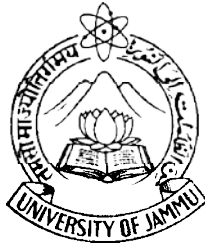


***Directorate of Distance Education***

**UNIVERSITY OF JAMMU**

**JAMMU**



**SELF LEARNING MATERIAL**

**B.COM.**

**SEMESTER-VI**  
**COURSE NO. : BCG - 601**

**UNIT I-IV**  
**LESSON NO. 1-12**

**ROHINI GUPTA SURI**  
**COURSE CO-ORDINATOR**

<http://www.distanceeducationju.in>

Printed and Published on behalf of the Directorate of Distance Education,  
University of Jammu, Jammu by the Director, DDE, University of Jammu, Jammu

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**B.COM**

**BCG - 601**

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• Printed by : Rohini / 18 / 450

**UNIVERSITY OF JAMMU B. COM. SIXTH SEMESTER**  
**MANAGEMENT ACCOUNTING**

C.No. BCG-601  
Time : 3 Hrs.

Max. Marks =100  
Internal Assessment=20  
External Exam= 80

**OBJECTIVE** : To acquaint the students with the knowledge of cost accounting and management accounting methods and technique to take optimal managerial decisions.

**UNIT - I : MANAGEMENT ACCOUNTING AND WORKING CAPITAL MANAGEMENT**

Meaning and importance of management accounting and its limitation, distinguish between management accounting, cost accounting & financial accounting. Meaning and uses of working capital; Factors determining working capital requirement; Computation of working capital requirement of a concern.

**UNIT - II : COST VOLUME PROFIT ANALYSIS**

Meaning of marginal cost and marginal costing; Marginal costing Vs absorption costing; Assumptions of marginal costing; Advantages and limitations of marginal costing; Profit Volume Ratio-Meaning and importance; Breakeven point-Meaning and its uses; Managerial applications of marginal costing- Pricing decision, profit planning, make or buy decision, selection of profitable sales mix; Numerical problems on Cost-Volume-Profit analysis.

**UNIT - III : ACCOUNTING FOR VARIANCE**

Meaning of standard costing; Difference between standard costing and estimated cost; Merits and demerits of standard costing; Calculation of material variances- Cost, price, usage, mix and yield variances; Calculation of labour variances-cost, rate, efficiency, mix and idle time variance.

**UNIT - IV : CASH FLOW ANALYSIS**

Meaning of cash flow statement; classification of cash flow; Comparison between fund flow and cash flow; Uses and significance of cash flow statement; limitation of cash flow statement. Meaning of budget and its features.

Preparation of cash flow statement using AS-3 (Revised) Preparation of cash budget.

**SKILL DEVELOPMENT (GUIDELINES FOR CLASS ROOM TEACHING AND INTERNAL ASSESSMENT)**

- \* Draw a break-even chart with imaginary figures.
- \* Help the students in understanding the various concepts by solving numerical problems.
- \* Create deep understanding of all concepts specified in the syllabus.

**BOOK RECOMMENDED**

1. Sharma, R.K. Gupta : Management Accounting, Kalyani Publishing House, New Delhi
2. Arora, M.N. : Management Accounting, Himalaya Publishing House, New Delhi.
3. Saxena, V.K & Vashisht, : Advance Cost and Management Accounting C.D. Test, Sultan Chand Pub., New Delhi
4. Garrison, Ray H. & Noreen, Eric W : Managerial Accounting, Tata McGraw, New Delhi
5. Khan, M.Y. & Jain, P.K : Management Accounting, Tata McGraw, New Delhi
6. Lal, Jawahar : Accounting for Manager, Tata McGraw, New Delhi
7. Maheshwari, S.N. : Management Accounting, Shri Mahabir Depot, New Delhi
8. Panday, I.M. : Management Accounting, Vikas Publishing House, New Delhi
9. Rathan, P.V. Lalitha : Management Accounting & Financial Analysis, Kitab Mahal Publishers
10. Horgeen Charles T. Sundem Gary L. : Introduction of Management Accounting Prentice Hall of India, New Delhi.

11. Bhattacharya : Management Accounting, Pearson Pub, New Delhi
12. Singhavi & Bodhan : Management Accounting-Text and Cases, PHI

**NOTE FOR PAPER SETTER**

Equal weightage shall be given to all the units of the syllabus. The external paper shall be of the two sections viz, A & B.

**Section A** : This section will contain four short answer questions selecting one from each unit. Each question carries 5 marks. A candidate is required to attempt all the four questions. Total weightage of this section shall be 20 marks.

**Section-B** This section will contain eight long questions of 15 marks each. Two questions with internal choice will be set from each unit. A candidate has to attempt any four questions selecting one from each unit. Total weightage to this section shall be 60 marks.

## **MANAGEMENT ACCOUNTING AND WORKING CAPITAL**

### **STRUCTURE**

- 1.1 Introduction
- 1.2 Objective
- 1.3 Definitions of Management Accounting
- 1.4 Nature of Management Accounting
- 1.5 Functions of Management Accounting
- 1.6 Scope of Management Accounting
- 1.7 Limitations of Management Accounting
- 1.8 Management Accounting and Financial Accounting
- 1.9 Cost Accounting and Management Accounting
- 1.10 Meaning and uses of working capital
- 1.11 Concept of working capital
- 1.12 Components of working capital
- 1.13 Types of working capital
- 1.14 Factors determining working capital requirements
- 1.15 Computation (or estimation) of working capital
- 1.16 Summary
- 1.17 Glossary

1.18 Self-Test Questions

1.19 Suggested Readings

## **1.1 INTRODUCTION**

Management accounting can be viewed as Management-oriented Accounting. Basically it is the study of managerial aspect of financial accounting, “accounting in relation to management function”. It shows how the accounting function can be re-oriented so as to fit it within the framework of management activity. The primary task of management accounting is, therefore, to redesign the entire accounting system so that it may serve the operational needs of the firm. It furnishes definite accounting information, past, present or future, which may be used as a basis for management action. The financial data are so devised and systematically developed that they become a unique tool for management decision.

## **1.2 OBJECTIVE**

After reading this chapter, you will be able:

1. To understand the meaning, nature, scope and limitations of accounting.
2. To know the activities covered under management accounting and its difference with financial accounting.
3. To understand the meaning of Working Capital and factors determining Working Capital

## **1.3 DEFINITIONS OF MANAGEMENT ACCOUNTING**

The term “Management Accounting”, observe, Broad and Carmichael, covers all those services by which the accounting department can assist the top management and other departments in the formation of policy, control of execution and appreciation of effectiveness. This definition points out that management is entrusted with the primary task of planning, execution and control of the operating activities of an enterprise. It constantly needs accounting information on which to base its decision. A decision based on data is usually correct and the risk of erring is minimized. The position of the management in respect of its functions can be

compared to that of an army general who wants to wage a successful battle. A general can hardly fight successfully unless he gets full information about the surrounding situation and the extent of effectiveness of each of his battalions and, to the extent possible, even the enemy's intentions. Like a general a successful management too strives to outstrip other competitors in the field by streamlining its operating efficiency. It needs a thorough knowledge of the situation and the circumstances in which the firm operates. Such knowledge can only be gained through the processed financial data rendered by the accounting department on the basis of which it can take policy decision regarding execution, control, etc. It is here that the role of management accounting comes in. It supplies all sorts of accounting information in the form of such statements as may be needed by the management. Therefore, management accounting is concerned with the accumulation, classification and interpretation of information that assists individual executives to fulfill organizational objectives.

The Report of the Anglo-American Council of Productivity (1950) has also given a definition of management accounting, which has been widely accepted. According to it, "Management accounting is the presentation of accounting information in such a way as to assist the management in creation of policy and the day to day operation of an undertaking". The reasoning added to this statement was, "the technique of accounting is of extreme importance because it works in the most nearly universal medium available for the expression of facts, so that facts of great diversity can be represented in the same picture. It is not the production of these pictures that is a function of management but the use of them." An analysis of the above definition shows that management needs information for better decision-making and effectiveness. The collection and presentation of such information come within the area of management accounting. Thus, accounting information should be recorded and presented in the form of reports at such frequent intervals, as the management may want. These reports present a systematic review of past events as well as an analytical survey of current economic trends. Such reports are mainly suggestive in approach and the data contained in them are quite up to date. The accounting data so supplied thus provide the informational basis of action. The quality of information so supplied depends upon its usefulness



to management in decision-making. The usual approach is that, first of all, a thorough analysis of the whole managerial process is made, then the information required for each area is explored, and finally all the information after analysis in terms of alternatives, is taken into consideration before arriving at a managerial decision. It is to be understood here that the accounting information has no end in itself; it is a means to an end. As its basic idea is to serve the management, its form and frequency are all decided by managerial needs. Therefore, accounting aids the management by providing quantitative information on the economic well being of the enterprise. It would be appropriate if we called management accounting an Enterprise Economics. Its scope extends to the use of certain modern sophisticated managerial techniques in analyzing and interpreting operative data and to the establishment of a communication network for financial reporting at all managerial levels of an organization.

#### **1.4 NATURE OF MANAGEMENT ACCOUNTING**

The term management accounting is composed of ‘management’ and ‘accounting’. The word ‘management’ here does not signify only the top management but the entire personnel charged with the authority and responsibility of operating an enterprise. The task of management accounting involves furnishing accounting information to the management, which may base its decisions on it. It is through management accounting that the management gets the tools for an analysis of its administrative action and can lay suitable stress on the possible alternatives in terms of costs, prices and profits, etc. but it should be understood that the accounting information supplied to management is not the sole basis for managerial decisions. Along with the accounting information, management takes into consideration or weighs other factors concerning actual execution. For reaching a final decision, management has to apply its common sense, foresight, knowledge and experience of operating an enterprise, in addition to the information that it already has. The word ‘accounting’ used in this phrase should not lead us to believe that it is restricted to a mere record of business transactions i.e., book keeping only. It has indeed a ‘macro-economic approach’. As it draws its raw material from several other disciplines like costing, statistics, mathematics, financial accounting, etc., it can be called an interdisciplinary subject, the scope of which is not clearly demarcated. Other fields of study, which can be covered by management accounting, are political science, sociology, psychology, management, economics, statistics,

law, etc. A knowledge of political science helps to understand authority relationship and responsibility identification in an organization. A study of sociology helps to understand the behaviour of man in groups. Psychology enables us to know the mental make-up of employers and employees. A knowledge of these subjects helps to increase motivation, and to control the actions of the people who are ultimately responsible for costs. This builds a better employer-employee relationship and a sound morale. The subject of management reveals the processes involved in the art of managing, a knowledge of economics assists in the determination of optimum output in the forecasting of sales and production, etc., and also makes it possible to analyze management action in terms of cost revenues, profits, growth, etc. It is with the help of statistics that this information is presented to the management in a form that can be assimilated. The subject of management accounting also encompasses the subject of law, knowledge of which is necessary to find out if the management action is ultra vires or not. It is, therefore, a wide and diverse subject.

Management accounting has no set principles such as the double entry system of bookkeeping. In place of generally accepted accounting principles, the philosophy of cost benefit analysis is the core guide of this discipline. It says that no accounting system is good or bad but it can be considered desirable so long as it brings incremental benefits in excess of its incremental costs. Applying management accounting principles to financial matters can arrive at no single perfect solution. It is, therefore, an inexact science, which uses its own conventions rather than standardized principles. The facts to be studied here can be interpreted in different ways and the precision of the inferences depends upon the skill, judgement and common sense of different management accountants. It occupies a middle position between a fully matured and an infant subject. Since management accounting is managerially oriented, its data is selective in nature. It focuses on potential opportunities rather than opportunities lost. The data is operative in nature catering to the operational needs of a firm. It details events, monetary and non-monetary. The nature of data, the form of presentation and its duration are mainly determined by managerial needs. It is quite frequently reported as it is meant for internal uses and managerial control. An accountant should look at his enterprise from the management's point of view. Whenever he fails to do that he ceases to be a management accountant.

Management accounting is highly sensitive to management needs. However, it assists the management and does not replace it. It represents a service phase of management rather than a service to management from management accountant. It is rather highly personalized service. Finally, it can be said that the management accounting serves as a management information system and so enables the management to manage better.

