmi Ltd. on 1-1-2011 and 31-12-2011 was as follows:

Liabilities	2010 Rs.	2011 Rs.	Assets	2010 Rs.	2011 Rs.
Current Liabilities	72,000	82,000	Cash	8,000	7,200
Loan from Rosary Ltd.		40,000	Debtors	70,000	76,800
			Stock	50,000	44,000
Loan from Gayatri Ltd.	60,000	50,000	Land	40,000	60,000
			Buildings	1,00,000	1,10,000
Capital & Reserves	2,96,000	2,98,000	Machinery	1,60,000	1,72,000
	4,28,000	4,70,000		4,28,000	4,70,000

During the year Rs.52,000 were paid as dividends. The provision for depreciation against machinery as on 1-1-2011 was Rs.54,000 and on 31-12-2011 was Rs.72,000. Prepare a Cash Flow Statement.

Q.No.7: Funds from Operations Rs.72,000; Cash from Operations Rs.81,200.

8. Given below are the Balance Sheets of Bharathy Ltd. for a period of three years as at 31st March each. Rs. in Lakhs

	2010	2011	2012
Liabilities			
Share capital in equity shares of Rs.10 each	30	35	35
General Reserve	10	15	18
Surplus	5	8	9
13% Debentures	10	5	10
Bank Credit	5	10	15
Trade Creditors	10	12	15
Income Tax Provision	8	11	14
Proposed Dividend	6	10.5	14
	84	106.5	130
Assets			
Plant and Machinery	45	55	70
Investments	10	15	20
Stock	12	15	15
Debtors	14	15	12
Cash and Bank	3	6.5	13
	84	106.5	130

Other Details:

(a) Depreciation provided in the books:

2009-10: Rs.6 lakhs; 2010-11: Rs.8 lakhs; 2011-12: Rs.10 lakhs

(b) A part of the Debentures was converted into equity at par in September 2010.

(c) There was no sale of fixed assets during the period.

As you are the Management Accountant of the concern, the management seeks your advice on the liquidity position of the company. Analyse the case and advice the management using Funds Flow Analysis.

Hint: (i) Calculate Funds from Operations.

(ii) Prepare Schedule of Changes in Working Capital.

(iii) Prepare Funds Flow Statement.

(iv) Calculate Current Ratio and Liquidity Ratio.

Based on the above workings suitable advice may be given to the management.

09. **The following are the summarized** Balance Sheet of Surya Ltd as on 31st March 2000 and 2001:

LIABILITIES	2000 Rs.	2001 Rs.	**ASSETS**	2000 Rs.	2001 Rs.
Equity Capital	2,00,000	2,60,000	Goodwill	---	20,000
General Reserve	50,000	50,000	Plant &Machinery	1,12,950	1,16,200
Profit & Loss account	39,690	41,220	Land & Building	1,48,500	1,44,250
Bills Payable	33,780	11,525	Stock	1,11,040	97,370
Sundry creditors	39,500	41,135	Sundry advances	2,315	735
Overdraft	59,510	---	Debtors	85,175	72,625
Provision for Taxation	40,000	50,000	Cash	2,500	2,700
	4,62,480	4,53,880		4,62,480	4,53,880

(i) During the year ended 31st March 2001 an interim dividend of Rs.26,000 was paid.

(ii) Income tax paid during the year Rs.25,000 and the net profit for the year before tax was Rs.62,500.

Prepare Funds Flow Statement

10. **The following are the comparative** balance sheets of XYZ Ltd., as on 31st March 2008 and 2009.

Liabilities	**2008**	**2009**	**Assets**	**2008**	**2009**
Share Capital (Shares of Rs.10 each)	3,50,000	3,70,000	Land	1,00,000	1,50,000
Profit & Loss A/c	50,400	52,800	Stocks	2,46,000	2,13,500
9% Debentures	60,000	30,000	Goodwill	50,000	25,000
Creditors	51,600	59,200	Cash and Bank	42,000	35,000
			Temporary Investments	3,000	4,000
			Debtors	71,000	84,500
	5,12,000	**5,12,000**		**5,12,000**	**5,12,000**

Other particulars Provided to you are: 1) Dividends declared and paid during the year Rs.17,500, b) Land was revalued during the year at Rs.1,50,000 and the profit on revaluation transferred to profit and loss account. You are required to prepare a Cash Flow Statement for the ended 31st March 2009.

11. **Following are the comparative Balance** Sheets of Good Luck Co. as at 31st March.

Liabilities	!999 Rs.	2000 Rs.	Assets	1999 Rs.	2000 Rs.
Share capital	10,00,000	11,00,000	Good will	50,000	40,000
Debentures	5,00,000	3,00,000	Land & Build	4,20,000	6,60,000
General reserve	2,00,000	2,00,000	Plant	6,00,000	8,00,000
Profit & Loss	1,10,000	1,90,000	Stocks	2,50,000	2,10,000
Income tax prov.	40,000	1,10,000	Debtors	3,00,000	2,40,000
Creditors	50,000	40,000	Cash	3,00,000	24,000
Bills payable	20,000	30,000	Preliminary expenses	30,000	20,000
Provision for Doubtful debts	30,000	24,000			
	19,50,000	19,94,000		19,50,000	19,94,000

Additional Information:

a) Dividend for Rs.1, 00,000 was paid during the year ended 31st December 2000.

b) Depreciation for the year 2000 was provided as follows;

	Rs.
Land and Building	10,000
Plant and machinery	50,000

c) Income tax Rs.50,000 was paid during the year 2000.

You are required to prepare:

a) A Schedule of change in working capital and

b) A Statement showing the sources and Application of Funds.

12. **The following are the summarized** Balance Sheet of Surya Ltd as on 31st March 2000 and 2001:

LIABILITIES	2000 Rs.	2001 Rs.	ASSETS	2000 Rs.	2001 Rs.
Equity Capital	2,00,000	2,60,000	Goodwill	---	20,000
General Reserve	50,000	50,000	Plant &Machinery	1,12,950	1,16,200
Profit & Loss account	39,690	41,220	Land & Building	1,48,500	1,44,250
Bills Payable	33,780	11,525	Stock	1,11,040	97,370
Sundry creditors	39,500	41,135	Sundry advances	2,315	735
Overdraft	59,510	---	Debtors	85,175	72,625
Provision for Taxation	40,000	50,000	Cash	2,500	2,700
	4,62,480	4,53,880		4,62,480	4,53,880

(iii) During the year ended 31st March 2001 an interim dividend of Rs.26,000 was paid.

(iv) The assets of another company were purchased for RS.60,000 payable in fully paid shares of the company. These assets consisted of stock Rs.21,640, Machinery Rs.18,360 and Goodwill Rs.20,000. In addition plant were purchased for Rs.5,650.

(v) Income tax paid during the year Rs.25,000

(vi) The net profit for the year before tax was Rs.62,500.

Prepare Funds Flow Statement

13. **Prepare a Fund Flow Statement** from the following data:

BALACE SHEET AS ON 31ST March

LIABILITIES	2002 Rs.	2003 Rs.	ASSETS	2002 Rs.	2003 Rs.
Capital Stock	35,000	43,500	Cash	40,000	44,400
Provision for Tax	22,000	22,000	Accounts Receivable	10,000	20,700
Retained Earnings	15,000	19,500	Inventories	12,000	14,000
Land &Buildings	24,000	20,000			
Current liabilities	30,000	32,000	Equipment	16,000	17,900
	1,02,000	1,17,000		1,02,000	1,17,000

Additional Information:

a) The depreciation charge for the period was Rs.800;
b) Cash dividend of Rs.2, 000;

c) Tax paid Rs.1,000.

14. Following are the comparative Balance Sheets of Good Luck Co. as at 31st March.

Liabilities	!999 Rs.	2000 Rs.	Assets	1999 Rs.	2000 Rs.
Share capital	10,00,000	11,00,000	Good will	50,000	40,000
Debentures	5,00,000	3,00,000	Land & Build	4,20,000	6,60,000
General reserve	2,00,000	2,00,000	Plant	6,00,000	8,00,000
Profit & Loss	1,10,000	1,90,000	Stocks	2,50,000	2,10,000
Income tax prov.	40,000	1,10,000	Debtors	3,00,000	2,40,000
Creditors	50,000	40,000	Cash	3,00,000	24,000
Bills payable	20,000	30,000	Preliminary expenses	30,000	20,000
Provision for Doubtful debts	30,000	24,000			
	19,50,000	19,94,000		19,50,000	19,94,000

Additional Information:

d) Dividend for Rs.1, 00,000 was paid during the year ended 31st December 2000.

e) Depreciation for the year 2000 was provided as follows;

	Rs.
Land and Building	10,000
Plant and machinery	50,000

f) Income tax Rs.50,000 was paid during the year 2000.

You are required to prepare:

c) A Schedule of change in working capital and

d) A Statement showing the sources and Application of Funds.

15. **The following are the summarized Balance Sheet** of Shankar Ltd as on 31st March 2000 and 2001. Prepare a cash flow statement.

LIABILITIES	2000 Rs.	2001 Rs.	**ASSETS**	2000 Rs.	2001 Rs.
Share Capital	8,000	8,500	Land	5,000	5,000
Profit & Loss account	1,450	2,450	Plant &Machinery	2,400	3,400
Mortgage Loan	--	500	Stock	900	700
Sundry creditors	900	500	Debtors	1,650	1,950
			Cash	400	900
	10,350	11,950		10,350	11,950

Prepare a Fund Flow Statement from the following data:

BALACE SHEET AS ON 31ST March

LIABILITIES	2002 Rs.	2003 Rs.	ASSETS	2002 Rs.	2003 Rs.
Capital Stock	35,000	43,500	Cash	40,000	44,400
Provision for Tax	22,000	22,000	Accounts Receivable	10,000	20,700
Retained Earnings	15,000	19,500	Inventories	12,000	14,000
Land &Buildings	24,000	20,000			
Current liabilities	30,000	32,000	Equipment	16,000	17,900
	1,02,000	1,17,000		1,02,000	1,17,000

Additional Information:

a) A Building that cost Rs4, 000 and which and a book value of Rs1, 000 is sold for Rs.1, 400; (b)The depreciation charge for the period was Rs.800;(c) Cash dividend of Rs.2, 000;(d)Tax paid Rs.1,000.

16. **The following details are available from a company.**

	31-3-06 ₹	**31-3-07** ₹		**31-3-06** ₹	**31-3-07** ₹
Share Capital	70,000	74,000	Cash	9,000	7,800
Debentures	12,000	6,000	Debtors	14,900	17,700
Reserve for doubtful debts	700	800	Stock	49,200	42,700
Trade Creditors	10,360	11,840	Land	20,000	30,000
P/L A/c	10,040	10,560	Goodwill	10,000	5,000
	1,03,100	1,03,200		1,03,100	1,03,200

In addition, you are given:

1) Dividend paid total ₹.3,500.
2) Land was purchased for ₹.10,000.
3) Amount provided for amortisation of goodwill ₹.5,000.
4) Debentures paid off ₹.6,000.

Prepare Fund Flow Statement.

17. **The following are the summarized Balance** Sheet of Surya Ltd as on 31st March 2000 and 2001:

LIABILITIES	2000 ₹.	2001 ₹.	ASSETS	2000 ₹	2001 ₹
Equity Capital	2,00,000	2,60,000	Goodwill	---	20,000
General Reserve	50,000	50,000	Plant &Machinery	1,12,950	1,16,200
Profit & Loss account	39,690	41,220	Land & Building	1,48,500	1,44,250
Bills Payable	33,780	11,525	Stock	1,11,040	97,370
Sundry creditors	39,500	41,135	Sundry advances	2,315	735
Overdraft	59,510	---	Debtors	85,175	72,625
Provision for Taxation	40,000	50,000	Cash	2,500	2,700
	4,62,480	4,53,880		4,62,480	4,53,880

(i) During the year ended 31st March 2001 an interim dividend of ₹.26,000 was paid.

(ii) The assets of another company were purchased for ₹.60,000 payable in fully paid shares of the company. These assets consisted of stock ₹.21,640, Machinery ₹.18,360 and Goodwill ₹.20,000. In addition plant were purchased for ₹.5,650.

(iii) Income tax paid during the year ₹.25,000

(iv) The net profit for the year before tax was ₹.62,500.

Prepare Funds Flow Statement

18. **Following are the comparative Balance Sheets** of Good Luck Co. as at 31st March.

Liabilities	!999 Rs.	2000 Rs.	Assets	1999 Rs.	2000 Rs.
Share capital	10,00,000	11,00,000	Good will	50,000	40,000
Debentures	5,00,000	3,00,000	Land & Build	4,20,000	6,60,000
General reserve	2,00,000	2,00,000	Plant	6,00,000	8,00,000
Profit & Loss	1,10,000	1,90,000	Stocks	2,50,000	2,10,000
Income tax prov.	40,000	1,10,000	Debtors	3,00,000	2,40,000
Creditors	50,000	40,000	Cash	3,00,000	24,000
Bills payable	20,000	30,000	Preliminary expenses	30,000	20,000
Provision for Doubtful debts	30,000	24,000			
	19,50,000	19,94,000		19,50,000	19,94,000

Additional Information:

g) Dividend for Rs.1, 00,000 was paid during the year ended 31st December 2000.
h) Depreciation for the year 2000 was provided as follows;

	Rs.
Land and Building	10,000
Plant and machinery	50,000

i) Income tax Rs.50,000 was paid during the year 2000.

You are required to prepare:

e) A Schedule of change in working capital and
f) A Statement showing the sources and Application of Funds.

19. The following are the comparative balance sheets of Mathavan Ltd., as on 31st March 2011 and 2012.

Liabilities	**20011 ₹**	**2012 ₹**	**Assets**	**2011 ₹**	**2012 ₹**
Share Capital (Shares of Rs.10 each)	3,50,000	3,70,000	Land	1,00,000	1,50,000
Profit & Loss A/c	50,400	52,800	Stocks	2,46,000	2,13,500
9% Debentures	60,000	30,000	Goodwill	50,000	25,000
Creditors	51,600	59,200	Cash and Bank	42,000	35,000
			Temporary Investments	3,000	4,000
			Debtors	71,000	84,500
	5,12,000	**5,12,000**		**5,12,000**	**5,12,000**

Other particulars provided to you are: 1) Dividends declared and paid during the year ₹17,500, 2) Land was revalued during the year at ₹.1,50,000 and the profit on revaluation transferred to profit and loss account. You are required to prepare a Fund Flow Statement for the ended 31st March 2012.

Lesson 5.1 Contemporary Issues – Emerging Costing Techniques

Learning Objectives:

After learning this lesson, you are able to know:

- Value chain analysis (VCA)
- Michael Porter's Value Chain
- Activity Based Costing(ABC)
- Significance of ABC and Steps involved in ABC Technique
- Benefits and Drawback of ABC
- Advantages and Disadvantages of Adopting Just-In-Time Manufacturing
- Precautions in Implementing a Just-In-Time Manufacturing System
- Meaning and Principles, Advantages and disadvantages of Target Costing
- Life-cycle Costing
- Back Flush costing
- Throughput Costing

Contents:

- Introduction
- **Value chain analysis** (VCA)
- **Michael Porter's Value Chain**
- Meaning, Definition and Significance of ABC
- Steps in ABC, Benefits and Drawback of ABC
    - Just-In-Time Manufacturing: Meaning, Advantages and Disadvantages
    - Precautions in Implementing a Just-In-Time Manufacturing System
- Introduction to Target costing
- Advantages & Disadvantages:
- Life-cycle costing systems
- Back Flush costing
- Advantages &Difficulties of Backflush costing:
- Throughput Costing
- Advantages & Difficulties
- Self Assessment Questions:

Introduction

The management control philosophy and devices will obviously depend upon the management culture whether it is decentralized or centralized. In big business units, decentralization paves the way for divisions with restrictive autonomy on certain functions. In a centralized system, no major decision is left to the manager alone. The plans are laid down by top management in consultation with the manager. The manager is expected to perform as per plans and budgets. Normally, the managers under centralized system are judged very strictly and if the net result fall short of the budgeted or promised results, they will have to account for the same.

The changing size and magnitude of the business units poses various issues in decision accounting which will have bearing on vital decisions. The various contemporary issues are centered on scaling of operations, emergence of many management concepts and new costing concepts and techniques. The performance of evaluation measures of a corporate body is also being evolved so as to suit time needs. Hence, it is very much for the corporate managers and accountants to acquire the knowledge about contemporary issues and update themselves.

Financial executives have to take various decisions from time to time to plan and to control the financial resources of the firm to gain competitive advantages and gaining edge over their competitors. Cost rules the world in globally competitive environment. Emerging accounting concepts helps a lot to exercise cost control without compromising quality and time as also the key factors. A brief description about **Value Chain Analysis, Activity Based Costing, Transfer Pricing, Target and Life-cycle costing, Back-flush costing and Throughput accounting (TA).**

Similarly, few emerging management concepts to ensure the effective performance evaluation of the corporate in line global benchmarking performance standards. Knowledge on these concepts helps the decision-makers to adopt best practices ensure utmost performance of the organization. This in turn will help them to face the global business challenges and thrive efficiently. Hence, a brief description about **Total Quality Management(TQM), Six sigma, Just in Time(JIT) and Balanced Score Card.**

Value Chain Analysis

Value chain analysis (VCA) is a process where a firm identifies its primary and support activities that add value to its final product and then analyse these activities to reduce costs or increase differentiation. It ascertains **how much and at which stage value is added** to its goods and/or services, and how it can be increased to enhance the product differentiation.

VCA is a strategy tool used to analyze internal firm activities. Its goal is to recognize, which activities are the most valuable (i.e. are the source of cost or differentiation advantage) to the firm and which ones could be improved to provide competitive advantage. In other words, by looking into internal activities, the analysis reveals where a firm's competitive advantages or disadvantages are. The firm that competes through differentiation advantage will try to perform its activities better than competitors would do. If it competes through cost advantage, it will try to perform internal activities at lower costs than competitors would do. When a company is capable of producing goods at lower costs than the market price or to provide superior products, it earns profits.

Although, primary activities add value directly to the production process, they are not necessarily more important than support activities. Nowadays, competitive advantage mainly derives from technological improvements or innovations in business models or processes. Therefore, such support activities as 'information systems', 'R&D' or 'general management' are usually the most important source of differentiation advantage. On the other hand, primary activities are usually the source of cost advantage, where costs can be easily identified for each activity and properly managed.

Michael Porter's Value Chain

The idea of a value chain was first suggested by Michael Porter (1985) to depict how customer value accumulates along a chain of activities that lead to an end product or service.

Porter describes the value chain as the internal processes or activities a company performs "to design, produce, market, deliver and support its product." He further states that "a firm's value chain and the way it performs individual activities are a reflection of its history, its strategy, its approach to implementing its strategy, and the underlying economics of the activities themselves."

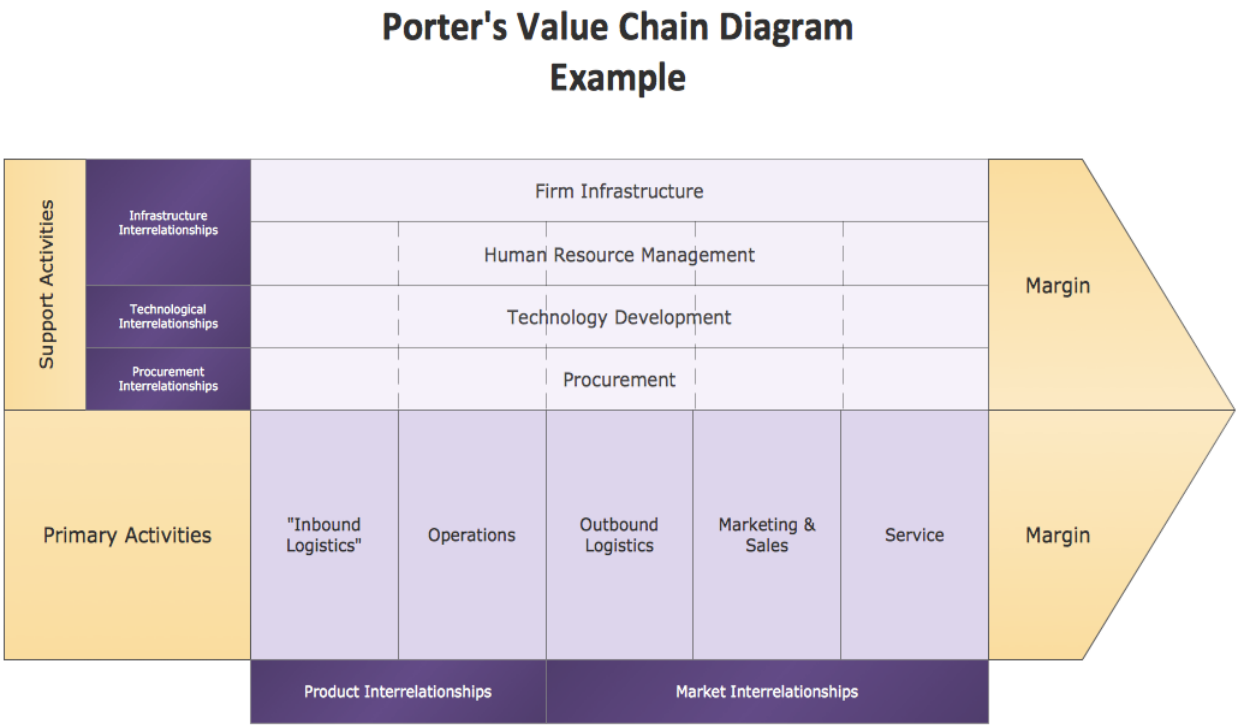
Porter describes two major categories of business activities: primary activities and support activities. Primary activities are directly involved in transforming inputs into outputs and in delivery and after-sales support. These are generally also the line activities of the organization. They include:

- inbound logistics—material handling and warehousing;
- operations—transforming inputs into the final product;
- outbound logistics—order processing and distribution;
- marketing and sales—communication, pricing and channel management; and
- service—installation, repair and parts.