### **1.5 FUNCTIONS OF MANAGEMENT ACCOUNTING**

The basic function of management accounting is to assist the management in performing its functions effectively. The functions of the management are planning, organizing, directing and controlling. Management accounting helps in the performance of each of these functions in the following ways:

- (i) **Provides data:** Management accounting serves as a vital source of data for management planning. The accounts and documents are a repository of a vast quantity of data about the past progress of the enterprise, which are must for making forecasts for the future.
- (ii) **Modifies data:** The accounting data required for managerial decisions is properly compiled and classified. For example, purchase figures for different months may be classified to know total purchases made during each period product-wise, supplier-wise and territory-wise.
- (iii) **Analyses and interprets data:** The accounting data is analyzed meaningfully for effective planning and decision-making. For this purpose the data is presented in a comparative form. Ratios are calculated and likely trends are projected.
- (iv) **Serves as a means of communicating:** Management accounting provides a means of communicating management plans upward, downward and outward through the organization. Initially, it means identifying the feasibility and consistency of the various segments of the plan. At later stages it keeps all parties informed about the plans that have been agreed upon and their roles in these plans.
- (v) **Facilitates control:** Management accounting helps in translating given objectives and strategy into specified goals for attainment by

a specified time and secures effective accomplishment of these goals in an efficient manner. All this is made possible through budgetary control and standard costing which is an integral part of management accounting.

- (vi) **Uses also qualitative information:** Management accounting does not restrict itself to financial data for helping the management in decision making but also uses such information which may not be capable of being measured in monetary terms. Such information may be collected from special surveys, statistical compilations, engineering records, etc.
- (vii) **Forecasting and Planning :** One of the important functions of management accounting is to provide necessary information and data for making short-term and long-term forecasts and planning the operations of the business. For doing this, the management accountant uses techniques of statistics, like probability, trend, study of correlation and regression; budgeting and standard costing, capital budgeting, marginal costing and cash funds flow statements etc. These are important tools in the hands of management accountant for the planning of the business.

## 1.6 SCOPE/ IMPORTANCE OF MANAGEMENT ACCOUNTING

### Scope of Management Accounting



Management accounting is concerned with presentation of accounting information in the most useful way for the management. Its scope is, therefore, quite vast and includes within its fold almost all aspects of business operations. However, the following areas can rightly be identified as falling within the ambit of management accounting:

- 1 Financial Accounting :** Management accounting is mainly concerned with the rearrangement of the information provided by financial accounting. Hence, management cannot obtain full control and coordination of operations without a properly designed financial accounting system.
- 2 Cost Accounting :** Standard costing, marginal costing, opportunity cost analysis, differential costing and other cost techniques play a useful role in operation and control of the business undertaking.
- 3 Revaluation Accounting :** This is concerned with ensuring that capital is maintained intact in real terms and profit is calculated with this fact in mind.
- 4 Budgetary Control:** This includes framing of budgets, comparison of actual performance with the budgeted performance, computation of variances, finding of their causes, etc.
- 5 Inventory Control:** It includes control over inventory from the time it is acquired till its final disposal.
- 6 Statistical Methods:** Graphs, charts, pictorial presentation, index numbers and other statistical methods make the information more impressive and intelligible.
- 7 Interim Reporting:** This includes preparation of monthly, quarterly, half-yearly income statements and the related reports, cash flow and funds flow statements, scrap reports, etc.
- 8 Taxation:** This includes computation of income in accordance with the tax laws, filing of returns and making tax payments.

- 9 **Office Services:** This includes maintenance of proper data processing and other office management services, reporting on best use of mechanical and electronic devices.
- 10 **Internal Audit:** Development of a suitable internal audit system for internal control.

### 1.7 LIMITATIONS OF MANAGEMENT ACCOUNTING

Management accounting, being comparatively a new discipline, suffers from certain limitations, which limit its effectiveness. These limitations are as follows:

1. **Limitations of basic records:** Management accounting derives its information from financial accounting, cost accounting and other records. The strength and weakness of the management accounting, therefore, depends upon the strength and weakness of these basic records. In other words, their limitations are also the limitations of management accounting.
2. **Persistent efforts.** The conclusions drawn by the management accountant are not executed automatically. He has to convince people at all levels. In other words, he must be an efficient salesman in selling his ideas.
3. **Management accounting is only a tool:** Management accounting cannot replace the management. Management accountant is only an adviser to the management. The decision regarding implementing his advice is to be taken by the management. There is always a temptation to take an easy course of arriving at decision by intuition rather than going by the advice of the management accountant.
4. **Wide scope:** Management accounting has a very wide scope incorporating many disciplines. It considers both monetary as well as non-monetary factors. This all brings inexactness and subjectivity in the conclusions obtained through it.
5. **Top-heavy structure:** The installation of management accounting system requires heavy costs on account of an elaborate organization and numerous rules and regulations. It can, therefore, be adopted only by big concerns.

6. **Opposition to change:** Management accounting demands a break away from traditional accounting practices. It calls for a rearrangement of the personnel and their activities, which is generally not like by the people involved.
7. **Evolutionary stage:** Management accounting is still in its initial stage. It has, therefore, the same impediments as a new discipline will have, e.g., fluidity of concepts, raw techniques and imperfect analytical tools. This all creates doubt about the very utility of management accounting.

## 1.8 MANAGEMENT ACCOUNTING AND FINANCIAL ACCOUNTING

Financial accounting and management accounting are closely interrelated since management accounting is to a large extent rearrangement of the data provided by financial accounting. Moreover, all accounting is financial in the sense that all accounting systems are in monetary terms and management is responsible for the contents of the financial accounting statements. In spite of such a close relationship between the two, there are certain fundamental differences. These differences can be laid down as follows:

- (i) **Objectives:** Financial accounting is designed to supply information in the form of profit and loss account and balance sheet to external parties like shareholders, creditors, banks, investors and Government.

Information is supplied periodically and is usually of such type in which management is not much interested. Management Accounting is designed principally for providing accounting information for internal use of the management. Thus, financial accounting is primarily an external reporting process while management accounting is primarily an internal reporting process.

- (ii) **Analyzing performance:** Financial accounting portrays the position of business as a whole. The financial statements like income statement and balance sheet report on overall performance or status of the business. On the other hand, management accounting directs its attention to the various divisions, departments of the business and reports about the

profitability, performance, etc., of each of them. Financial accounting deals with the aggregates and, therefore, cannot reveal what part of the management action is going wrong and why. Management accounting provides detailed analytical data for these purposes.

- (iii) **Data used:** Financial accounting is concerned with the monetary record of past events. It is a post-mortem analysis of past activity and, therefore, out the date for management action. Management accounting is accounting for future and, therefore, it supplies data both for present and future duly analyzed in detail in the 'management language' so that it becomes a base for management action.
- (iv) **Monetary measurement:** In financial accounting only such economic events find place, which can be described in money. However, the management is equally interested in non-monetary economic events, viz., technical innovations, personnel in the organization, changes in the value of money, etc. These events affect management's decision and, therefore, management accounting cannot afford to ignore them.

For example, change in the value of money may not find a place in financial accounting on account of "going concern concept". But while affecting an insurance policy on an asset or providing for replacement of an asset, the management will have to take into account this factor.

- (v) **Periodicity of reporting:** The period of reporting is much longer in financial accounting as compared to management accounting. The Income Statement and the Balance Sheet are usually prepared yearly or in some cases half-yearly. Management requires information at frequent intervals and, therefore, financial accounting fails to cater to the needs of the management. In management accounting there is more emphasis on furnishing information quickly and at comparatively short intervals as per the requirements of the management.
- (vi) **Precision:** There is less emphasis on precision in case of management accounting as compared to financial accounting since the information is



meant for internal consumption.

**(vii) Nature:** Financial accounting is more objective while management accounting is more subjective. This is because management accounting is fundamentally based on judgement rather than on measurement.

**(viii) Legal compulsion:** Financial accounting has more or less become compulsory for every business on account of the legal provisions of one or the other Act. However, a business is free to install or not to install system of management accounting.

The above points of difference between Financial Accounting and Management Accounting prove that Management Accounting has flexible approach as compared to rigid approach in the case of Financial Accounting. In brief, financial accounting simply shows how the business has moved in the past while management accounting shows how the business has to move in the future.

An attempt may now be made to compare and study the two types of accounting on basis of the characteristics of the data used. It is presented through the box-1.1, given below.

**Box 1.1**

<b>Features of data</b>	<b>Provided by Financial Accounting</b>	<b>Provided by Management accounting</b>
1. Period	After a stated period	At frequent intervals
2. Time	Historical data	Current and future data
3. Unit of expression	Money only	Any statistical unit
4. Nature	Actual data	Projected data
5. Specificity	Aggregates	Detailed analysis
6. Description	Money consequences	Events

7. Reality	Objective	Subjective
8. Precision	Pie to Pie accuracy	May be guess-work
9. Principles	Double entry system	Cost benefit analysis
10. Legality	Obligatory	Optional
11. Purpose	Overview of entire Business activity	Analytical details of such activities as call for decisions

### **1.9 COST ACCOUNTING AND MANAGEMENT ACCOUNTING**

Cost accounting is the process of accounting for costs. It embraces the accounting procedures relating to recording of all income and expenditure and the preparation of periodical statements and reports with the object of ascertaining and controlling costs. It is, thus, the formal mechanism by means of which the costs of products or services are ascertained and controlled. On the other hand, management accounting involves collecting, analyzing, interpreting and presenting all accounting information, which is useful to the management. It is closely associated with management control, which comprises planning, executing, measuring and evaluating the performance of an organization. Thus, management accounting draws heavily on cost data and other information derived from cost accounting.

Today cost accounting is generally indistinguishable from the so-called management accounting or internal accounting because it serves multiple purposes. However, management accounting can be distinguished from cost accounting in one important respect. Management accounting has a wider scope as compared to cost accounting. Cost accounting deals primarily with cost data while management accounting involves the considerations of both cost and revenue. Management accounting is an all inclusive accounting information system, which covers financial accounting, cost accounting, and all aspects of financial management. But it is not a substitute for other accounting functions. It involves a continuous process of reporting cost, financial and other relevant data in an analytical and informative way to management. We should not be very much concerned with boundaries of cost accounting and management accounting since they are complementary in

nature. In the absence of a suitable system of cost accounting, management accountant will not be in a position to have detailed cost information and his function is bound to lose significance. On the other hand, the management accountant cannot effectively use the cost data unless it has been reported to him in a meaningful and informative form.

<b>Bases of difference</b>	<b>Cost accounting</b>	<b>Management accounting</b>
1. meaning	The accounting that is concerned with the recording of cost, ascertainment of cost of product and service and analysis of cost is called cost accounting.	The accounting that is concerned with assisting the management in panning, decision making and controlling is called management accounting.
2. objectives	The main objective of cost accounting is the ascertainment, analysis and control of cost.	The main objective of management accounting is to provide necessary information to the management for planning, decision making and controlling.
3. nature	Under cost accounting the recording of historical transactions are made on the basis of which the future costs are estimated. So, it is historical as well as futuristic in nature.	Since, management accounting is concerned with panning and forecasting, it is futuristic in nature.
4. data	Cost accounting considers the quantitative figure only.	Besides the quantitative figures, management accounting considers the qualities aspects as well.

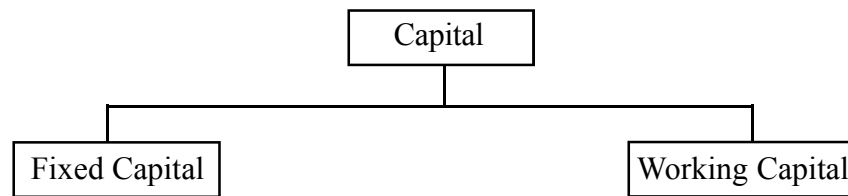
5. scope	Its scope is comparatively narrow since it does not include financial accounting tax planning and tax accounting.	Its scope is comparatively wide since it includes financial and cost accounting along with tax planning and tax accounting.
6. evolution	Cost accounting has evolved to overcome the limitations of cost accounting.	Management accounting has evolved to use the positive aspects of cost and financial accounting for planning and controlling.
7. installation	Cost accounting can be installed without management accounting.	Management accounting needs cost accounting and financial accounting for its installation.
8. status	The status of cost accounts come after management accountant.	The status of management accounts comes before the cost accountant.

## **WORKING CAPITAL**

Working capital management is also one of the important part of the financial management. It is concerned with short-term finance of the business concern which is a closely related trade between profitability and liquidity. Efficient working capital management leads to improve the operating performance of the business concern and it helps to meet the shortterm liquidity. Hence, study of working capital management is not only an important part of financial management but also are overall management of the business concern. Working capital is described as the capital which is not fixed but the more common uses of the working capital is to consider it as the difference between the book value of current assets and current liabilities.

### **1.10 MEANING AND USES OF WORKING CAPITAL**

Capital of the concern may be divided into two major headings.



1. Fixed Capital
2. working capital

Fixed capital means that capital, which is used for long-term investment of the business concern. For example, purchase of permanent assets. Normally it consists of non-recurring in nature. Working Capital is another part of the capital which is needed for meeting day to day requirement of the business concern. For example, payment to creditors, salary paid to workers, purchase of raw materials etc., normally it is recurring in nature. It can be easily converted into cash. Hence, it is also known as short-term capital.

Definitions According to the definition of Mead, Baker and Malott, “Working Capital means Current Assets”.

According to the definition of J.S.Mill, “The sum of the current asset is the working capital of a business”.

According to the definition of Weston and Brigham, “Working Capital refers to a firm’s investment in short-term assets, cash, short-term securities, accounts receivables and inventories”.

According to the definition of Bonneville, “Any acquisition of funds which increases the current assets, increase working capital also for they are one and the same”.

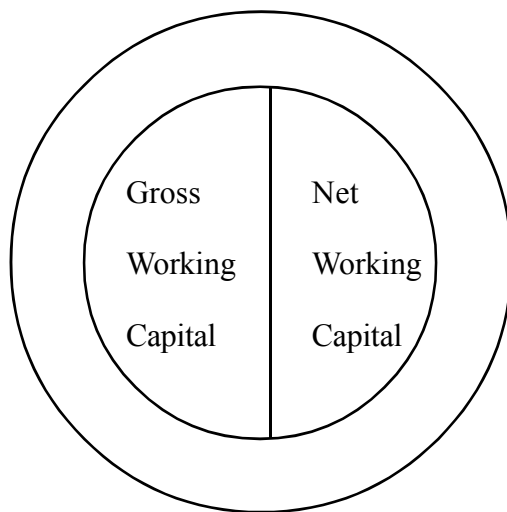
According to the definition of Shubin, “Working Capital is the amount of funds necessary to cover the cost of operating the enterprises”.

According to the definition of Genestenberg, “Circulating capital means current

assets of a company that are changed in the ordinary course of business from one form to another, for example, from cash to inventories, inventories to receivables, receivables to cash”.

### 1.11 CONCEPT OF WORKING CAPITAL

Working capital can be classified or understood with the help of the following two important concepts.



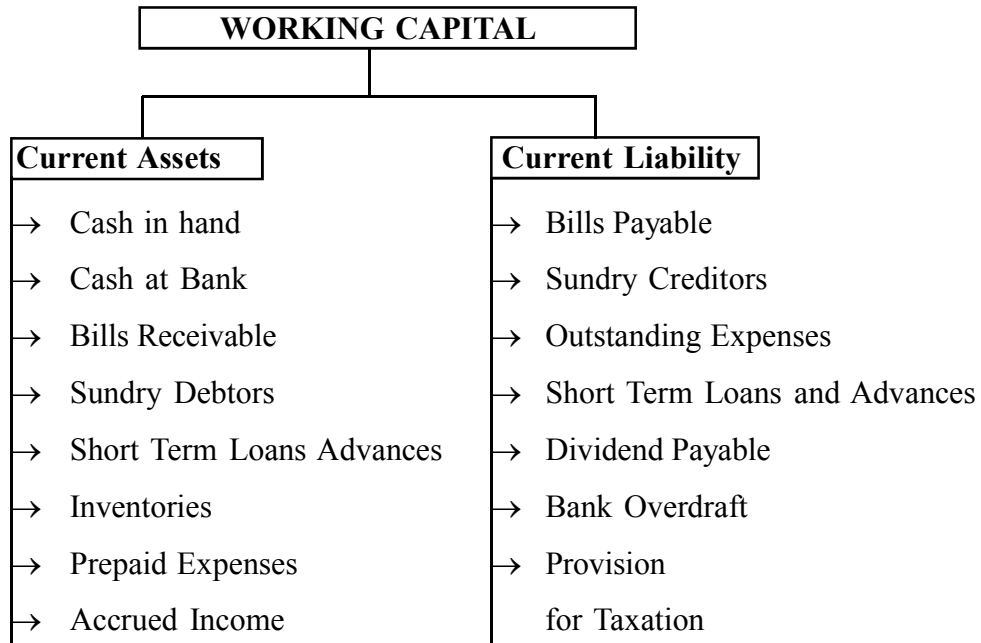
#### WORKING CAPITAL CONCEPT

**Gross Working Capital:** Gross Working Capital is the general concept which determines the working capital concept. Thus, the gross working capital is the capital invested in total current assets of the business concern. Gross Working Capital is simply called as the total current assets of the concern.

**Net Working Capital:** Net Working Capital is the specific concept, which, considers both current assets and current liability of the concern. Net Working Capital is the excess of current assets over the current liability of the concern during a particular period. If the current assets exceed the current liabilities it is said to be positive working capital; it is reverse, it is said to be Negative working capital.

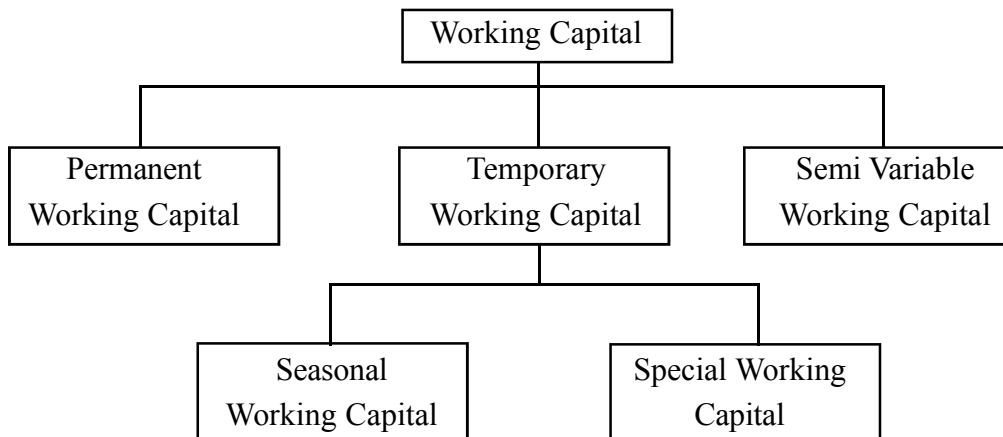
### 1.12 COMPONENTS OF WORKING CAPITAL

Working capital constitutes various assets and liabilities. This can be illustrated by the following chart:-

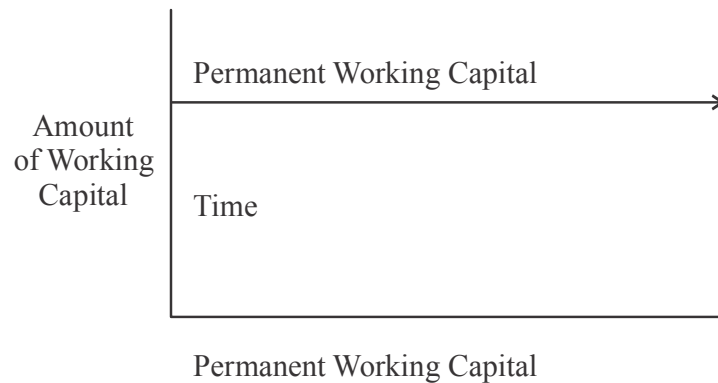


### 1.13 TYPES OF WORKING CAPITAL

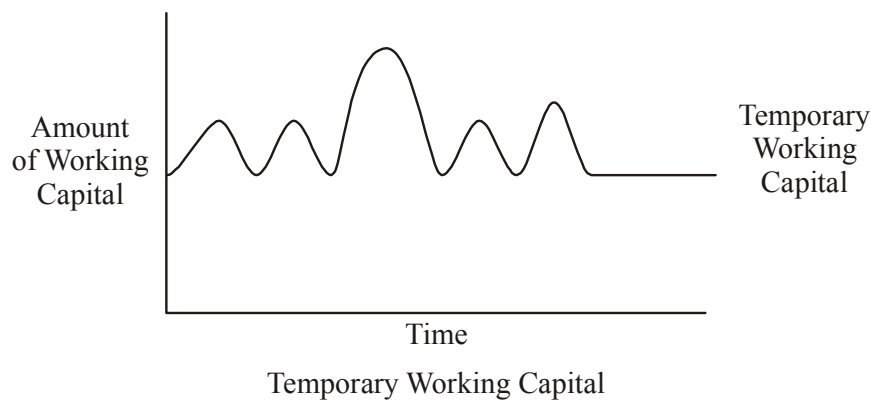
Working Capital may be classified into three important types on the basis of time:-



- 1. Permanent Working Capital:** It is also known as Fixed Working Capital. It is the capital that the business concern must maintain certain amount of capital at minimum level at all times. The level of Permanent Capital depends upon the nature of the business. Permanent or Fixed Working Capital will not change irrespective of time or volume of sales.

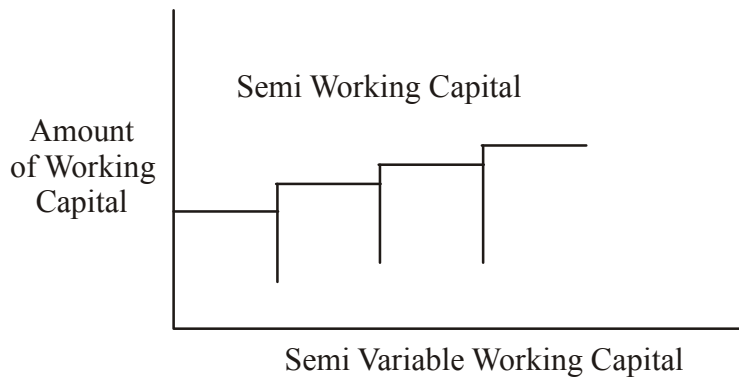


- 2. Temporary Working Capital:** It is also known as variable working capital. It is the amount of capital which is required to meet the Seasonal demands and some special purposes. It can be further classified into Seasonal Working Capital and Special Working Capital. The capital required to meet the seasonal needs of the business concern is called as Seasonal Working Capital. The capital required to meet the special exigencies such as launching of extensive marketing campaigns for conducting research, etc is called as special working capital.



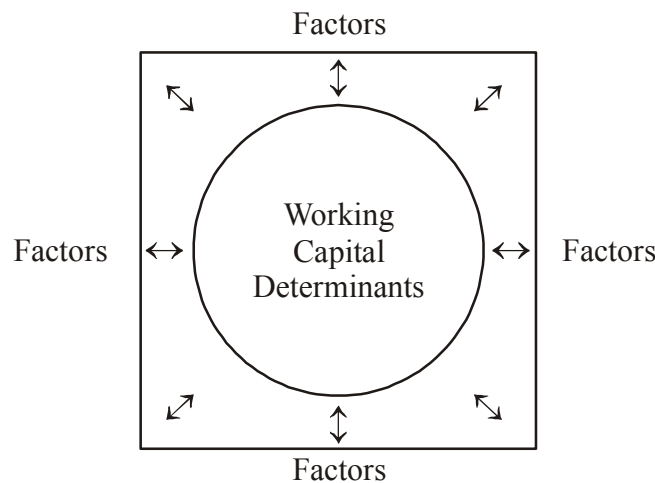


3. **Semi Variable Working Capital:** Certain amount of Working Capital is in the field level up to a certain stage and after that it will increase depending upon the change of sales or time.



#### 1.14 FACTORS DETERMINING WORKING CAPITAL REQUIREMENTS

Working Capital requirements depends upon various factors. There are no set of rules or formula to determine the Working Capital needs of the business concern. The following are the major factors which are determining the Working Capital requirements :-



1. **Nature of business:** Working Capital of the business concerns largely depend upon the nature of the business. If the business concerns follow

rigid credit policy and sell goods only for cash, they can maintain lesser amount of Working Capital. A transport company maintains lesser amount of Working Capital while a construction company maintains larger amount of Working Capital.