Support activities support primary activities and other support activities. They are handled by the organization's staff functions and include:

- procurement—purchasing of raw materials, supplies and other consumable items as well as assets;
- technology development—know-how, procedures and technological inputs needed in every value chain activity;
- human resource management—selection, promotion and placement; appraisal; rewards; management development; and labor/employee relations; and
- firm infrastructure—general management, planning, finance, accounting, legal, government affairs and quality management.

Value chain analysis is a team effort. Management accountants need to collaborate with engineering, production, marketing, distribution and service professionals to focus on the strengths, weaknesses, opportunities and threats identified in the value chain analysis results. By championing the use of value chain analysis, the management accountant enhances the firm's value and demonstrates the value of the finance staff to the firm's growth and survival.



The way that the value chain approach helps organizations assess competitive advantage is through the following types of analysis:

● **Internal cost analysis**—to determine the sources of profitability and the relative cost positions of internal value-creating processes;

● **Internal differentiation analysis**—to understand the sources of differentiation (including the cost) within internal value-creating processes; and

● **Vertical linkage analysis**—to understand the relationships and associated costs among external suppliers and customers in order to maximize the value delivered to customers and to minimize cost.

These types of analysis are not mutually exclusive. Rather, firms begin by focusing on their internal operations and gradually widen their focus to consider their competitive position within their industry.

Activity Based Costing (ABC)

Introduction

An accounting method that identifies the activities that a firm performs, and then assigns indirect costs to products. An activity based costing (ABC) system recognizes the relationship between costs, activities and products, and through this relationship assigns indirect costs to products less arbitrarily than traditional methods.

ABC is a costing methodology that identifies activities in an organization and assigns the cost of each activity with resources to all products and services according to the actual consumption by each. This model assigns more indirect costs (overhead) into direct costs compared to conventional costing.

CIMA (Chartered Institute of Management Accountants) defines ABC as an approach to the costing and monitoring of activities which involves tracing resource consumption and costing final outputs. Resources are assigned to activities, and activities to cost objects based on consumption estimates. The latter utilize cost drivers to attach activity costs to outputs.

Activity based costing is a method for assigning costs to products, services, projects, tasks, or acquisitions, based on the activities that go into them and the resources consumed by these activities.

Significance of ABC Technique

This contrasts with traditional costing, which sometimes assigns costs using somewhat arbitrary allocation percentages for overhead or the so-called indirect costs. **Activity based management ABM** is a managerial approach that uses ABC for decision support and planning.

Management is moved to adopt ABC by the desire to improve costing accuracy—get closer to the true cost and true profitability—of individual products and services, or to understand better the true costs and return on investment from projects or other initiatives. ABC gets closer to true costs in these areas by turning many costs that traditional cost accounting treats as indirect costs essentially into direct costs. Examples below show how this is done.

In organizations where ABC has been implemented successfully, activity based management uses the approach to support decisions about pricing, adding or deleting items from the product portfolio, choosing between outsourcing and in-house production, and evaluating process improvement initiatives.

The percentage of organizations currently using activity based costing varies greatly from industry to industry. Various surveys in the period 2010-2014 report the highest percentage of organizations using ABC in manufacturing (20%-50%), followed by financial services (15-25%), public sector (12-18%), and communications (6-12%).

Steps in development of an ABC System

ABC uses cost drivers to assign the costs of resources to activities and unit cost as a way of measuring an output. There are four steps to implementing ABC.

1. **Identify activities**: The organisation needs to undertake an in-depth analysis of the operating processes of each responsibility centre. Each process might consist of one or more activities required producing an output.

2. **Assign resource costs to activities:** This involves tracing costs to cost objects to determine why the cost occurred. Costs can be categorised in three ways: i. Direct – costs that can be traced directly to one output. For example, the wood and paint that it takes to make a chair. ii. Indirect – costs that cannot be allocated to an individual output, that is, they benefit two or more outputs, but not all outputs. For example, maintenance costs or storage costs. iii. General/administration – costs that cannot be associated with any product or service. These costs are likely to remain unchanged, whatever output is produced. For example, salaries of administration staff, security costs or depreciation.

3. Identify outputs: Identify all of the output for which an activity segment performs activities and consumes resources. Outputs might be products, services or customers.

4. Assign activity costs to outputs: This is done using activity drivers. Activity drivers assign activity costs to outputs (cost objects) based on the consumption or demand for activities.

Cost Drivers:

An activity is a unit of work. A cost driver is an activity, which generates costs. It is a factor, such as the level of activity or volume, that casually affects costs . Cost drivers signify factors forces or events that determine the cost of activities. Cost drives are of Structural cost drivers, Organisational cost drivers and activity cost drivers. Any cost that is traced to a particular product via its consumption of activity becomes direct cost of the product. The functional managers identify five activities that need to occur in order to determine activity costs, such as analyse activities, gather costs, trace costs to activities, establish output measures and analyse costs.

Benefits of ABC

• ABC provides a more accurate method of costing of products and services.

• It allows for a better and more comprehensive understanding of overheads and what causes them to occur.

• It makes costly and non-value adding activities more visible, so allowing managers to focus on these areas to reduce or eliminate them.

• It supports other management techniques such as continuous improvement, scorecards and:: performance management.

Drawbacks of ABC

• ABC can be difficult and time consuming to collect the data about activities and cost drivers.
• It can be costly to implement, run and manage an ABC system.
• Even in ABC some overhead costs are difficult to assign to products and customers. These costs still have to be arbitrarily applied to products and customers.

Summary

ABC is an accounting technique that allows an organization to determine the actual cost associated with each product and the service produced by the organization ABC aims at identifying as many costs as possible to subsequently, accounts costs of production. ABC is widely adopted in

manufacturing organization where direct costs and indirect costs are likely to be matched in a small proportion to total costs. In service organization, most of the costs are treated fixed and indirect therefore, irrelevant for most decisions. Earlier, most of the Service organizations were owned by government under strict regulations and protection. Hence, they were not under any pressure to improve profitability by eliminating non-value added or non-profit activities. However, in the present day competitive environment, the service organizations need to have cost and management accounting system which can help them to accurately measure cost and the resulting profitability for their services, customers and markets. Therefore, ABC would prove advantageous to service organizations.

DEFINITION of 'Just In Time - JIT'

An inventory strategy companies employ to increase efficiency and decrease waste by receiving goods only as they are needed in the production process, thereby reducing inventory costs.

Introduction

Just-in-time manufacturing was a concept introduced to the United States by the Ford motor company. It works on a demand-pull basis, contrary to hitherto used techniques, which worked on a production-push basis.

To elaborate further, under just-in-time manufacturing (colloquially referred to as JIT production systems), actual orders dictate what should be manufactured, so that the exact quantity is produced at the exact time that is required.

Just-in-time manufacturing goes hand in hand with concepts such as Kanban, continuous improvement and total quality management (TQM).

Just-in-time production requires intricate planning in terms of procurement policies and the manufacturing process if its implementation is to be a success.

Highly advanced technological support systems provide the necessary back-up that Just-in-time manufacturing demands with production scheduling software and electronic data interchange being the most sought after.

Advantages Just-In-Time Systems

Following are the advantages of Adopting Just-In-Time Manufacturing Systems

- Just-in-time manufacturing keeps stock holding costs to a bare minimum. The release of storage space results in better utilization of space and thereby bears a favorable impact on the rent paid and on any insurance premiums that would otherwise need to be made.
- Just-in-time manufacturing eliminates waste, as out-of-date or expired products; do not enter into this equation at all.
- As under this technique, only essential stocks are obtained, less working capital is required to finance procurement. Here, a minimum re-order level is set, and only once that mark is reached, fresh stocks are ordered making this a boon to inventory management too.
- Due to the aforementioned low level of stocks held, the organizations return on investment (referred to as ROI, in management parlance) would generally be high.
- As just-in-time production works on a demand-pull basis, all goods made would be sold, and thus it incorporates changes in demand with surprising ease. This makes it especially appealing today, where the market demand is volatile and somewhat unpredictable.
- Just-in-time manufacturing encourages the 'right first time' concept, so that inspection costs and cost of rework is minimized.
- High quality products and greater efficiency can be derived from following a just-in-time production system.
- Close relationships are fostered along the production chain under a just-in-time manufacturing system.
- Constant communication with the customer results in high customer satisfaction.
- Overproduction is eliminated when just-in-time manufacturing is adopted.

Disadvantages

Following are the disadvantages of Adopting Just-In-Time Manufacturing Systems

- Just-in-time manufacturing provides zero tolerance for mistakes, as it makes re-working very difficult in practice, as inventory is kept to a bare minimum.
- There is a high reliance on suppliers, whose performance is generally outside the purview of the manufacturer.
- Due to there being no buffers for delays, production downtime and line idling can occur which would bear a detrimental effect on finances and on the equilibrium of the production process.
- The organization would not be able to meet an unexpected increase in orders due to the fact that there are no excess finish goods.
- Transaction costs would be relatively high as frequent transactions would be made.
- Just-in-time manufacturing may have certain detrimental effects on the environment due to the frequent deliveries that would result in increased use of transportation, which in turn would consume more fossil fuels.