2. **Production cycle:** Amount of Working Capital depends upon the length of the production cycle. If the production cycle length is small, they need to maintain lesser amount of Working Capital. If it is not, they have to maintain large amount of Working Capital.
3. **Business cycle:** Business fluctuations lead to cyclical and seasonal changes in the business condition and it will affect the requirements of the Working Capital. In the booming conditions, the Working Capital requirement is larger and in the depression condition, requirement of Working Capital will reduce. Better business results lead to increase the Working Capital requirements.
4. **Production policy:** It is also one of the factors which affects the Working Capital requirement of the business concern. If the company maintains the continues production policy, there is a need of regular Working Capital. If the production policy of the company depends upon the situation or conditions, Working Capital requirement will depend upon the conditions laid down by the company
5. **Credit policy:** Credit policy of sales and purchase also affect the Working Capital requirements of the business concern. If the company maintains liberal credit policy to collect the payments from its customers, they have to maintain more Working Capital. If the company pays the dues on the last date it will create the cash maintenance in hand and bank.
6. **Growth and expansion:** During the growth and expansion of the business concern, Working Capital requirements are higher, because it needs some additional Working Capital and incurs some extra expenses at the initial stages.
7. **Availability of raw materials:** Major part of the Working Capital requirements are largely depend on the availability of raw materials. Raw

materials are the basic components of the production process. If the raw material is not readily available, it leads to production stoppage. So, the concern must maintain adequate raw material; for that purpose, they have to spend some amount of Working Capital.

8. **Earning capacity:** If the business concern consists of high level of earning capacity, they can generate more Working Capital, with the help of cash from operation. Earning capacity is also one of the factors which determine the Working Capital requirements of the business concern.

### 1.15 COMPUTATION (OR ESTIMATION) OF WORKING CAPITAL

Working Capital requirement depends upon number of factors, which are already discussed in the previous parts. Now the discussion is on how to calculate the Working Capital needs of the business concern. It may also depend upon various factors but some of the common methods are used to estimate the Working Capital.

**A. Estimation of components of working capital method:** Working capital consists of various current assets and current liabilities. Hence, we have to estimate how much current assets as inventories required and how much cash required to meet the short term obligations. Finance Manager first estimates the assets and required Working Capital for a particular period.

**B. Percent of sales method:** Based on the past experience between Sales and Working Capital requirements, a ratio can be determined for estimating the Working Capital requirement in future. It is the simple and tradition method to estimate the Working Capital requirements. Under this method, first we have to find out the sales to Working Capital ratio and based on that we have to estimate Working Capital requirements. This method also expresses the relationship between the Sales and Working Capital.

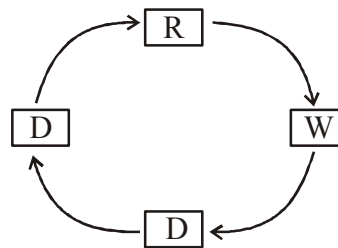
**C. Operating cycle:** Working Capital requirements depend upon the operating cycle of the business. The operating cycle begins with the acquisition of raw material and ends with the collection of receivables.

Operating cycle consists of the following stages :

- 1) Raw Material and Storage Stage, (R)

- 2) Work in Process Stage, (W)
- 3) Finished Goods Stage, (F)
- 4) Debtors Collection Stage, (D)
- 5) Creditors Payment Period Stage, (C)

$$O = R + W + F + D - C$$



Working Capital Cycle

**1.1 Prepare an estimate of working capital requirement from the following information of a trading concern:**

(a) Project annual sales	1,00,000 units
(b) Selling price	₹ 8 per unit
(c) % age of net profit on sales	25%
(d) Average credit period allowed to customers	8 weeks
(e) Average credit period allowed by suppliers	4 weeks
(f) Average stock holding in terms of sales requirement	12 weeks
(g) Allow 10% for contingencies	

**Solution :**

Statement of Working Capital Requirements	
	₹
<i>Current Assets</i>	
Debtors (8 weeks) : 6,00,000×8/52	92,308
(At Cost)	
Stock (12 weeks) : 6,00,000×12/52	1,38,462
	2,30,770

<i>Less : Current Liabilities :</i>	
Creditors (4 weeks) : 6,00,000×4/52	46,154
Net working capital	1,84,616
Add 10% for contingencies	18,462
Working Capital Required	2,03,078

**Working Notes :**

(a) Sales = 1,00,000 × 8 = ₹ 8,00,000

Profit = 25% of ₹ 8,00,000 = ₹ 2,00,000

Cost of Sales = ₹ 6,00,000

(b) As, it is a trading concern, cost of sales are assumed to be the purchases.

(c) Profits have been ignored as funds provided by profits may or may not be used as working capital.

**1.2 The following information has been provided by a company for the year ended 30.6.2008:**

<b>Liabilities</b>	<b>₹</b>	<b>Assets</b>	<b>₹</b>
Equity share capital	2,00,000	Fixed assets less depreciation	3,00,000
8% Debentures	1,00,000	Inventories	1,00,000
Reserves and surplus	50,000	Sundry debtors	70,000
Long-term loans	50,000	Cash and bank	10,000
Sundry creditors	80,000		
	4,80,000		4,80,000

Sales for the year ended 30.6.2008 amounted to ₹ 10,00,000 and it is estimated that the same will amount to ₹ 12,00,000 for the year 2008-09.

You are required to estimate the working capital requirements for the year 2008-09 assuming a linear relationship between sales and working capital.

Solution :

<b>Estimation of Working Capital Requirments</b>			
	<b>Actual 2007-2008</b> ₹	<b>Percentage to Sales 2007-08</b>	<b>Estimate 2008-09</b> ₹
Sales	<u>10,00,000</u>	<u>100</u>	<u>12,00,000</u>
<b>Current Assets :</b>			
Inventories	1,00,000	10	1,20,000
Sundry debtors	70,000	7	84,000
Cash and bank	<u>10,000</u>	<u>1</u>	<u>12,000</u>
Total Current Asset (CA)	<u>1,80,000</u>	<u>18</u>	<u>2,16,000</u>
<b>Current Liabilities :</b>			
Sundry creditors	<u>80,000</u>	<u>8</u>	<u>96,000</u>
Total Current Liabilities	<u>80,000</u>	<u>8</u>	<u>96,000</u>
Working Capital (CA-CL)	<u>1,00,000</u>	<u>10</u>	<u>1,20,000</u>

1.3 From the following information, compute the working capital turnover ratio:

	₹
Cash	10,000
Bills Receivables	5,000
Sundry Debtors	25,000
Stocks	20,000
Sundry Creditors	30,000
Cost of Sales	1,50,000

Solution :

<b>Working Capital Turnover Ratio</b>	= $\frac{\text{Cost of Sales}}{\text{Net Working Capital}}$
Current assets	= ₹ 10,000 + 5,000 + 25,000 + 20,000
	= ₹ 60,000
Current liabilities	= CA-CL = ₹ 60,000-30,000

$$\begin{aligned} \text{Net working capital} &= ₹ 30,000 \\ \text{So, Working Capital Turnover Ratio} &= \frac{1,50,000}{30,000} = 5 \text{ times} \end{aligned}$$

### 1.16 SUMMARY

Accounting, over the years, has grown from simple score-keeping and reporting to a subject with an advisory capacity to aid in a complex and continuous process of decision-making in large complex organizations. Today accountants have come to occupy corporate executive positions. Accounting knowledge and information processing are considered essential for effective and efficient performance of selecting the best course of action from among the available alternatives. As a developing subject with a dynamic nature it has come a long way from the mere use of traditional techniques and tools. At present, accounting is able to provide a more strategic business orientation. Management Accounting, if adopted and practised with all its features, would no doubt bring about better control and better performance in any kind of organisation. Cooperatives, especially in the developing countries, have so much to gain by adopting the Management Accounting tools and techniques in their day-to-day operations.

### 1.17 GLOSSARY

**Management accounting:** Management accounting is a profession that involves partnering in management decision making, devising planning and performance management systems, and providing expertise in financial reporting and control to assist management in the formulation and implementation of an organization's strategy.

**Cost accounting :** A method of accounting in which all costs incurred in carrying out an activity or accomplishing a purpose are collected, classified, and recorded. This data is then summarized and analyzed to arrive at a selling price, or to determine where savings are possible.

**Financial accounting (or financial accountancy):** It is the field of accounting concerned with the summary, analysis and reporting of financial transactions pertaining to a business.

**Working capital:** The capital of a business which is used in its day-to-day trading operations, calculated as the current assets minus the current liabilities.

### **1.18 SELF-TEST QUESTIONS**

1. What do you mean by management accounting? Explain giving examples.
2. What are the functions of a management accountant? Elaborate each one of them.
3. Explain the benefits of management accounting in the business sector and service sector.
4. Distinguish management accounting from financial accounting and cost accounting.
5. Explain the limitations of management accounting.
6. What is working capital? Define it.
7. Discuss the concept of working capital.
8. Critically explain the factors affecting the requirement of working capital.
9. Explain the concept of working capital along with its uses.
10. Discuss the scope of management accounting.
11. Compare and contrast management accounting and financial accounting.
12. Prepare an estimation of working capital requirements with the help of a hypothetical example.
13. Give the classification of working capital with suitable examples. On the formation of new business, what considerations are taken into account in estimating the amount of working capital needed ?

### **1.19 SUGGESTED READINGS**

1. Ashish K. Bhattacharya, Principles and Practices of Cost Accounting (3<sup>rd</sup>), New Delhi: Prentice Hall of India Private Limited, 2004.



2. Charles T. Horngren, Cost Accounting, A Managerial Emphasis, Prentice Hall Inc., 1973.
3. D. T. Decoster and E. L. Schafer, Management Accounting, New York: John Willey and Sons, 1979.
4. John G. Blocker and Wettmer W. Keith, Cost Accounting, New Delhi: Tata Mc Grw Publishing Co. Ltd., 1976.
5. R. K. Sharma and Shashi K. Gupta, Management Accounting-Principles and Practice (7<sup>th</sup>), New Delhi: Kalyani Publishers, 1996.

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## **COST VOLUME PROFIT ANALYSIS**

### **STRUCTURE**

- 2.1 Introduction
- 2.2 Objectives
- 2.3 Meaning of marginal cost and product pricing
- 2.4 Meaning of marginal costing
- 2.5 Marginal costing Vs absorption costing
- 2.6 Assumptions of marginal costing
- 2.7 Features of marginal costing
- 2.8 Advantages of marginal costing
- 2.9 Limitations of marginal costing
- 2.10 Profit volume Ratio- Meaning and importance
- 2.11 Break even point- Meaning and uses  
Managerial applications of marginal costing
- 2.12 Pricing decision
- 2.13 Profit planning
- 2.14 Make or buy decision
- 2.15 Selection of profitable sales mix

- 2.16 Numerical problems on cost – volume profit analysis
- 2.17 Summary
- 2.18 Glossary
- 2.19 Self assessment Questions
- 2.20 Suggested reading

## **2.1 Introduction**

It is important for managers to ascertain the cost behavior pattern and use it to estimate the total cost, total revenues and thereby profits at various sales volumes. The cost revenue relationship holds for a short period. Therefore, this relationship cannot be used to estimate long-term performance of the firm. However, this short— term validity helps to maximise profit with given resources. For the purpose of taking tactical decisions managers use the marginal costing techniques because these short-term decisions influence fixed costs. To understand the use of Marginal costing techniques, we have to study Cost-volume-profit (CVP) analysis. The Cost-volume- profit (CVP) analysis is the study of the effects on future profit of changes in fixed cost, variable cost, sales price, quantity and mix. The aim of CVP analysis is to estimate the total cost, total revenue and thereby profit of various sales volumes. Managers use this technique extensively to determine the break-even point and margin of safety. Break-even point is the level of activity at which there is neither profit nor loss. Margin of safety ratio indicates the percentage by which forecast turnover exceeds or falls short of breakeven turnover. The CVP analysis assumes that output is the only cost and revenue driver.

## **2.2 OBJECTIVE:**

- To describes CVP analysis.
- To explore the use of the marginal costing technique for tactical decisions in different manufacturing concerns.

## **2.3 MARGINAL COST AND PRODUCT PRICING**

A long-term pricing policy should aim to recover more than the ‘full cost’ to

ensure a reasonable return on capital employed. A firm cannot survive if it has to sell its products continuously below 'full cost'. Marginal cost may be used as a basis for short-term pricing decisions. Usually, marginal cost is used to determine prices for non-repetitive orders under difficult business conditions or to use spare capacity when acceptance of lower contributions and profit margins may be necessary. When capacity is unused, acceptance of an order with lower contribution helps partial recovery of the fixed cost. Factors to be considered in fixing selling prices when demand is below normal are the amount and the rate of contribution which the proposed selling price would yield; probability of securing an order with higher contribution during the period of execution of the order; proposed concession, when compared with the normal selling price on full cost basis; probable adverse effects on future sales. When one or more resources are scarce, (e.g. material is scarce), the first consideration must be to reserve the same for orders that would yield the highest contribution per unit of the scarce resource (the limiting factor). A decision to sell at a lower price might also have an adverse effect on the firm's general level of selling prices in its established market. This aspect should also be carefully examined before accepting an order with contribution lower than the normal contribution.

Other factors, which strongly justify acceptance of an order with lower contribution at the time adverse trade situations, are to: (a) hold together the skilled labour force; (b) keep the plant and machinery in operation and the workers busy; (c) utilize materials already received; (d) avoid costs involved in the closing and re-opening of the plant; (e) maintain the sales of complementary products at a satisfactory level; and (f) maintain position in established markets to avoid additional sales promotion expenses in reestablishing the markets.

Selling below full cost prices, even under a normal situation, may be adopted in order to: (a) introduce a new product, (b) execute an order in a special market segment (say, defense supply) which is immune from other market segments; (c) expand the export market; and (d) dispose of a product which deteriorates fast.

## **2.4 MEANING OF MARGINAL COSTING**

Marginal costing, as one of the tools of management accounting helps

management in making certain decisions. It provides management with information regarding the behaviour of costs and the incidence of such costs on the profitability of an undertaking. Marginal costing is defined as “the ascertainment of marginal costs and of the effect on profit of changes in volume or type of output by differentiating between fixed costs and variable costs”. Marginal costing is not a separate costing. It is only a technique used by accountants to aid management decision. It is also called as “Direct Costing” in U.S.A. This technique of costing is also known as “Variable Costing”, “Differential Costing” or “Out-of-pocket” costing. Marginal cost is the cost of one unit of product or service which would be avoided if that unit were not produced or provided. According to CIMA Terminology “Marginal Costing is the ascertainment of marginal costs and of the effect on profit of changes in volume or type of output by differentiating between fixed costs and variable costs in this technique of costing only variable costs are charged to operations, processes or products leaving all indirect costs to be written off against profits in the period in which they arise”. Thus marginal costing is the accounting system in which variable costs are charged to cost units and fixed costs of the period are written-off in full against the aggregate contribution. Its special value is in decisionmaking. It is a technique of applying the existing methods in a particular manner in order to bring out the relationship between profit and volume of output.

**ABSORPTION COSTING :** Absorption Costing is a conventional technique of ascertaining cost. It is the practice of charging all costs, both variable and fixed to operations, processes or products and is also known as ‘Full Costing Technique.’ In this technique of costing, cost is made up of direct costs plus overhead costs absorbed on some suitable basis. Here, cost per unit remains the same only when the level of output remains the same for some duration. None the less, the level of output cannot remain the same forever and so does the cost per unit because the fixed cost remains the same despite the changes in the level of output. The change in the cost per unit with a change in the level of output in Absorption Costing Technique poses a problem to the management in taking managerial decisions. Absorption Costing is useful if there is only one product; when there is no inventory and overhead recovery rate is based on normal capacity instead of

actual level of activity. Two distinguishing features of Absorption Costing are that fixed factory expenses are included in unit cost as well as inventory value.

## **2.5 MARGINAL COSTING VS ABSORPTION COSTING:**

The difference between marginal costing and absorption costing is as below:

1. In the marginal costing only variable cost is considered for product costing and inventory valuation, whereas in the absorption costing both fixed cost and variable cost are considered for product costing and inventory valuation.
2. In the marginal costing, there is a different treatment of fixed overhead. Fixed cost is considered as period cost and by Profit/Volume ratio (P/V ratio), profitability of different products is judged. On the other hand, in absorption costing system, the fixed cost is charged to cost of production. A reasonable share of fixed cost is to be borne by each product and thereby subjective apportionment of fixed overheads influences the profitability of product.
3. In the marginal costing, the presentation of data is so oriented that the total contribution and contribution from each product gets highlighted. In absorption costing, the presentation of cost data is on conventional pattern. After deducting fixed overhead, the net profit of each product is determined.
4. In the marginal costing, the unit cost of production does not get affected by the difference in the magnitude of opening stock and closing stock. Whereas, in the absorption costing, due to the impact of the related fixed overheads, the unit cost of production gets affected by the difference in the magnitude of opening stock and closing stock.
5. In the marginal costing, classification of expenses is based on nature, i.e. Fixed and Variable whereas, in Absorption Costing, classification of expenses is based on functions, i.e. Production, Administration and Selling & Distribution.
6. In the marginal costing, fixed overhead Expenditure Variance is to be computed for Variance Reporting. There is no Volume Variance since

Fixed Overheads are not absorbed. On the other hand under the Absorption Costing, in Variance Reporting, FOH Expenditure and Volume variances can be computed. Volume Variances can also be sub classified into Capacity, Efficiency and Calendar variances.

<b>Marginal Costing</b>	<b>Absorption Costing</b>
1. Only variable costs are considered for product costing and inventory valuation.	Both fixed and variable costs are considered for product costing and inventory valuation.
2. Fixed costs are regarded as period costs. The Profitability of different products is judged by their P/V ratio.	Fixed costs are charged to the cost of production. Each product bears a reasonable share of fixed cost and thus the profitability of a product is influenced by the apportionment of fixed costs.
3. Cost data presented highlight the total contribution of each product.	Cost data are presented in conventional pattern. Net profit of each product is determined after subtracting fixed cost along with their variable costs.
4. The difference in the magnitude of opening stock and closing stock does not affect the unit cost of production.	The difference in the magnitude of opening stock and closing stock affects the unit cost of production due to the impact of related fixed cost.
5. In case of marginal costing the cost per unit remains the same, irrespective of the production as it is valued at variable cost.	In case of absorption costing the cost per unit reduces, as the production increases as it is fixed cost which reduces, whereas, the variable cost remains the same per unit.

## **2.6 ASSUMPTIONS OF MARGINAL COSTING:**

The technique of marginal costing is based upon the following assumptions:

- a. All elements of cost—production, administration and selling and distribution—can be segregated into fixed and variable components.
- b. Variable cost remains constant per unit of output irrespective of the level of output and thus fluctuates directly in proportion to changes in the volume of output.
- c. The selling price per unit remains unchanged or constant at all levels of activity.
- d. Fixed costs remain unchanged or constant for the entire volume of production.
- e. The volume of production or output is the only factor which influences the costs.

## **2.7 FEATURES OF MARGINAL COSTING:**

The main features of marginal costing are as follows:

- (1) **Cost Classification:** The marginal costing technique makes a sharp distinction between variable costs and fixed costs. It is the variable cost on the basis of which production and sales policies are designed by a firm following the marginal costing technique.
- (2) **Stock/Inventory Valuation:** Under the marginal costing, inventory/stock for profit measurement is valued at the marginal cost. It is in sharp contrast to the total unit cost in costing method
- (3) **Marginal Contribution:** Marginal costing technique makes use of marginal contribution for marking various decisions. Marginal contribution is the difference between sales and marginal cost. It forms the basis for judging the profitability of different products or departments.
- (4) **Selling Price Determination:** Selling price of the product in the marginal costing method is determined based on the cost plus the contribution always.



Here, the contribution, of course, means the difference between the sales and the variable cost.

- (5) Profitability: The profitability of the product/department is based on the contribution made available by each product/department.
- (6) Fixed Costs vs. Period Costs: Fixed costs are treated as period costs and are charged to the costing Profit and Loss Account of the period in which they are incurred.

## **2.8 ADVANTAGES OF MARGINAL COSTING:**

1. Simple Method: Marginal costing is simple to understand. It is calculated only on the basis of variable costs. By not charging fixed overhead to the cost of production, the effect of varying charges per unit is avoided.
2. Overhead Simplification: In the stock valuation, the marginal costing prevents the illogical carry forward of some proportion of current years fixed overhead to the next year. It reduces the degree of over or under recovery of overheads due to the separation of fixed overheads from production cost.
3. Effective for Sales and Production Policy: The effects of alternative sales or production policies can be more readily available and assessed, and decisions taken would yield the maximum return to the business.
4. It eliminates large balances left in overhead control accounts which indicate the difficulty of ascertaining an accurate overhead recovery rate.
5. Practical cost control is greatly facilitated. By avoiding arbitrary allocation of fixed overhead, efforts can be concentrated on maintaining a uniform and consistent marginal cost. To the management, it is useful at various levels.
6. It helps in the planning of short-term profit by breakeven and profitability analysis; both in terms of quantity and graphs. Comparative profitability and performance between two or more products and divisions can easily be assessed and brought to the notice of the management for decision making.

## **2.9 LIMITATIONS OF MARGINAL COSTING:**

1. The separation of costs into fixed and variable is difficult and sometimes gives misleading results.
2. Normal costing systems also apply overhead in the situation of normal operating volume and this shows that no advantage is gained by the marginal costing.
3. In the marginal costing, stocks and work-in-progress are understated. The exclusion of fixed costs from inventories affects the profit, and true and fair view of financial affairs of an organization may not be clearly visible.
4. Volume variance in the standard costing also discloses the effect of fluctuating output on fixed overhead. The marginal cost data becomes unrealistic in case of highly fluctuating levels of production, e.g., in case of seasonal factories.
5. Application of fixed overhead depends on estimates and not on the actual and as such there may be under or over absorption of the same.
6. Control affected by means of the budgetary control is also accepted by many. In order to know the net profit, one should not be satisfied with the contribution and hence, fixed overhead is also a valuable item. A system which ignores fixed costs is less effective, for a major portion of fixed cost is not taken care of in the marginal costing.
7. In practice, sales price, fixed cost and variable cost per unit may vary. Thus, the assumptions underlying the theory of marginal costing sometimes becomes unrealistic. For the long term profit planning, absorption costing is the only answer.

## **2.10 PROFIT-VOLUME RATIO: MEANING AND IMPORTANCE**

Profit Volume Ratio means contribution for every Rs. 100 Sales Value. It is always calculated on the percentage basis or at times it is compared with the Sales Value. When the contribution from sales is expressed as a sales value percentage, it is known as profit-volume ratio (or P/V ratio). The relationship between the

contribution and the sales is expressed by it. Sound 'financial health' of a company's product is indicated by better P/V ratio. The change in the profit due to the change in volume is reflected by this ratio. If expressed on equal footing with the sales, it will show how large the contribution will appear. If size of the sales is Rs.100, then the P/V Ratio of 60% will mean that the contribution is Rs. 60. One important characteristic of P/V ratio is that at all levels of output it remains constant because at various levels the variable cost as a proportion of the sales remains constant. When P/V ratio is considered in conjunction with the margin of safety, it becomes particularly useful. P/V ratio can be referred to by other terms such as: (a) marginal income ratio, (b) contribution to sales ratio, and (c) variable profit ratio.

$$\begin{aligned}
 \text{P/V Ratio} &= \frac{\text{Contribution}}{\text{Sales}} \times 100 && \text{(or)} \\
 &= \frac{\text{Sales} - \text{Variable Cost}}{\text{Sales}} \times 100 && \text{(or)} \\
 &= \frac{\text{Fixed Expenses} + \text{Profit}}{\text{Sales}} \times 100 && \text{(or)} \\
 &= \frac{\text{Change in Profits or Contribution}}{\text{Change in Sales}} \times 100
 \end{aligned}$$

It is also possible to express the ratio in terms of percentage by multiplying by 100. Thus a relationship between the contribution and the sales is established by the profit/volume ratio. Hence, it might be better to call it a Contribution/Sales ratio (or C/S ratio), though the term Profit/Volume ratio (P/V ratio) is now widely used. In addition to the above, it is possible to compute the ratio by comparing the change in the contribution with the change in the sales or the change in the profit with the change in the sales. it is possible to compute the ratio. Because it is assumed that the fixed cost will remain the same at different levels of output, an increase in the contribution will mean an increase in the profit.

$$\text{P / V ratio} = \frac{\text{Change in contribution}}{\text{Change in Sales}}$$

## **IMPORTANCE OF PROFIT-VOLUME (P/V) RATIO**

Profit volume (or contribution-sales) ratio is a logical extension of marginal costing. It is the study of the interrelationships of cost behaviour patterns, levels of activity and the profit that results from each alternative combination.