Precautions

Following are the things to remember when implementing a Just-In-Time Manufacturing System

- Management buy-in and support at all levels of the organization are required; if a just-in-time manufacturing system is to be successfully adopted.
- Adequate resources should be allocated, so as to obtain technologically advanced software that is generally required if a just-in-time system is to be a success.
- Building a close, trusting relationship with reputed and time-tested suppliers will minimize unexpected delays in the receipt of inventory.

- Just-in-time manufacturing cannot be adopted overnight. It requires commitment in terms of time and adjustments to corporate culture would be required, as it is starkly different to traditional production processes.
- The design flow process needs to be redesigned and layouts need to be re-formatted, so as to incorporate just-in-time manufacturing.
- Lot sizes need to be minimized.
- Workstation capacity should be balanced whenever possible.
- Preventive maintenance should be carried out, so as to minimize machine breakdowns.
- Set-up times should be reduced wherever possible.
- Quality enhancement programs should be adopted, so that total quality control practices can be adopted.
- Reduction in lead times and frequent deliveries should be incorporated.
- Motion waste should be minimized, so the incorporation of conveyor belts might prove to be a good idea when implementing a just-in-time manufacturing system.

Summary

Just-in-time manufacturing is a philosophy that has been successfully implemented in many manufacturing organizations.

It is an optimal system that reduces inventory whilst being increasingly responsive to customer needs, this is not to say that it is not without its pitfalls.

However, these disadvantages can be overcome with a little forethought and a lot of commitment at all levels of the organization.

Target and Lifecycle costing

Introduction

Target costing is a method to determine the cost at which a product with specified parameters must be produced to generate the required rate of return. It involves cost analysis during the developmental phase as well to keep the overall costs below the threshold. The cost control techniques currently used by the company are useful in managing costs during production stage. However, moving cost management efforts from the production stage to the product development stage translates into higher profits because of lower costs. This is particularly useful for companies producing mobile phones for supermarkets because supermarkets drive tougher bargains.

The benefits of target costing are higher if specific targets for costs and product features are established earlier in the product development cycle. Cost analysis in earlier stages of the product development may indicate whether it is feasible to produce a mobile phone that not only meet customers' expectations of price and quality but also generates the desired returns for Lets communicate Ltd. Also, modifications to the product in the initial development stages cost less and will increase the company's profit and ability to compete better.

However, the target costing concept will take lower priority if Lets communicate were to focus on meeting fast time-to-market demands because of shorter time to launch a mobile phone. It is also difficult to forecast price in the future due to rapid technology developments in mobile phones and changes in customer preferences.

Advantages:

(a) By describing costs in a proactive and future-oriented manner, managers can determine how they should alter product designs before they enter the manufacturing process in order to ensure that the company earns a reasonable profit on all new products.

(b) To use this methodology, a cost accountant is assigned to a new product design team, and asked to continually compile the projected cost of a product as it moves through the design process. Managers will use this information not only to make product alterations, but also to drop a product design if it cannot meet its cost targets.

(c) This costing methodology is the most proactive of all the methodologies, for it involves the direct intervention of the cost accounting staff in the product design process, with the express intent of creating products that meet preset cost and gross margin goals. This is opposed to the usual practice of accumulating costs after products have been designed and manufactured, so that managers will find out what a product costs after it is too late to make any changes to the design.

(d) This costing system is highly recommended to any company that designs its own products, since it can result in significant reductions in product costs before they are "locked in" when the design is completed.

Disadvantages:

This technique usually requires a great deal of cost accounting staff time, and can lengthen the product development process, but is well worth the effort.

Life-cycle costing systems

The competitive nature of the mobile sector means that mobile producers have to not only manage with lower profit margins and shorter product life but also spend a significant amount on developing new products and features. This means that costing methods like absorption costing systems that only look at production costs are less useful because they neglect research and development costs in evaluating profitability of a product. Life-cycle costing systems overcome this drawback as they evaluate costing from the research and development phase through to the eventual conclusion of a product's life. This approach is useful in determining the overall profits from a product like a mobile phone that has high development costs and a short product life due to new products being launched constantly by competitors.

The major challenge of using the life-cycle costing system is that it would be difficult for Lets communicate to estimate full life-cycles of a mobile phone in a rapidly changing environment and increasing competition.

There are four principal lessons to be learned from lifecycle costing:

- All costs should be taken into account when working out the cost of a unit and its profitability.

- Attention to all costs will help to reduce the cost per unit and will help an organisation achieve its target cost.
- Many costs will be linked. For example, more attention to design can reduce manufacturing and warranty costs. More attention to training can machine maintenance costs. More attention to waste disposal during manufacturing can reduce end-of life costs.
- Costs are committed and incurred at very different times. A committed cost is a cost that will be incurred in the future because of decisions that have already been made. Costs are incurred only when a resource is used.

Life-cycle costing is the profiling of costs over the life of a product, including the pre-production stage.

- Unlike traditional management accounting systems, which are based on financial years, life-cycle costing tracks and accumulates the costs and revenues attributable to the product over the full life cycle, which may last for many years.

- Target costing is an activity which is aimed at reducing the life-cycle costs of new products, by examining all possibilities for cost reduction at the research, development and production stage.

- It is not a costing system, but a profit-planning system – the selling price and profit requirement are set during the research stage, thus creating a target cost.

- The product is then developed and produced in such a way as to achieve this cost.

Target costing is very much a marketing approach to costing. The Chartered Institute of Marketing defines marketing as: *'The management process responsible for identifying, anticipating and satisfying customer requirements profitably.'*

As mentioned above, target costing places great emphasis on controlling costs by good product design and production planning, but those up-front activities also cause costs. There might be other costs incurred after a product is sold such as warranty costs and plant decommissioning. When seeking to make a profit on a product it is essential that the total revenue arising from the product exceeds total costs, whether these costs are incurred before, during or after the product is produced.

This is the concept of life cycle costing, and it is important to realise that target costs can be driven down by attacking any of the costs that relate to any part of a product's life. The cost phases of a product can be identified as:

PHASE	EXAMPLES OF TYPES OF COST
Design	Research, development, design and tooling
Manufacture	Material, labour, overheads, machine set up, inventory, training, production machine maintenance and depreciation
Operation	Distribution, advertising and warranty claims
End of life	Environmental clean-up, disposal and decommissioning

Target costing overcomes some of the drawbacks of the current costing and performance techniques used by Lets communicate as it focuses on maximum allowable costs during the development phase so that the company can generate the required returns. Life-cycle costing is useful as it will incorporate high development costs and short product life in determining the feasibility of a product.

Back Flush costing: A way to account for the cost of inventory in a just-in--time system. In backflush costing, no costs are accounted until a product isfinished. After it is finished, costs are assigned over a period between the time product construction began and the time it finishe d.That is, costs are "flushed" back into the past. This is useful when a company has low inventor y because it is simpler than trackingcosts as they occur. A product costing system, generally used in a just-in-time inventory environment. Backflush costing delays the costing process until the production of goods is completed. Costs are then "flushed" back at the end of the production run and assigned to the goods. This eliminates the detailed tracking of costs throughout the production process, which is a feature of traditional costing systems.

Method of costing a product that works backwards: standard costs are allocated to finished products on the basis of the output of a repetitive manufacturing process. Used where inventory is kept at minimum (as in 'just in time' operations) this method obviates

the need for detailed cost tracking required in absorption costing, and usually eliminates separate accounting for work-in-process. It is also called backflush accounting.

Advantages of back-flush costing:

(a) This costing system would discourage managers from producing unnecessarily output for mere inventory piling since work-in-process does not add value until the finished product is completed or sold.

(b) In Backflush costing, the number of accounting entries required would significantly be reduced. Likewise, the supporting vouchers, documents and other things would also be reduced.

(c) Backflush costing is much simpler than any other methods since there is no separate accounting for work-in-process.

(d) Lower inventory results lower payment of financial cost of inventories.

(e) Maintenance issues relating to material inventory relief huge workforce to work on productive activities, thus saves money.

Backflush costing is the reversal of traditional costing, where traditional costing flow from accounting of inputs to outputs but backflush starts accounting only from outputs and then works back to apply manufacturing costs to units sold and to inventories. In this, cost of inventories is at the time of sale only. Costs are then flushed back through the accounting system. It is attractive for low inventory companies which results from JIT.

Difficulties of Backflush costing:

i) It does not strictly adhere to generally accepted accounting principles of external reporting.

ii) Absence of audit trails leads to critics.

iii) It does not pinpoint the use of resources at each step of the production process.

iv) It is suitable only for JIT production system with virtually no direct material inventory and minimum WIP inventories. It is less feasible otherwise.

Throughput Costing

A variation on direct costing is throughput costing. A costing methodology that focuses on capacity utilization is called throughput accounting. It assumes that there is always one bottleneck operation in a production process that governs the speed with which products or services can be completed.

This operation becomes the defining issue in determining what products should be manufactured first, since this in turn results in differing levels of profitability.

This methodology holds that the only direct cost is direct materials, with even direct labor costs being thrown out when making most cost-related management decisions.

Throughput costing is also known as super-variable costing. Throughput costing considers only direct materials as true variable cost and other reaming costs as period costs to be charged in the period in which they are incurred. Thus, in throughput costing, only direct materials costs are inventoriable costs. In this costing, contribution is equal to revenue minus all variable direct materials cost of goods sold.

Throughput costing is a system whereby only direct material cost is considered as variable and all other costs are treated as “period cost”.

Throughput = Revenue – Purchased Material Cost

Throughput costing is not used for external reporting because it gives significant different net income figures than those revealed by absorption costing. It provides less incentive to produce for inventory than variable or absorption costing since inventory value figures are very low. Throughput costing has relevance only for internal uses of management. To illustrate an example, let's assume Smarter Books Company prints and sells college textbooks. In 2009 the company had $ 2,500,000 in sales. The following information also pertains to the company's operations in 2009:

	Absorption Costing	**Variable Costing**	**Throughput Costing**
Cost of goods sold (COGS)	$ 1,000,000	$ 650,000	$ 500,000
Fixed factory overhead	N/A*	450,000	N/A
Variable SG&A** expenses	300,000	300,000	300,000
Fixed SG&A expenses	200,000	200,000	200,000
Product conversion costs***	N/A	N/A	800,000

Advantages of Throughput Costing

1. Value is not created until products are sold
2. There is no such P&L account as "revenues from production" (i.e. revenues from goods made and stored as inventory)
3. Costs of the not sold production (represented by material costs) are treated as variable and depress the throughput, as well as the throughput accounting ratio.
4. Managers are encouraged to use the bottleneck resource to manufacture products for which there is demand, as in a JIT environment
5. Organizations should adhere to production schedules and it is important to get things right from the first time
6. Total factory costs, overheads should be allocated per products based on the usage of each product of the bottleneck resource.
7. Management and accounting staff should get back to an understanding of what is happening on the shop floor and adapt performance measurements accordingly.

Disadvantages:

This can result in production mixes that seriously delay the completion of jobs for some customers, which is not good for customer relations.

Self Assessment Questions:

1. What is Value Chain Analysis? State its Significance.
2. Discuss the Porter's Value Chain Model. State the different set of activities to carried out under this model.
3. What is ABC costing? State its significance.
4. Explain the steps involved in ABC technique.
5. Discuss the merits and demerits of ABC Costing
6. What is Just-in-time manufacturing
7. Discuss the Advantages and Disadvantages of Just-In-Time System
8. What are the Precautions to be carried out while Implementing a Just-In-Time Manufacturing System
9. Describe briefly, target costing and its cost reduction methods

10. What are the advantages of target costing?
11. Briefy explain the steps involved in the introduction of target costing in an organization.
12. What is **Throughput Costing? State its' Advantages**
13. What is Backflush costing? Discuss its **Advantages and Difficulties of back-flush costing.**

Lesson 5.2. Emerging Organizational Performance Metrics

Learning Objectives:

After studying this lesson you are able to understand:

- The concept of Transfer pricing
- Transfer Pricing in India
- The Arm's Length principle
- Alternative approaches: unitary taxation with profit apportionment
- Main obstacles to unitary taxation:
- Transfer Pricing Policy
- Total Quality Management (TQM)
- Principles of TQM
- Six Sigma Methodologies
- the concept of Balanced Scorecard
- Traditional Management Processes Versus the Balanced Scorecard
- Advantages of the Balanced Scorecard
- Processes involved in Balanced Scorecard
- Advantages and Disadvantages of BSC

Contents

- Introduction
    - The concept of Transfer pricing
    - Transfer Pricing in India
    - The Arm's Length principle
    - Alternative approaches: unitary taxation with profit apportionment
    - Main obstacles to unitary taxation:
- Transfer Pricing Policy
- Evolution of the BSC
- Traditional Management Processes Versus the Balanced Scorecard
- Advantages of the Balanced Scorecard
- Processes involved in Balanced Scorecard
- Balanced Scorecard Strategy Map
- Disadvantages of Balance Scorecard

    - Total Quality Management (TQM)
    - Principles of TQM
    - Six Sigma Methodologies

Introduction

The recent development in the field of decision accounting is the advent of tools and techniques for managerial control. It has assumed greater significance in managerial control and reporting. A brief description about the widely used modern techniques and concepts such as Balanced Score card, Transfer Pricing and the concept of Just-in-Time is given in this lesson.

As companies around the world transform themselves for competition that is based on information, their ability to exploit intangible assets has become far more decisive than their ability to invest in and management of physical assets. Several years ago in recognition of this change the concept of balanced scorecard was introduced. This scorecard provides a framework in which both financial and nonfinancial success measures are linked by the firm's strategy. It served as a complement for financial measures and helped companies to discover its value as the cornerstone of a new strategic management system. This dynamic method offers guidelines and tools that show the practitioners how to measure key value indicators, link the scorecard to overall organizational strategy and effectively communicate learning results to management.

The price at which divisions of a company transact with each other. Transactions may include the trade of supplies or labor between departments. Transfer prices are used when individual entities of a larger multi-entity firm are treated and measured as separately run entities.

In managerial accounting, when different divisions of a multi-entity company are in charge of their own profits, they are also responsible for their own "Return on Invested Capital". Therefore, when divisions are required to transact with each other, a transfer price is used to determine costs. Transfer prices tend not to differ much from the price in the market because one of the entities in such a transaction will lose out: they will either be buying for more than the prevailing market price or selling below the market price, and this will affect their performance.

Transfer pricing is the setting of the price for goods and services sold between controlled (or related) legal entities within an enterprise. For example, if a subsidiary company sells goods to a parent company, the cost of those goods paid by the parent to the subsidiary is the transfer price. Legal entities considered under the control of a single corporation include branches and companies that are wholly or majority owned ultimately by the parent corporation. Certain jurisdictions consider entities to be under common control if they share family members on their boards of

directors. Transfer pricing can be used as a profit allocation method to attribute a multinational corporation's net profit (or loss) before tax to countries where it does business. Transfer pricing results in the setting of prices among divisions within an enterprise.

Transfer Pricing in India

Transfer Pricing in India was introduced in 2001 for curbing tax avoidance by laying down norms for computation of income arising from international transactions or specified domestic transactions("SDTs") having regard to the "arm's length price". The Indian Transfer Pricing Regulations (TP Regulations) comprise Sections 92 to 92F of the Income-tax Act, 1961 ("the Act") and Rules 10A to 10T of the Income Tax Rules, 1962 ('the Rules') which guides computation of the transfer price and suggests detailed documentation procedures.

The Finance Act, 2012 expanded the scope of TP regulations by insertion of a new section 92BA in the Indian Income tax Act, 1961 to include SDTs within its ambit. SDTs would include transactions entered into by domestic related parties, or by an undertaking with another undertaking of the same tax payer. In addition the Finance Act, 2012 also introduced Section 92CC and 92CD read with Rules 10F to 10T and 44GA to provide the Advance Pricing Agreement Regime in the Indian transfer pricing environment.

Key features of the TP Regulations

- every person who has undertaken an international transaction with an associated enterprise shall **maintain information and contemporaneous documentation** as prescribed under the Rules
- every person who has entered into an international transaction during a previous year shall obtain an**Accountant's Report** and furnish such report on or before the filing of the income tax return which is 30th November following the end of the financial year.
- **stringent penalties** have been prescribed for non-adherence to the TP Regulations

An Overview of Transfer Pricing

Commercial transactions between the different parts of the multinational groups may not be subject to the same market forces shaping relations between the two independent firms. One party transfers to another goods or services, for a price. That price is known as "transfer price". This may be

arbitrary and dictated, with no relation to cost and added value, diverge from the market forces. Transfer price is, thus, a price which represents the value of good; or services between independently operating units of an organisation. But, the expression "transfer pricing" generally refers to prices of transactions between associated enterprises which may take place under conditions differing from those taking place between independent enterprises. It refers to the value attached to transfers of goods, services and technology between related entities. It also refers to the value attached to transfers between unrelated parties which are controlled by a common entity.

Suppose a company A purchases goods for 100 rupees and sells it to its associated company B in another country for 200 rupees, who in turn sells in the open market for 400 rupees. Had A sold it direct, it would have made a profit of 300 rupees. But by routing it through B, it restricted it to 100 rupees, permitting B to appropriate the balance. The transaction between A and B is arranged and not governed by market forces. The profit of 200 rupees is, thereby, shifted to the country of B. The goods is transferred on a price (transfer price) which is arbitrary or dictated (200 hundred rupees), but not on the market price (400 rupees).

Thus, the effect of transfer pricing is that the parent company or a specific subsidiary tends to produce insufficient taxable income or excessive loss on a transaction. For instance, profits accruing to the parent can be increased by setting high transfer prices to siphon profits from subsidiaries domiciled in high tax countries, and low transfer prices to move profits to subsidiaries located in low tax jurisdiction. As an example of this, a group which manufactures products in a high tax countries may decide to sell them at a low profit to its affiliate sales company based in a tax haven country. That company would in turn sell the product at an arm's length price and the resulting (inflated) profit would be subject to little or no tax in that country. The result is revenue loss and also a drain on foreign exchange reserves

Transfer Pricing Background

Transfer pricing is one of the most important issues in international tax.

"Transfer pricing is the leading edge of what is wrong with international tax" – **Lee Sheppard**, Tax Analysts, August 2012

Transfer pricing happens whenever two companies that are part of the same multinational group trade with each other: when a US-based subsidiary of Coca-Cola, for example, buys something

from a French-based subsidiary of Coca-Cola. When the parties establish a price for the transaction, this is transfer pricing.

Transfer pricing is not, in itself, illegal or necessarily abusive. What is illegal or abusive is transfer mispricing, also known as transfer pricing manipulation or abusive transfer pricing. (Transfer mispricing is a form of a more general phenomenon known as trade mispricing, which includes trade between unrelated or apparently unrelated parties – an example is **reinvoicing**.)

It is estimated that about 60 percent of international trade happens within, rather than between, multinationals: that is, across national boundaries but within the same corporate group. **Suggestions** have been made that this figure may be closer to 70 percent.

Estimates vary as to how much tax revenue is lost by governments due to transfer mispricing. Global Financial Integrity in Washington estimates the amount at several hundred billion dollars annually. A March 2009 **Christian Aid report** estimated $1.1 trillion in bilateral trade mispricing into the EU and the US alone from non-EU countries from 2005 to 2007.

Transfer mispricing: traditional approaches

The conventional international approach to dealing with transfer mispricing is through the "arm's length" principle: that a transfer price should be the same as if the two companies involved were indeed two unrelated parties negotiating in a normal market, and not part of the same corporate structure. The OECD and the United Nations Tax Committee have both endorsed the "arm's length" principle, and it is widely used as the basis for bilateral treaties between governments.

Many companies strive to use the arm's length principle faithfully. Many companies strive to move in exactly the opposite direction. In truth, however, the arm's length principle is very hard to implement, even with the best intentions.

The Arm's Length principle

If two unrelated companies trade with each other, a market price for the transaction will generally result. This is known as "arms-length" trading, because it is the product of genuine negotiation in a market. This arm's length price is usually considered to be acceptable for tax purposes.

But when two *related* companies trade with each other, they may wish to artificially distort the price at which the trade is recorded, to minimise the overall tax bill. This might, for example, help it record as much of its profit as possible in a tax haven with low or zero taxes.

How does World Inc. shift its profits into a tax haven?

For example, World Inc. grows a crop in Africa, then harvests and processes it and transports and sells the finished product in the United States. It has three subsidiaries: Africa Inc. (in Africa), Haven Inc. (in a zero-tax haven) and USA Inc. (in the U.S.).

Africa Inc. sells the produce to Haven Inc. at an artificially low price. So Africa Inc. has artificially low profits – and therefore an artificially low tax bill in Africa. Then Haven Inc. sells the product to USA Inc. at a very high price – almost as high as the final retail price at which USA Inc. sells the processed product. So USA Inc. also has artificially low profits, and an artificially low tax bill in the U.S. But Haven Inc. is different: it has bought cheaply and sold at a very high price, creating very high artificial profits. Yet it is located in a tax haven – so it pays no taxes on those profits. Voila! A tax bill disappears.