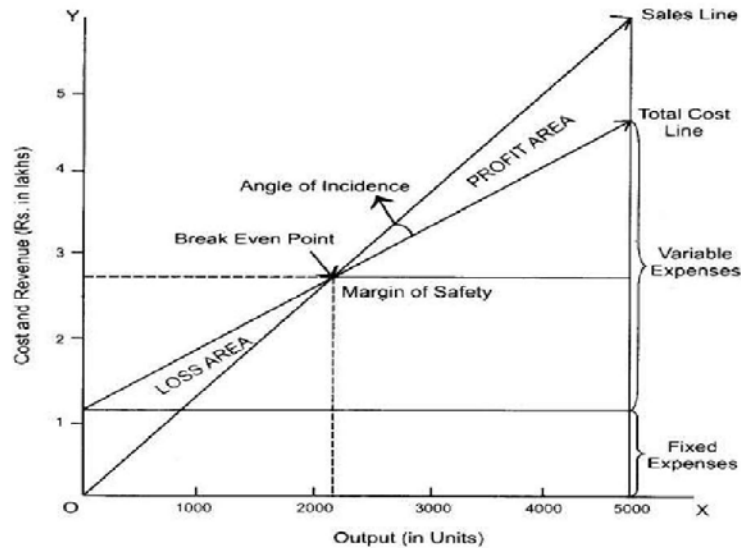
The significance of profit volume ratio may be enumerated from the following application which are as under:

- (a) Ascertainment of profit on a particular level of sales volume.
- (b) Determination of break-even point.
- (c) Calculation of sales required to earn a particular level of profit.
- (d) Estimation of the volume of sales required to maintain the present level of profit in case selling prices are to be reduced by a stipulated margin.
- (e) Useful in developing flexible budgets for cost control purposes.
- (f) Identification of minimum volume of activity that the enterprise must achieve to avoid incurring losses.
- (g) Provision of data on relevant costs for decisions relating to pricing, keeping or dropping product lines, accepting or rejecting particular orders, make or buy decision, sales mix planning, altering plant layout, channels of distribution specification, promotional activities etc.
- (h) Guiding in fixation of selling price where the volume has a close relationship with the price level.
- (i) Evaluation of the impact of cost factors on profit.

### **2.11 BREAK EVEN ANALYSIS:**

When someone asks a layman about his business he may reply that it is alright. But a technical man may reply that it is break even. So, Break Even means the volume of production or sales where there is no profit or loss. In other words, Break Even Point is the volume of production or sales where total costs are equal to revenue. It helps in finding out the relationship of costs and revenues to output.

In understanding the breakeven point, cost, volume and profit are always used. The break even analysis is used to answer many questions of the management in day to day business. The formal break even chart is as follows:



When no. of units are expressed on X-axis and costs and revenues are expressed on Y-axis, three lines are drawn i.e., fixed cost line, total cost line and total sales line. In the above graph we find there is an intersection point of the total sales line and total cost line and from that intersection point if a perpendicular is drawn to X-axis, we find break even units. Similarly, from the same intersection point a parallel line is drawn to X-axis so that it cuts Y-axis, where we find Break Even point in terms of value. This is how, the formal pictorial representation of the Break Even chart.

At the intersection point of the total cost line and total sales line, an angle is formed called Angle of Incidence, which is explained as follows:

**Angle of Incidence:** Angle of Incidence is an angle formed at the intersection point of total sales line and total cost line in a formal break even chart. If the angle is larger, the rate of growth of profit is higher and if the angle is lower, the rate of growth of profit is lower. So, growth of profit or profitability rate is depicted by Angle of Incidence.

### **Break Even Analysis (or) Cost-Volume-Profit Analysis (CVP analysis):**

From the breakeven charts breakeven point and profits at a glance can be found out. Besides, management makes profit planning with the help of breakeven charts. It can clearly be understood by way of charts to know the changes in profit due to changes in costs and output. Such profit planning is made with the variables mainly cost, profit and volume, such an analysis is called breakeven analysis. Throughout the charts relationship is established among the cost, volume and profit, it is also called Cost-Volume-Profit Analysis (CVP analysis).

#### **Uses of Break-Even Analysis:**

- (i) It helps in the determination of selling price which will give the desired profits.
- (ii) It helps in the fixation of sales volume to cover a given return on capital employed.
- (iii) It helps in forecasting costs and profit as a result of change in volume.
- (iv) It gives suggestions for shift in sales mix.
- (v) It helps in making inter-firm comparison of profitability.
- (vi) It helps in determination of costs and revenue at various levels of output.
- (vii) It is an aid in management decision-making (e.g., make or buy, introducing a product etc.), forecasting, long-term planning and maintaining profitability.
- (viii) It reveals business strength and profit earning capacity of a concern without much difficulty and effort.

## **2.12 PRICING DECISION**

### **1. Decision Making**

The process of decision making involves choice of alternatives. Many quantitative factors are to be considered while taking decisions. A cost Accountant examines

each situation in depth and decides the kind of cost concepts to be used for decision making. A cost accountant should always consider following four points for decision making.

1. He must establish why a choice is necessary.
2. He must analyze each alternative separately.
3. Decide how each alternative influences choice of decision maker.
4. Select the best course of action.

Decision making involves prediction. It cannot change the past. It is expected to influence the future.

#### TYPES OF DECISION

There are two types of decision:

1. Long term decision :

Long-term decision force the management to look beyond the current year. Therefore, time value of money is given consideration.

2. Short-term decisions :

These decisions involve selection of alternatives. These decision are implemented within one year.

#### **2. Pricing decision :**

Since marginal cost per unit is constant from period to period within a short span of time, firm decisions on pricing policy can be taken, If fixed cost is included, the unit cost will change from day to day depending upon the volume of output. This will make decision task difficult. Decision regarding has to be taken under the following situation :

- a) Under normal circumstances;
- b) In times of competition;
- c) In times of trade depression;

- d) While accepting additional orders, and
- e) While exporting

In majority of the situations, the technique of marginal costing helps the manager in taking decision. The technique of marginal costing can be applied for fixing the price for a short period. However, for a long period, the total cost will have to be considered. When this technique is used for pricing, the important principle that governs the decision is that the price should be equal to marginal cost plus a certain amount. The amount to be added will vary from industry to industry. It will also depend on the nature of competition, demand and supply position, pricing policy and other factors related to pricing. If the price is equal to marginal cost, the amount of loss will be equal to fixed cost. Pricing at or below marginal cost may be done under the following circumstances:

- a) For popularizing the new product.
- b) For exploiting sales opportunities in foreign market.
- c) For driving out the competitor from the market.
- d) For retaining the employees and maintaining the production.
- e) For moving perishable product.
- f) For pushing the sale of another product by selling one product at a lower price

When additional orders are accepted or additional markets are explored at a price below normal price to utilize idle capacity, it should be seen that normal market and goodwill of the company will not be affected.

Order from local merchant should not be accepted at a lower price as it's the relationship with customers.

### **2.13 PROFIT PLANNING**

Profit planning is a plan for future operation (or) or planning budget to attain the given objective or to attain the maximum profit. The volume of sale required to maintain a desired profit can be ascertained. Marginal costing helps the profit



planning i.e., planning for future operations in such a way as to maximise the profits or to maintain a specified level of profit. Absorption costing fails to bring out the correct effect of change in sale price; variable cost or product mix on the profits of the concern but that is possible with the help of marginal costing. Profits are increased or decreased as a consequence of fluctuations in selling prices, variable costs and sales quantities in case there is fixed capacity to produce and sell.

**2.1.** A company manufactures a single product having a marginal cost of Re. 0.75 per unit. Fixed costs are Rs. 12,000. The market is such that up to 40,000 units can be sold at Rs. 1.50 per unit, but any additional sales must be made at Re. 1.00 per unit. There is a planned profit of Rs. 20,000. How many units must be made and sold?

**Solution:**

$$\text{Contribution desired} = \text{Fixed Cost} + \text{Desired Profit}$$

$$= \text{Rs. } 12,000 + \text{Rs. } 20,000 = \text{Rs. } 32,000$$

$$\text{Contribution from 40,000 units} = 40,000 \times \text{Rs. } (1.50 - 0.75) = \text{Rs. } 30,000$$

**Additional units to be produced and sold at Re. 1.00 per unit after 40,000 units:**

$$\text{Contribution to be earned after 40,000 units} = \text{Rs. } (32,000 - 30,000) = \text{Rs. } 2,000$$

$$\text{New contribution per unit} = \text{Re. } (1.00 - 0.75) = \text{Re } 0.25$$

$$\text{Additional units to be produced for contribution of Rs. } 2,000$$

$$= \text{Rs. } 2,000 \times 100/25 = 8,000 \text{ units}$$

$$\text{Total units to be produced to earn planned profit of Rs. } 20,000$$

$$= 40,000 \text{ units} + 8,000 \text{ units} = 48,000 \text{ units.}$$

**2.14 MAKE OR BUY DECISION**

If no limiting factor is in operation, the decision to buy or to manufacture a product rests on whether the bought-out price of an article is lower than its

marginal cost. The fixed cost is irrelevant for our decision because fixed cost will not change as a result of buying the product/component from outside. If the bought-out price of an article is lower than its marginal cost, it will be profitable to buy the article from outside in all circumstances. The firm will save marginal cost and will spend lower than the marginal cost to buy the article. If the bought-out price is higher than the marginal cost, the total cost of production will increase, if the firm decides to buy the article from outside. Therefore, if it has a choice, it will buy the article for which the difference between the bought-out price and the marginal cost is the lowest among article under consideration. If a limiting factor is in operation, the excess of bought-out price over marginal cost per unit of the limiting factor is to be considered. The article having the lowest excess of bought out price over its marginal cost per unit of the limiting factor will be selected for buying out from outside.

**Following two points should carefully be considered:**

(a) The Marginal Cost of the product; and (b) Whether surplus capacity is available.

Needless to mention here that the decision in such a case is taken after comparing the price which has to be paid and the savings which can also be effected in terms of Marginal Cost, as question of savings usually does not arise in case of fixed cost. In other words, if the marginal costs are lower than the purchase price it may be suggested to produce that article in the factory itself. Moreover, if the surplus capacity is not available and, at the same time, making the parts in the factory involves putting aside other work, the loss on contribution so made must also be considered together with marginal cost. In short, if the purchase price—which are quoted by the outside sellers—is higher than the marginal cost plus a portion of fixed cost plus loss of contribution, the same may be produced by the factor.

**2.15 SELECTION OF MOST PROFITABLE SALES MIX/ PRODUCT-MIX:**

If any firm produces more than one product it may have to decide in what ratio should the products be produced or sold in order to earn maximum profit. However,

the marginal costing techniques help us to a great extent while determining the most profitable product or sales mix. Contribution under various mix will be determined first. Then the product which gives the highest contribution must be given the highest priority, and vice versa. Similarly, any product which gives negative contribution should be discontinued.

**From the following illustration will, however, make the principle clear:**

**2.2 The directors of a company are considering sales budget for the next budget period. From the following information you are required to show clearly to management:**

- (i) The marginal product cost and the contribution per unit;
- (ii) The total contribution resulting from each of following sale mixtures;

	Product A	Product B
	Rs.	Rs.
Direct Material	10	9
Direct Wages	3	2
Selling Price	20	15
Fixed Costs (Total)	Rs. 800	

(Variable Expenses are allotted to products as 100% of direct wages)

**Sales Mixture:**

- (a) 100 units of product A and 200 of B
- (b) 150 units of product A and 150 of B
- (c) 200 units of product A and 100 of B

Recommend which of the sale-mixtures should be adopted.

**Solution :**

(i) Statement showing the Comparative Contribution of the products :

	Product A		Product B	
	Rs.	Rs.	Rs.	Rs.
Selling Price		20		15
Less : Variable Cost				
Direct Mat.	10		9	
Direct Wages	3		2	
Variable Expn.	<u>3</u>		<u>2</u>	
		<u>16</u>		<u>13</u>
Contribution		<u>4</u>		<u>2</u>
∴ $\frac{P}{V}$ Ratio		20%		$13\frac{1}{2}\%$

(ii) From the above Comparative Contribution statement, it becomes clear that as P/V Ratio of Product A is higher in comparison with the Product B, Product A is more profitable one. And, as such, the mixtures which consider the maximum number of Product A would be the most profitable one which is proved from the following table:

Sales Mixture (C) i.e., 200 units of Product A and 100 units of Product B will yield highest contribution.