The example in the box illustrates how this is done. The "Arm's Length" principle is supposed to stop this by ensuring that the prices are recorded as if the trades were conducted at 'arm's length.' In practice, it is unworkable in many if not most situations: a lot of multinational corporate tax avoidance happens for this reason.

Consider what has happened in the example in the box with World Inc. These games have not resulted in more efficient or cost-effective production, transport, distribution or retail processes in the real world. The end result is, instead, that World Inc. has shifted its profits artificially out of both Africa and the United States, and into a tax haven. As a result, tax dollars have been shifted artificially away from both African and U.S. tax authorities, and have been converted into higher profits for the multinational.

This is a core issue of tax justice – and unlike many issues which are considered to be either "developing country" issues or "developed country" issues – in this case the citizens of both rich and poor nations alike share a common set of concerns. Even so, developing countries are the most vulnerable to transfer mispricing by multinational corporations.

Example, that two related parties are trading a tiny component for an aircraft engine, which is only made for that engine, and not made by anyone else. There are no market comparisons to be made, so the "arm's length" price is not obvious. Or consider the case of a company's brand. How much is the Shell Oil logo really worth? There is great scope for misunderstanding and for

deliberate mispricing – providing much leeway for abuse, especially with regard to intellectual property such as patents, trademarks, and other proprietary information.

The resulting damage from the prevalent "arm's length" approach has been, and is, substantial. Governments around the world are systematically hobbled in their ability to collect revenues from the corporate tax system. Billions of dollars are wasted annually around the world on governmental enforcement efforts that have little chance of success, and on meeting expensive compliance requirements.

Alternative approaches: unitary taxation with profit apportionment

While multinationals tend to favour the arm's length principle as the basis for determining transfer pricing – it gives them tremendous leeway to minimise tax – academics, some public sector and private sector practitioners and, increasingly, non-governmental organisations, favour an alternative approach: combined reporting, with formulary apportionment and Unitary Taxation. This would prioritise the economic *substance* of a multinational and its transactions, instead of prioritising the legal *form* in which a multinational organises itself and its transactions.

These terms may seem complex and baffling, but the basic principles are quite straightforward, and the system is far simpler than the ineffective "arm's length" method.

While the arm's length principle gives multinational companies leeway to decide for themselves where to shift their profits, the unitary taxation approach involves taxing the various parts of a multinational company based on what it is doing in the real world.

Unitary taxation originated in the United States over a century ago, as a response to the difficulties that U.S. states were having in taxing railroads. How would these multi-jurisdictional corporate entities be taxed by each state? Gross receipts within the state? Assets? How should they tax the railroad's rolling stock? In the state of incorporation, or in the states in which it was used?

The U.S. Supreme Court ruled that taxing rights between states should be apportioned "fairly." Now over 20 states inside the United States, notably California, have set up a system where they treat a corporate group as a unit, then the corporate group's income is "apportioned" out to the different states according to an agreed formula. Then each state can apply its own state income tax rate to whatever portion of the overall unit's income was apportioned to it. Such a formula allocates profits to a jurisdiction based upon real factors such as total third-party sales; total employment (either calculated by headcount or by salaries) and the value of physical assets actually located in

each territory where the multinational operates. States can still set whatever local tax rates they want. In what may be a sign of the system's usefulness, more states have been adopting it of late: Michigan and Massachusetts (2008), New York and West Virginia (2007), Texas (2006) and Vermont (2004.)

Imagine a company with a one-man booking office in the Cayman Islands, with no local sales. Under current "arm's length" rules, it can shift billions of dollars of profits into this office, and use this to cut its tax bill sharply. Under Unitary Taxation (formulary apportionment) however, the formula based on sales and payroll would allocate only a miniscule portion of the income under the formula to Cayman, so only a miniscule portion would be subected to Cayman's zero tax rate. The countries where real economic activity is happening – Africa and the United States, in the above example, would then be able to tax the income that is rightfully theirs to tax.

There are technical and political complexities involved in designing such an "apportionment" formula, but with political will they are quite surmountable. Limited forms of unitary taxation have been shown to work well in practice, as the experience of U.S. states shows.

The aim of unitary taxation, then, is to tax portions of a multinational company's income without reference to how that enterprise is organised internally. In addition, multinational enterprises with the same total income generally are treated the same under this method.

Multinational companies would have far less need to set themselves up as highly complex, tax-driven multi-jurisdictional structures, and would simplify their corporate structures, creating major efficiencies. Billions could be saved on tax enforcement. The big losers, apart from multinationals, would be accountancy and legal firms, and economic consultants, who derive substantial income from setting up and servicing complex tax-driven corporate structures.

Developing countries should have a particular interest in this approach.

There are three main obstacles to unitary taxation:

1. ***Path dependency***. The "arm's length" approach is how the international tax system has emerged, and there will be great institutional resistance to change established practices. Still, the alternative of unitary taxation is not an all-or-nothing approach requiring everyone to adopt it at once. It could be adopted by some states and not others, or hybrid versions between Unitary Taxation and the Arm's Length approach could be adopted as interim steps.

2. ***Vested interests***. Because multinational corporations like having the leeway to manipulate transfer pricing, they have a strong interest in maintaining the status quo.

3. ***Technical issues***. There are potentially important technical complexities in designing an appropriate formula, and more work needs to be done in this area.

Unitary taxation is compatible in theory with country-by-country reporting, a concept developed by TJN's senior adviser Richard Murphy. More precisely, Country by Country reporting could serve as the accounting basis for formulary apportionment and unitary taxation.

Current accounting standards require corporations to publish certain financial and other data, but they allow them to sweep up all the results from a range of different jurisdictions and put them into a single, aggregate figure, perhaps under a heading "International" or some such. It is not possible to unpick multinational corporations' financial statements, to determine what is happening in each country of operation.

Country-by-country reporting information by MNCs:

(1) The name of each country in which it operates.

(2) The names of all its subsidiaries and affiliates in each country in which it operates.

(3) The performance of each subsidiary and affiliate in every country in which it operates, without exception.

(4) The tax charge included in its accounts of each subsidiary and affiliate in each country in which it operates.

(5) Details of the cost and net book value of its fixed assets located in each country in which it operates.

(6) Details of its gross and net assets for each country in which it operates.

Country- by country reporting would also disclose if there was deliberate material mispricing of goods or services across international borders. Criteria could be adapted to fit a formula under unitary taxation.

Even without unitary taxation, Country by country reporting would be extremely valuable in order to try to determine whether arm's length principles are being complied with.

Transfer Pricing Policy

Determination of transfer pricing policy is an ex-ante approach which brings certainty to the inter-company transfer pricing and mitigates transfer pricing exposure in advance. Therefore, prior taking on any international transactions or specified domestic transactions with its associated

enterprise it is essential that the transaction is evaluated, structured and planned specifically considering the transfer pricing impact.

Our planning approach is fact specific and would cover the following:

- supply chain Re- engineering
- new transactions planning
- structuring cost sharing arrangements domestic and international inter-company transactions
- comparability/ economic analysis
- preparation of inter-company agreements from a transfer pricing perspective
- documentation
- process set up and integration

Conclusion: Transfer price represents the value of goods and services furnished by a profit centre to other responsibility centres within an organization. It becomes the transfer price when the value of such internal transfers is expressed in terms of money. The underlying principle is that the transfer price forms revenue for the selling division and an element of cost of the buying division. Since the transfer price has a bearing on the revenues, costs, and profits of the responsibility centres, the need for determination of TP becomes all the more important.

Total Quality Management (TQM)

TQM is a management approach that originated in the 1950s and has steadily become more popular since the early 1980s. Total quality is a description of the culture, attitude and organization of a company that strives to provide customers with products and services that satisfy their needs.

A core **definition** of **total quality management** (**TQM**) describes a management approach to long–term success through customer satisfaction. In a **TQM** effort, all members of an organization participate in improving processes, products, services, and the culture in which they work.

A holistic approach to long-term success that views continuous improvement in all aspects of an organization as a process and not as a short-term goal. It aims to radically transform the organization through progressive changes in the attitudes, practices, structures, and systems.

Total quality management transcends the product quality approach, involves everyone in the organization, and encompasses its every function: administration, communications, distribution, manufacturing, marketing, planning, training, etc. Coined by the US Naval Air Systems Command in early 1980s, this term has now taken on several meanings and includes

(1) commitment and direct involvement of highest-level executives in setting quality goals and policies, allocation of resources, and monitoring of results; (2) realization that transforming an organization means fundamental changes in basic beliefs and practices and that this transformation is everyone's job;

(3) building quality into products and practices right from the beginning;

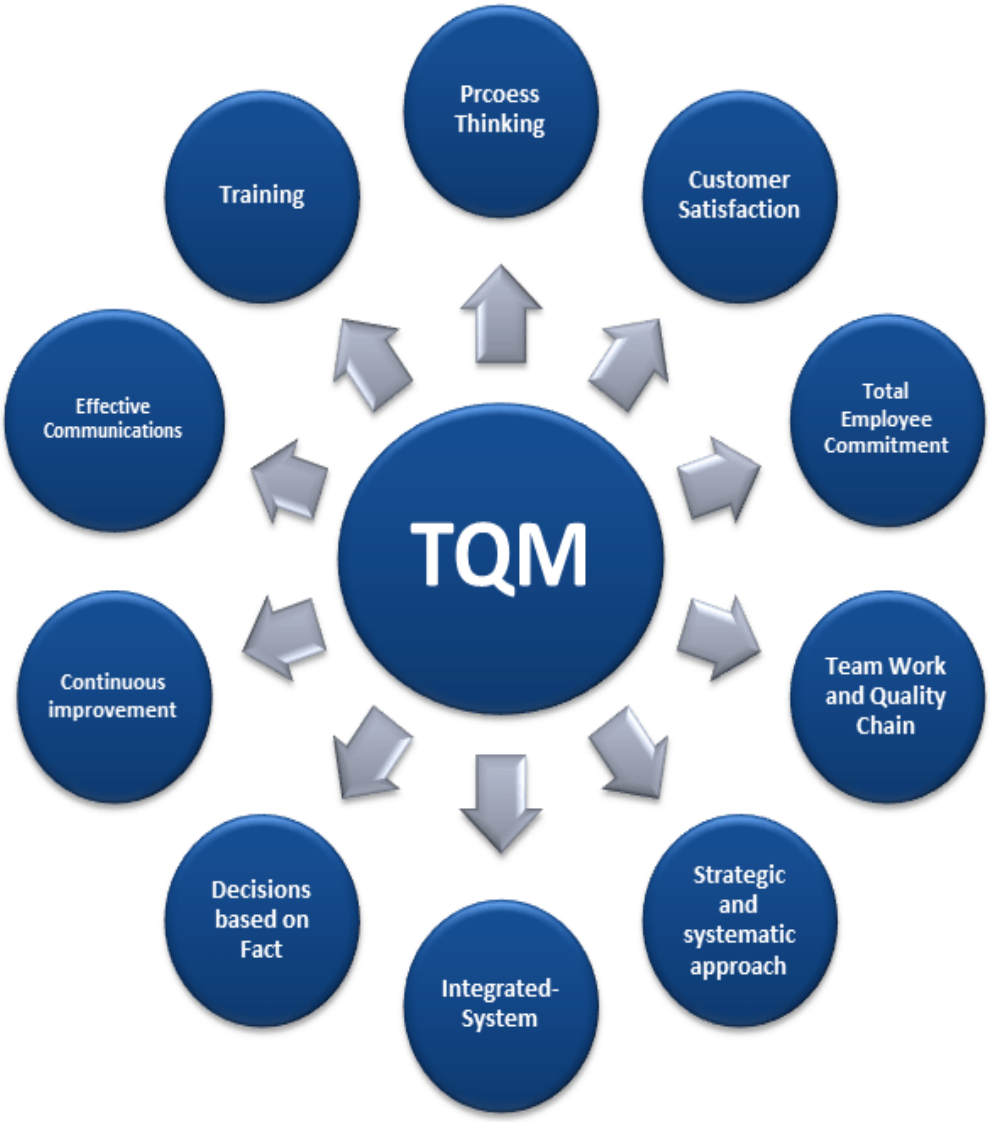
(4) understanding of the changing needs of the internal and external customers, and stakeholders, and satisfying them in a cost effective manner;

(5) instituting leadership in place of mere supervision so that every individual performs in the best possible manner to improve quality and productivity, thereby continually reducing total cost;

(6) eliminating barriers between people and departments so that they work as teams to achieve common objectives; and

(7) instituting flexible programs for training and education, and providing meaningful measures performance that guide the self-improvement efforts of everyone involved.

TQM encourages participation amongst shop floor workers and managers. There is no single theoretical formalization of total quality, but Deming, Juran and Ishikawa provide the core assumptions, as a "…discipline and philosophy of management which institutionalizes planned and continuous… improvement … and assumes that quality is the outcome of all activities that take place within an organization; that all functions and all employees have to participate in the improvement process; that organizations need both quality systems and a quality culture."



TQM is a management philosophy that seeks to integrate all organizational functions (marketing, finance, design, engineering, and production, customer service, etc.) to focus on meeting customer needs and organizational objectives.

TQM views an organization as a collection of processes. It maintains that organizations must strive to continuously improve these processes by incorporating the knowledge and experiences of workers. The simple objective of TQM is "Do the right things, right the first time, every time." TQM is infinitely variable and adaptable. Although originally applied to manufacturing operations, and for a number of years only used in that area, TQM is now becoming recognized as a generic

management tool, just as applicable in service and public sector organizations. There are a number of evolutionary strands, with different sectors creating their own versions from the common ancestor. TQM is the foundation for activities, which include:

- Commitment by senior management and all employees
- Meeting customer requirements
- Reducing development cycle times
- Just in time/demand flow manufacturing
- Improvement teams
- Reducing product and service costs
- Systems to facilitate improvement
- Line management ownership
- Employee involvement and empowerment
- Recognition and celebration
- Challenging quantified goals and benchmarking
- Focus on processes / improvement plans
- Specific incorporation in strategic planning

This shows that TQM must be practiced in all activities, by all personnel, in manufacturing, marketing, engineering, R&D, sales, purchasing, HR, etc.

Principles of TQM

The key principles of TQM are as following:

Management Commitment

- Plan (drive, direct)
- Do (deploy, support, participate)
- Check (review)
- Act (recognize, communicate, revise)

Employee Empowerment

- Training
- Suggestion scheme
- Measurement and recognition
- Excellence teams

Fact Based Decision Making

- SPC (statistical process control)
- DOE, FMEA
- The 7 statistical tools
- TOPS (Ford 8D – team-oriented problem solving)

Continuous Improvement

- Systematic measurement and focus on CONQ
- Excellence teams
- Cross-functional process management
- Attain, maintain, improve standards

Customer Focus

- Supplier partnership
- Service relationship with internal customers
- Never compromise quality
- Customer driven standards

The Primary Elements of TQM

Total quality management can be summarized as a management system for a customer-focused organization that involves all employees in continual improvement. It uses strategy, data, and effective communications to integrate the quality discipline into the culture and activities of the organization.

- **Customer-focused**. The customer ultimately determines the level of quality. No matter what an organization does to foster quality improvement—training employees, integrating quality into the design process, upgrading computers or software, or buying new measuring tools—the customer determines whether the efforts were worthwhile.

- **Total employee involvement**. All employees participate in working toward common goals. Total employee commitment can only be obtained after fear has been driven from the

workplace, when empowerment has occurred, and management has provided the proper environment. High-performance work systems integrate continuous improvement efforts with normal business operations. Self-managed work teams are one form of empowerment.

- **Process-centered**. A fundamental part of TQM is a focus on process thinking. A process is a series of steps that take inputs from suppliers (internal or external) and transforms them into outputs that are delivered to customers (again, either internal or external). The steps required to carry out the process are defined, and performance measures are continuously monitored in order to detect unexpected variation.

- **Integrated system**. Although an organization may consist of many different functional specialties often organized into vertically structured departments, it is the horizontal processes interconnecting these functions that are the focus of TQM.
  - Micro-processes add up to larger processes, and all processes aggregate into the business processes required for defining and implementing strategy. Everyone must understand the vision, mission, and guiding principles as well as the quality policies, objectives, and critical processes of the organization. Business performance must be monitored and communicated continuously.
  - An integrated business system may be modeled after the Baldrige National Quality Program criteria and/or incorporate the ISO 9000 standards. Every organization has a unique work culture, and it is virtually impossible to achieve excellence in its products and services unless a good quality culture has been fostered. Thus, an integrated system connects business improvement elements in an attempt to continually improve and exceed the expectations of customers, employees, and other stakeholders.
- **Strategic and systematic approach**. A critical part of the management of quality is the strategic and systematic approach to achieving an organization's vision, mission, and goals. This process, called strategic planning or strategic management, includes the formulation of a strategic plan that integrates quality as a core component.

- **Continual improvement**. A major thrust of TQM is continual process improvement. Continual improvement drives an organization to be both analytical and creative in finding ways to become more competitive and more effective at meeting stakeholder expectations.

- **Fact-based decision making**. In order to know how well an organization is performing, data on performance measures are necessary. TQM requires that an organization continually collect and analyze data in order to improve decision making accuracy, achieve consensus, and allow prediction based on past history.

- **Communications**. During times of organizational change, as well as part of day-to-day operation, effective communications plays a large part in maintaining morale and in motivating employees at all levels. Communications involve strategies, method, and timeliness.

These elements are considered so essential to TQM that many organizations define them, in some format, as a set of core values and principles on which the organization is to operate.

Five Principles of TQM

In order to exceed customer expectations, an organization must embrace five principles:

- Produce quality work the first time
- Focus on the customer
- Have a strategic approach to improvement
- Improve continuously
- Encourage mutual respect and teamwork

Producing quality work (the first time) means quality is built into the processes for producing products or providing services, and continual improvement measures are taken to ensure the processes work every time. Employees are empowered to make decisions to improve a process and are provided with continual training to develop their skills.

The purchasing department at Fun Time Travel evaluates data on client purchases to determine which packages are most popular with clients. This helps them to determine what stays and what

goes. The information technology technicians monitor the website continually to assess whether clients are just browsing or actually making purchases. The IT guys also evaluate how long a booking takes to determine whether changes need to be made to the check-out process.

Focusing on the customer involves designing products or services that meet or exceed the customer's expectations. This involves the product itself, its functionality, attributes, convenience and even the means by which the information about a product is received by a client.

The marketing department is responsible to get the cyber-word out to potential clients. Marketers use a wide variety of media sources, like social networking, email and even texting, to get the word out about Fun Time's website. If they notice traffic is not moving toward the website or that clients are not staying online long enough, they will make strong suggestions to the IT department and the research and development department to make changes immediately.

By **having a strategic approach to improvement**, processes are developed and tested to ensure the product or service's quality. This also involves making sure suppliers offer quality supplies needed to produce products.

The purchasing department monitors client reviews to determine whether the ratings on the website are similar to those of actual past customers. This makes it possible for purchasing to add more travel packages to the company's inventory.

Improving continuously means always analyzing the way work is being performed to determine if more effective or efficient ways are possible, making improvements and striving for excellence all the time.

The human resources department is interested in making sure employees are qualified to perform their jobs. By having qualified and trained employees on the team, the website will run effectively. Calls to the travel desk will be handled efficiently. Any interruption to the booking process will be quickly fixed, and improvements will be made.

Encouraging mutual respect and teamwork is important because it fosters a single-organizational culture of excellence by knowing that every employee from top to bottom of the hierarchy holds the same core principles at heart.

Six Sigma

Six Sigma is a disciplined, data-driven approach and methodology for eliminating defects (driving toward **six** standard deviations between the mean and the nearest specification limit) in any process – from manufacturing to transactional and from product to service.

A method that provides organizations tools to improve the capability of their business processes. This increase in performance and decrease in process variation lead to defect reduction and improvement in profits, employee morale, and quality of products or services. Six Sigma quality is a term generally used to indicate a process is well controlled (within process limits ±3s from the center line in a control chart, and requirements/tolerance limits ±6s from the center line).

The goal of any organization is to streamline its processes, thereby maximizing resources to their fullest extent. One of the most visible results of streamlining processes is the reduction of defects in their products. The reduction of defects means less waste and, therefore, the resources are fully utilized.

The Six Sigma concept was originally conceived in a manufacturing context in which the defects were literally found in products being churned out of industries. The manufacturing unit applied a scale based on the number of defects found where the sixth sigma had a fraction of one percent defects, and the first sigma referred to a unit with almost thirty percent defects. The term became popular because of Motorola, who set a goal to achieve Six Sigma in all their manufacturing units.