Product	Contribution per unit	Sales Mixtures					
		Unit	Total	Units	Total	Units	Total
		Rs.	Cost	Rs.	Cost	Rs.	Cost
A	4	100	400	150	600	200	800
B	2	200	400	150	300	100	200
<b>Total</b>		<u>300</u>	<u>800</u>	<u>300</u>	<u>900</u>	<u>300</u>	<u>1,000</u>

## 2.16 NUMERICAL PROBLEMS ON COST- VOLUME –PROFIT ANALYSIS

2.3. Indian Traders and Indian Corporation sell the same type of products in same type of market. Their budgeted profit and loss account for the ending 2003 are as follows:

	Indian Traders		Indian Corporation	
	Rs.	Rs.	Rs.	Rs.
Sales		300000		300000
Variable cost	240000		200000	
Fixed costs	30000	(270000)	70000	(270000)
Net Profit		30000		30000

You are required to:

a) Calculated the break-even points of each business; b) Calculated the sales-volume at which each of the business will earn Rs. 10000 profit; and state which business is likely to earn greater profit in condition of: Heavy demand for the profit; and Low demand for the product. Give your reasons.

**Solution:**

(a) Break-even point

	Indian Traders	Indian Corporation
	(Rs.)	(Rs.)
Sales	300000	300000
Variable cost	(240000)	(200000)
Contribution	60000	100000
C/S ratio=	$60000 \times 100/300000 = 20\%$	$100000 \times 100/300000 = 33.33\%$
Break-even point	$\frac{\text{Rs. } 30000}{20\%} = \text{Rs. } 150000$	$\frac{\text{Rs. } 70000}{33\%} = \text{Rs. } 21000$

(b) Total contribution required:

Fixed costs	30000	70000
Profit required	10000	10000
	40000	80000
	Rs. 40000/20%	Rs. 80000/33.33%
	= Rs. 200000	= Rs. 240000

(c) Sales-volume at which both the firms would earn equal profit: Let the sales volume be 'a'

$$\text{Profit of Indian Traders: } a \times 20\% - \text{Rs. } 30000 = 0.20a - 30000$$

Profit for Indian Corporation:  $a \times 33\frac{1}{3}\% - \text{Rs. } 70000$  The profit for both the firms being equal,

$$0.20a - a/3 - \text{Rs. } 30000 + \text{Rs. } 70000 = 0 \text{ or } a = \text{Rs. } 300000$$

The C/S ratio of Indian Corporation at 33.33% is higher than that of Indian Traders at 20%. Therefore, Indian Corporation will earn a higher profit if the sales

volume exceeds Rs. 300000 level. However, below that level profit for Indian Traders will be higher. It may be concluded that Indian Corporation is likely to earn a higher profit under conditions of heavy demand for the product. Similarly, Indian Traders is likely to earn a higher profit under conditions of low demand for the product.

**2.4 .** PNG electric company manufactures a number of electric products. Rechargeable light is one of the PNG's products that sells for \$180/unit. Total fixed expenses related to rechargeable electric light are \$270,000 per month and variable expenses involved in manufacturing this product are \$126 per unit. Monthly sales are 8,000 rechargeable lights.

**Required:**

1. Compute break-even point of the company in dollars and units.
2. According to a research conducted by sales department, a 10% reduction in sales price will result in 25% increase in unit sale. Prepare two income statements in contribution margin format, one using the current price and one using proposed price (10% below the old sales price).
3. Compute the number of rechargeable lights to be sold to earn a net operating income of \$189,000 per month (use original data).

**Solution:**

**(1) Computation of break-even point:**

a. Break even point in units:

Break even point in units can be computed by using either equation method or contribution margin method. Both the methods are given below:

*Equation method:*

Sales = Variable expenses + Fixed expenses

$\$180Q = \$126Q + 270,000$

$\$180Q - \$126Q = \$270,000$

$$\$54Q = \$270,000$$

$$Q = \$270,000/\$54$$

$$Q = 5,000 \text{ Units}$$

*Contribution margin method:*

Break even point = Fixed expenses/Contribution margin per unit

$$270,000 / 54^*$$

$$= 5,000 \text{ units}$$

$$*\$180 - \$126$$

**b. Break-even point in dollars:**

Break-even point in dollars can be computed by multiplying break-even point in units by sales price per unit as shown below:

$$5,000 \text{ units} \times \$180$$

$$=\$900,000$$

**(2) Income statements:**

**a. Income statement under current operations :**

	<b>Total</b>	<b>Per Unit</b>
Sales (8,000 lights)	\$ 4,40,000	\$ 180
Less variable expenses	8,000	126
	_____	_____
Contribution margin	432,000	\$ 54
Less fixed expenses	270,000	
	_____	
Net operating income	\$ 162,000	
	_____	



**b. Income statement under proposed operations:**

	<b>Total</b>	<b>Per Unit</b>
Sales (10,000 lights)	\$ 6,20,000	\$ 162
Less variable expenses	2,60,000	126
	<hr/>	<hr/>
Contribution margin	360,000	\$ 36
Less fixed expenses	270,000	
	<hr/>	
Net operating income	<u>\$ 90,000</u>	

The proposal should not be accepted because it will reduce the contribution margin from \$54 per unit to \$36 per unit and net operating income from \$162,000 to \$90,000.

**(3) Target profit analysis:**

**a. Equation method:**

Sales = Variable expenses + Fixed expenses + Profit

$$\$180Q = \$126Q + 270,000 + \$189,000$$

$$\$180Q - \$126Q = \$459,000$$

$$\$54Q = \$459,000$$

$$Q = \$459,000 / \$54$$

$$Q = 8,500 \text{ Units}$$

**b. Contribution margin method:**

(Fixed expenses + Target income)/Contribution margin per unit

$$= (\$270,000 + \$189,000) / 54$$

$$= 8,500 \text{ units}$$

On the basis of original data, company needs to sell 8,500 rechargeable lights to earn a profit of \$189,000

**2.5 PQR company sells two products – product A and product B. The total fixed expenses of the company are \$1,197,000. The monthly data of PQR is as follows:**

**Product A:**

- Sales: \$1,400,000
- Contribution margin ratio: 60%

**Product B:**

- Sales: \$600,000
- Contribution margin ratio: 70%

**Required:**

1. Prepare contribution margin income statement for the company.
2. Calculate break-even point in dollars.

**Solution:**

**(1) Income statement:**

	Product A		Product B		Total	
	Amount	Perc.	Amount	Perc.	Amount	Perc.
Sales	\$ 14,00,00	100%	\$ 600,000	100%	\$ 2,00,000	100%
Less variable expenses	5,60,000	40%	180,000	30%	7,40,000	37%
	\$ 840,000	60%	\$ 420,000	70%	\$ 1,260,000	63%
Less fixed expenses					1,197,000	
Net operating income					\$ 63,000	

**(2) Computation of break-even point:**

The PQR company sells two products. Its break-even point can be easily computed by dividing the total fixed expenses by overall contribution margin ratio (CM ratio).

Fixed expenses/Overall CM ratio

= 1,197,000/.63

= \$1,900,000

**2.6 Aladin company manufactures small battery that is used in clocks, toys and some other electronic devices. The last month's income statement of Aladin is given below :**

	<b>Total</b>	<b>Per unit</b>
Sales (30,000 lights)	\$ 300,000	\$ 10
Less variable expenses	1,80,000	6
	<hr/>	<hr/>
Contribution margin	120,000	\$ 4
Less fixed expenses	100,000	
	<hr/>	
Net operating income	\$ 20,000	

**Required:**

Prepare Aladin's new income statement under each of the following conditions:

1. The sales volume increases by 15%.
2. The selling price decreases by 20% per unit, and the sales volume increases by 30%.
3. The selling price increases by 50% per unit, fixed expenses increase by \$20,000 and the sales volume decreases by 5%.
4. Variable expenses increase by 20% per unit, the selling price increases by 12%, and the sales volume decreases by 10%.

**Solution:**

**(1). Sales volume (number of units sold) increases by 15%:**

	<b>Total</b>	<b>Per unit</b>
Sales (34,500 lights)	\$ 3,45,000	\$ 10
Less variable expenses	2,07,000	6

Contribution margin	1,38,000	\$ 4
Less fixed expenses	1,00,000	
Net operating income	<u>\$ 38,000</u>	

**(2). Selling price decreases by 10% and the sales volume increases by 30%:**

	<b>Total</b>	<b>Per unit</b>
Sales (39,000 lights)	\$ 3,12,000	\$ 8
Less variable expenses	2,34,000	6
Contribution margin	<u>78,000</u>	<u>\$ 2</u>
Less fixed expenses	1,00,000	
Net operating income	<u>\$ 22,000</u>	

**(3). Selling price increases by 50%, fixed expenses increase by \$20,000 and the sales volume decreases by 5%:**

	<b>Total</b>	<b>Per unit</b>
Sales (28,500 lights)	\$ 4,27,500	\$ 15
Less variable expenses	1,71,000	6
Contribution margin	<u>256,500</u>	<u>\$ 9</u>
Less fixed expenses	120,000	
Net operating income	<u>\$ 1,36,500</u>	

**(4). Variable expenses increase by 20% per unit, the selling price increases by 12%, and the sales volume decreases by 10%.**

	<b>Total</b>	<b>Per unit</b>
Sales (27,000 lights)	\$ 302,500	\$ 11.20
Less variable expenses	<u>194,400</u>	<u>7.20</u>

Contribution margin	108,000	\$ 4.00
Less fixed expenses	100,000	
Net operating income	\$ 8,000	

**2.7 Following is the contribution margin income statement of a single product company:**

	<b>Total</b>	<b>Per unit</b>
Sales	\$ 1,200,000	\$ 80
Less variable expenses	840,000	56
Contribution margin	360,000	\$ 24
Less fixed expenses	300,000	
Net operating income	\$ 60,000	

**Required:**

1. Calculate break-even point in units and dollars.
2. What is the contribution margin at break-even point?
3. Compute the number of units to be sold to earn a profit of \$36,000.
4. Compute the margin of safety using original data.
5. Compute CM ratio. Compute the expected increase in monthly net operating if sales increase by \$160,000 and fixed expenses do not change.

**Solution:**

**(1) Break-even point in units and dollars:**

Fixed expenses/Unit contribution margin

\$300,000/\$24

12,500 units

or

$$(12,500 \text{ units} \times \$80) = \$1,000,000$$

**(2) Contribution margin at break-even point:**

Contribution margin must be \$300,000 at break-even point because it will cover fixed costs and nothing will remain to go towards profit.

**(3) Computation of target profit:**

(Fixed expenses + Target profit)/Unit contribution margin

$$(\$300,000 + \$36,000)/\$24$$

Company must sell 14,000 units of product to earn a target profit of \$36,000.

**(4) Margin of safety in dollars and percentage:**

Margin of safety in dollars = Actual or budgeted sales – sales required to break-even

$$\$1,200,000 - \$1,000,000$$

$$\$200,000$$

or

Margin of safety in percentage = Margin of safety in dollars/Actual or budgeted sales

$$= \$200,000/\$1,200,000$$

$$=0.1667 \text{ or } 16.67\%$$

**(5) CM ratio and expected change in net operating income:**

Contribution margin/Total sales

$$= \$360,000/\$1,200,000$$

$$= 0.30 \text{ or } 30\%$$

If the sales are increased by \$160,000 without any change in fixed expenses, the net operating income will be increased by \$48,000 as computed below:

$$\text{\$160,000} \times \text{CM ratio}$$

$$\text{\$160,000} \times 0.3$$

$$= \text{\$48,000}$$

**2.8** A store sells t-shirts. The average selling price is Rs. 15 and the average variable cost (cost price) is Rs. 9. Thus, every time the store sells a shirt it has Rs. 6 remaining after it pays the manufacturer. This Rs. 6 is referred to as the unit contribution.

(a) Suppose the fixed costs of operating the store (its operating **expenses**) are Rs. 1,00,000 per year. Find Break-even in units ?

$$\text{Solution : Breakeven in units} = \frac{\text{Total Fixed Cost}}{\text{Price} - \text{Variable Cost}}$$

$$\text{Breakeven in units} = \frac{1,00,000}{15 - 9}$$

**Answer : Break-Even in Units = 16,667 T-shirts**

(b) If the owner desired a profit of Rs. 25,000, what will be break-even point in Rupees ?

$$\text{Solution : Target Sales (in Rupee)} = \frac{\text{Total Fixed Costs} + \text{Target Profit}}{\text{Contribution Margin Ratio}}$$

$$\text{Target Sales (in Rupee)} = \frac{1,00,000 + 25,000}{1 - (9/15)}$$

**Answer : Break- Even in Rupees = 16,667**

(c) If fixed costs rose to Rs. 1,10,000, break-even in units volume would be ?

$$\text{Solution : Breakeven in units} = \frac{\text{Total Fixed Cost}}{\text{Price} - \text{Variable Cost}}$$

$$\text{Breakeven in units} = \frac{1,10,000}{15-9}$$

**Answer : Break-Even in Units = 18,333 T-shirts**

(d) If the average selling price rose to Rs. 16, break even volume would fall ?