It is easy to quantify defects in physical products of the manufacturing industry. However, it was a little more difficult to apply the same quality management tool in the service sector. Therefore, the process became the product, and any process that generated an outcome that was against the customer's wishes became a defect.

Methodologies

There are two methodologies commonly used for Six Sigma projects: the DMAIC methodology, implemented on existing business processes, and DMADV, used to formulate new business processes using Six Sigma tenets during the design stage.

DMAIC is an acronym standing for the five phases used in the streamlining process:

1. **Define** the customer's wishes, the goals of the project, and what the end product should be
2. **Measure** all the current parameters of the process in question, carefully collecting data to analyze
3. **Analyze** the data
4. **Improve** the process based on the analysis performed
5. **Control** the process to minimize variations

DMADV is also an acronym and, similar to DMAIC, has five phases used for designing processes according to Six Sigma:

1. **Define** the goals that the process should have based upon customer requirements
2. **Measure** all parameters that are associated with the process
3. **Analyze** the parameters and the data collected during measurement, and create a design that suits the goals best
4. **Design** the process
5. **Verify** that the process runs according to set goals

Implementation Roles

Earlier on all quality improvement programmes were implemented away from the actual process. The employees were not an integral part of the quality process, as this function was looked after by an entirely different department. This system was not working optimally because the employees

who had hands-on experience with the work could not implement the quality controls imposed upon them. On the other hand, the quality control supervisors were unable to understand the core working process properly and, therefore, could not define proper quality controls.

Six Sigma changed that paradigm entirely, borrowing heavily from martial arts disciplines. In the new structure, the organization has multiple levels, each trained in stages of Six Sigma methodology. The improvements come from the employees who actually work with the processes.

There are six major roles defined for implementation: Executive Leadership, Champions, Master Black Belts, Black Belts, Green Belts, and Yellow Belts. The roles are designed to divide the tasks of implementing Six Sigma successfully throughout the organization.

Balanced Scorecard

Introduction

As companies around the world transform themselves for competition that is based on information, their ability to exploit intangible assets has become far more decisive than their ability to invest in and management of physical assets. Several years ago in recognition of this change the concept of balanced scorecard was introduced. This scorecard provides a framework in which both financial and nonfinancial success measures are linked by the firm's strategy. It served as a complement for financial measures and helped companies to discover its value as the cornerstone of a new strategic management system. This dynamic method offers guidelines and tools that show the practitioners how to measure key value indicators, link the scorecard to overall organizational strategy and effectively communicate learning results to management.

The Balanced Scorecard is a strategic planning and management system used to align business activities to the vision and strategy of the organization by monitoring performance against strategic goals.

DEFINITION

A Balanced Scorecard is a management tool that provides senior executives with a comprehensive set of measures to assess how the organization is progressing toward meeting its strategic goals.

Evolution of the BSC:

The balanced scorecard gained popularity in the past fifteen years through the innovative and progressive work of Dr. Robert Kaplan and Dr. David Norton. Through this research they were determined

to help organizations to effectively translate their strategic plans and objectives into tactical and tangible results. This is the focus also on the human issues that drive outcomes, so that the organizations focus on the future and act in their long-term best interests. Today the term “balanced scorecard” is now an integral part of modern business lexicon and an essential educational component.

Traditional Management Processes Versus the Balanced Scorecard

Traditional Management Processes	Balanced Scorecard
• Measures governed by the financial reporting system • Anchored to an accounting model based on tangible assets • Performance witnessed through balance sheets • Financial measures reflect past performance	• Complements financial measures of past performance with measures of the drivers of future performance • Objectives and measures are derived from vision and strategy • Leading and lagging performance measures • Financial and non-financial measures • Tangible and intangible assets and resources • Past and future performance • Short and long-term objectives

Wheals of the Balanced Scorecard:

- BSC helps the companies to clarify and update strategy..
- BSC can be used to communicate strategy throughout the organization.
- BSC helps companies to align unit and individual goals with the strategy.
- BSC links strategic objectives to long-term targets and annual budgets.
- BSC helps in conducting periodic performance in corporates.
- BSC provides reviews to learn about and improve strategy.
- BSC helps in tying financial compensation to performance (incentive compensation).

BSC helps in granularizing high-level objectives into tangible and relevant components which is vital in achieving corporate-level results

Processes involved in Balanced Scorecard:

The scorecard introduces four new management processes that, separately and in combination, contribute to linking long-term strategic objectives with short-term actions.

1. Translation the vision: Helps the managers build a consensus around the organization's vision and strategy.

2. Communication and linking: Lets the managers communicate their strategy up and down the organization and link rewards to performance measures.

3. Business planning and target setting: Enables the companies to integrate their business and financial plans, allocate their resources accordingly and establish milestones.

4. Strategic feedback and learning: Helps companies in articulating a shared vision thus facilitating strategy review and learning.

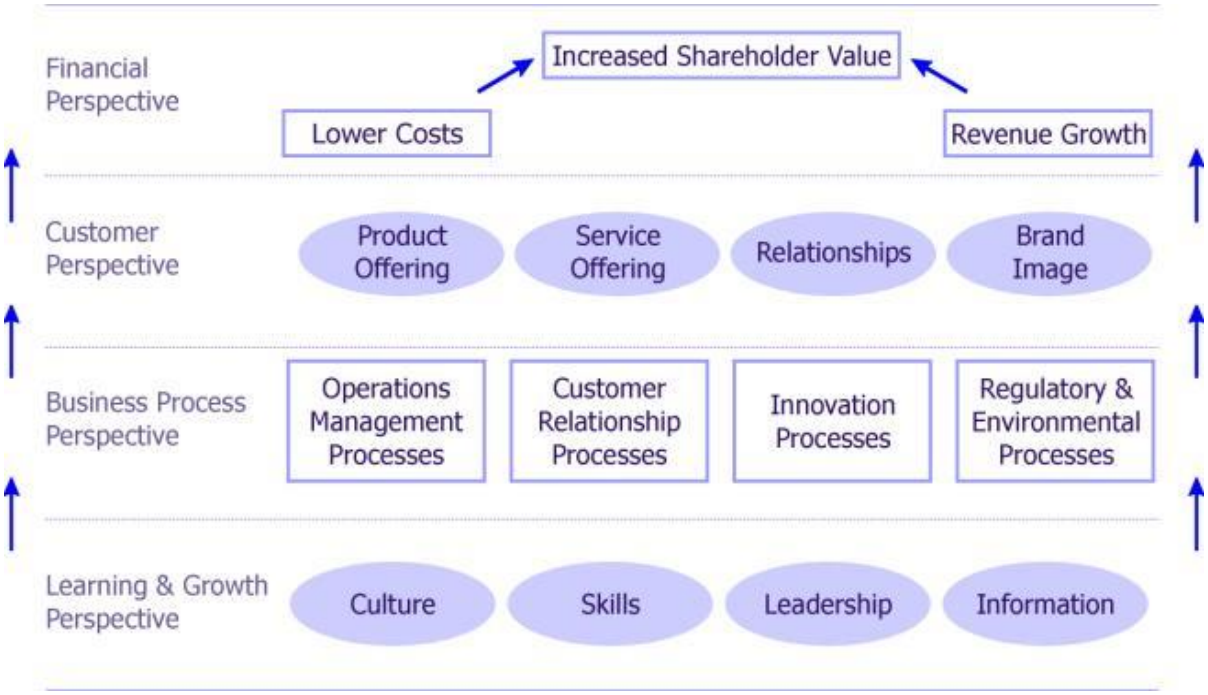
4 Business Perspectives of BSC

- Financial
- Internal Business Process
- Learning and Growth
- Customer

Balanced Scorecard Measurements

Perspective	Generic Measurements
Financial	Return of Capital Employed, Economic value added, Sales growth, Cash flow
Customer	Customer satisfaction, retention, acquisition, profitability, market share
Internal business process	Includes measurements along the internal value chain for: Innovation - measures of how well the company identifies the customers' future needs. Operations - measures of quality, cycle time, and costs. Post sales service - measures for warranty, repair and treatment of defects and returns.
Learning and growth	Includes measurements for: People - employee retention, training, skills, morale. Systems - measure of availability of critical real time information needed for front line employees.

Balanced Scorecard Strategy Map



Advantages of Balanced Scorecard

- It is useful in facilitating organisations to achieve a strategic focus
- It has the potential to bridge the gap between vague mission statements and day-to-day operations.
- Helps organisations in performance improvements
- It is a useful tool of waste management
- It helps to strengthen the stakeholders relationships to shareholders value creation
- It helps in determining the cause and effect relationships
- Wedding of Human Resource Accounting to BSC will evolve a fool proof method of assessing HR value.
- BSC can be applied well in cultures around the world.
- Revolution in information technology has facilitated the collection, access and interpretation of a vast amount and range of information
- Scorecard enhances the effectiveness of the TQM programmes.
- The non-financial measures of the balanced scorecard produces successful outcomes from reengineering efforts.
- Activity Based Costing(ABC) identifies cost drivers and BSC identifies the value drivers. BSC is thus used to complement ABC.
- BSC encourages analysts and shareholders to focus on critical nonfinancial variables that are outcomes of a successful strategy.

Disadvantages of Balance Scorecard

Lack of a well Defined Strategy

- The balanced scorecard relies on a well defined strategy and understanding of linkages between strategic objections and metrics. Without this foundation the implementation could fail.

Too much focus on the lagging measures

- Focusing on only the lagging measures may cause a lack of priority or opportunity for the leading measures.

Use of Generic Metrics

- Don’t just copy metrics from another firm. Identify the measures that apply to your strategy and competitive position .

Self-serving managers

- Managers whose goal is to achieve a desired result in order to obtain a bonus or other self reward

Conclusion:

Without Balanced Scorecard, most organizations are unable to achieve a similar consistency of vision and action as they attempt to change direction and introduce new strategies and processes. The balanced scorecard provides a framework for managing the implementation of strategy itself to evolve in response to changes in the company's competitive market and technological environments. This helps the academics and practitioners to develop a more comprehensive and integrated set of criteria for judging and guiding corporate and segmental performance.

Self assessment Questions

1. What is transfer pricing? Why it is essential?
2. What is Arms' Length Price?
3. Explain the *Key features of the TP Regulations*
4. What is **unitary taxation with profit apportionment? Explain the main obstacles to unitary taxation**
5. What is Balanced Scorecard? State its unique features.
6. Explain the process of BSC as a performance appraisal technique.
7. Discuss the merits and demerits of BSC.
8. Distinguish between **Traditional Management Processes Versus the Balanced Scorecard.**