**Solution :** Breakeven in units =  $\frac{\text{Total Fixed Cost}}{\text{Price} - \text{Variable Cost}}$

$$\text{Breakeven in units} = \frac{1,00,000}{16-9}$$

**Answer : Break-Even in Units = 14,286 T-shirts**

**2.9** Let's use Whittier Company, a manufacturer of mulching lawn mowers, as an example. Illustrates how to calculate the variable and fixed expenses and prepare the contribution margin statement for Whittier.

**Information :**

Whittier Company plans to sell 1,000 mowers at \$400 each in the coming year. Product costs include :

Direct materials per mower	\$	180
Direct labor per mower		100
Variable factory overhead per mower		25
Total fixed factory overhead		15,000

Variable selling expense is a commission of \$20 per mower; fixed selling and administrative expense totals \$30,000.

**Required :**

1. Calculate the total variable expense per unit.
2. Calculate the total fixed expense for the year.
3. Prepare a contribution margin income statement for Whittier for the coming year.



**Solution :**

1. Total variable expense per unit

$$\begin{aligned} &= \text{Direct materials} + \text{Direct labor} + \text{Variable factory overhead} + \text{Variable selling expense} \\ &= \$180 + \$100 + \$25 + \$20 \\ &= \$325 \end{aligned}$$

2. Total fixed expense = Fixed factory overhead

+ Fixed selling and administrative expense

$$= \$ 15,000 + \$ 30,000 = \$ 45,000$$

3. **Whittier company**

**Contribution Margin Income Statement**

**For the Coming Year**

	<b>Total</b>	<b>Per Unit</b>
Sales (\$400 × 1,000 mowers)	\$400,000	\$400
Total variable expense (\$325 × 1,000)	<u>325,000</u>	<u>325</u>
Total contribution margin	\$75,000	<u>\$75</u>
Total fixed expense	45,000	
Operating income	<u>\$30,000</u>	

**2.17 SUMMARY**

Cost-volume-profit (CVP) analysis is the study of the effect on future profit of changes in fixed cost, variable cost, selling price, sales quantity and sales mix. CVP analysis assumes that the cost structure and the relationships between fixed costs, variable cost and selling price will remain valid during the period under consideration. Therefore, the analysis produces useful results for decisions within the 'relevant range' and the '**relevant period**'. Moreover, there are certain simplistic assumptions underlying the CVP analysis which limit the precision and reliability of the result of the analysis. CVP analysis uses a simple equation, which captures the relationships between different variables. Graphical methods are also used for the study. A break-even chart represents the relationships between different variables. Managers

use different variations of the simple breakeven chart.

In this chapter, we have discussed the use of cost information for tactical decisions. Tactical decisions are short-term decisions that aim at maximizing operating profit, with available facilities. Therefore, usually such decisions take into consideration marginal costs only. However, sometimes short-term decision influence fixed costs, e.g. additional advertising expenses. Thus, incremental fixed expenses cannot be ignored. Marginal costing technique is used to determine optimal product-mix. A firm maximizes operating profit by producing products, which contribute highest towards fixed costs and profit. Therefore, contribution per unit of the limiting factor is used as profitability index. The limiting factor is the scarce resource or any other factor, which restricts the activity level. Often other restrictive conditions determine the optimal product-mix. Marginal costing technique is used to decide whether a component is to be manufactured or to be purchased from outside. If spare capacity is available, the product should be manufactured only if variable-manufacturing cost is lower than purchase price. If spare capacity is not available, manufacturing decision results in the discontinuance of another product. Therefore, loss of contribution due to discontinuance should be added to the costs of manufacturing and the total should be compared with the purchase price. If the firm has no choice but to purchase some components from outside, it decides in favour of the component, manufacturing of which generates savings lowest among the alternative products. For short-term decisions on methods of manufacturing or temporary shut down of plant/ business, managers use marginal costing technique-considerations are similar to those discussed above.

## 2.18 GLOSSARY:

**Marginal cost:** The cost added by producing one additional unit of a product or service.

**Marginal costing:** Marginal costing are the variable costs consisting of labor and material costs, plus an estimated portion of fixed costs such as administration overheads and selling expenses.

**Break even point:** The break even point is the production level where total revenues equals total expenses. In other words, the break-even point is where a

company produces the same amount of revenues as expenses either during a manufacturing process or an accounting period.

**Cost-volume-profit (CVP) analysis:** It is used to determine how changes in costs and volume affect a company's operating income and net income.

## 2.19 SELF ASSESSMENT QUESTIONS

1. Define 'marginal costing'. How are variable costs and fixed costs treated in marginal costing? Give a journal entry for overhead accounts under marginal costing.
2. What are the important areas of management decisions opened up by the application of marginal costing technique? Answer briefly and to the point.
3. Explain CVP analysis and Break-even-point analysis.
4. Discuss the merits and demerits of marginal costing.
5. How marginal costing is different from absorption costing.
6. "Cost-volume profit analysis is a very useful technique to management for cost control, profit planning and decision making." Explain.
7. What is product mix? Is suitable product mix necessary to maximise the profits of a company?
8. What are the factors taken into consideration while deciding whether to make or buy?
9. What is meant by "Angle of incidence" and "Margin of safety" in a break even chart? Illustrate graphically and explain their significance.
10. "Changes in fixed cost are more significant to a company than changes in variable costs". Discuss
11. Discuss the importance and application of marginal costing in the present economic scenario of India.
12. "The technique of marginal costing can be a valuable aid to management."

Explain the statement with the help of examples.

13. The National Company has just been formed. They have a patented process which will make them the sole suppliers of Product A. During the first year the capacity of their plant will be 9000 units and this is the amount they will be able to sell. Their costs are :

Direct labour ₹ 15 per unit; Rad materials ₹ 5 per unit ; Other variable costs ₹ 10 per unit; Fixed costs ₹ 2,40,0000.

- (a) If the company wishes to make a profit of ₹ 2,10,000 during the first year, what should the selling price be ? What is the contribution margin at this price ?
- (b) If at the end of the first year, they wish to increase their volume and an increase of ₹ 1,00,000 in the annual fixed costs will increase their capacity to 50,000 units, how many units will they have to sell to realise a profit of ₹ 7,60,000, if their new selling price ₹ 70 per unit and no other costs change, except that they invest ₹ 5,00,000 in advertising with a view to achieve this end ?

## 2.20 SUGGESTED READINGS

1. Ashish K. Bhattacharya, Principles and Practices of Cost Accounting (3<sup>rd</sup>), New Delhi: Prentice Hall of India Private Limited, 2004.
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4. John G. Blocker and Wettmer W. Keith, Cost Accounting, New Delhi: Tata McGraw Publishing Co. Ltd., 1976.
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## **ACCOUNTING FOR VARIANCE**

### **STRUCTURE**

- 3.1 Introduction
- 3.2 Objective
- 3.3 Meaning of Standard Cost And Standard Costing
- 3.4 Steps involved in Standard Costing
- 3.5 Standard Costing Vs. Budgetary Control
- 3.6 Standard Costs and Estimated Costs
- 3.7 Preliminaries for Establishing Standard Costing System
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#### Analysis of Variances

- 3.10 Calculation of material variance
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### **3.1 INTRODUCTION**

The basic function of management accounting is to facilitate the managerial control in a business unit or organisation. Management control is the process of evaluating performance and applying corrected measures, if required, so that performance takes place according to plans. The major aspect of managerial control is cost control. And the 'Standard Costing' is that technique which helps management to control costs and business operations. It aims at eliminating wastes and increasing efficiency in performance through setting up standards or formulating different cost plans.

### **3.2 OBJECTIVE:**

1. To explain the various facts of a standard costing system.
2. To calculation of variances.

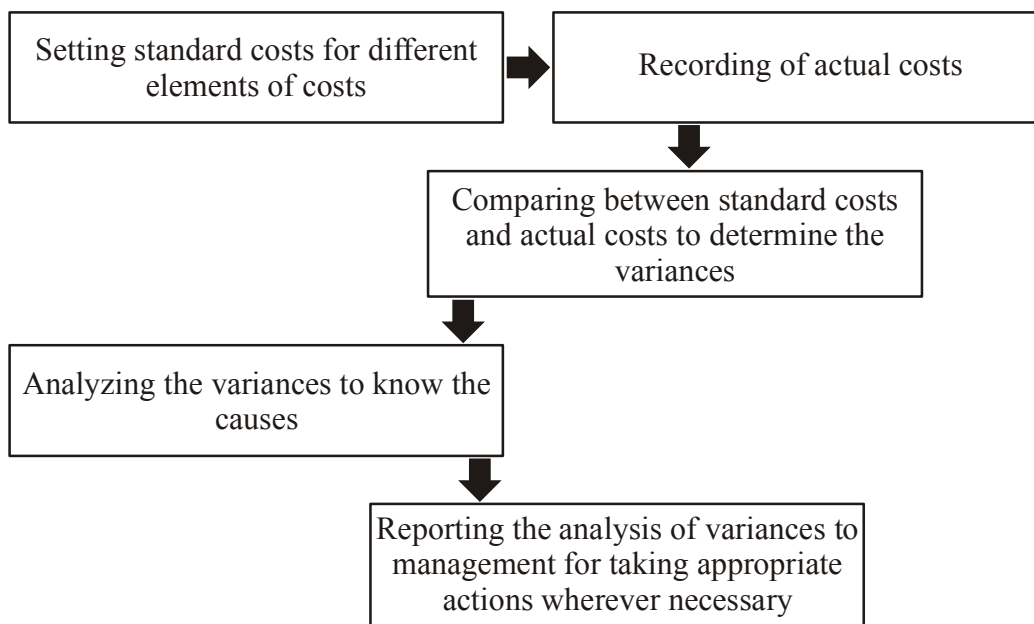
### **3.3 MEANING OF STANDARD COST AND STANDARD COSTING**

The word 'standard' means a benchmark or gauge. The 'standard cost' is a predetermined cost which determines in advance what each product or service should cost under given circumstances. Backer and Jacobsen define "Standard cost is the amount the firm thinks a product or the operation of a process for a period of time should cost, based upon certain assumed conditions of efficiency, economic conditions and other factors". Chartered Institute of Management Accountants, London defines standard cost as "a predetermined cost which is calculated from management's standards of efficient operation and the relevant necessary expenditure". They are the predetermined costs based on technical estimate of material, labour and overhead for a selected period of time and for a prescribed set of working conditions. The technique of using standard costs for the purposes of cost control is known as standard costing. Brown and Howard define "standard costing is a technique of cost accounting which compares the standard cost of each product or service with actual cost to determine the efficiency of the operation so that any remedial action may be taken immediately". The terminology of Cost Accountancy defines standard costing as "the preparation and use of standard costs, their comparison with actual costs, and the analysis of variance to their

causes, and points of incidence”. The London Institute of Cost and Works Accountants define it as “An estimate cost, prepared in advance of production or supply correlating a technical specification of material and labour to the price and wage rates estimated for a selected period of time, with an addition of the apportionment of overheads expenses estimated for the same period within a prescribed set of working conditions”. Further, it is a system of cost accounting, which is designed to find out how much should be the cost of a product under the existing conditions. The actual cost can be ascertained only when production is undertaken. The predetermined cost is compared to the actual cost and a variance between the two enables the management to take necessary corrective measures.

### 3.4 STEPS INVOLVED IN STANDARD COSTING

#### STANDARD COSTING INVOLVES THE FOLLOWING STEPS:



The technique of standard costing involves the determination of cost before occurring. The standard cost is based on technical information after considering the impact of current conditions. With the change in condition, the cost also can be modified so as to make it more realistic. The standard cost is divided into standards for materials, labour and overheads. The actual cost is recorded when

incurred. The standard cost is compared to the actual cost. The difference between the two costs is known as variance. The variances are calculated element wise. The management can take corrective measures to set the things right on the basis of different variances.

The basic purpose of standard costing is to determine efficiency or inefficiency in manufacturing a particular product. This will be possible only if both standard costs and actual costs are given side by side. Though standard costing system will be useful for all types of commercial and industrial undertakings but it will be more useful in those undertakings where production is standardized. It will be of less use in job costing system because every job has different specifications and it will be difficult to determine standard costs for every job.

### **3.5 STANDARD COSTING Vs. BUDGETARY CONTROL**

In budgetary control, budgets are used as a means of planning and control. The targets of various segments are set in advance and actual performance is compared with predetermined objects. In this way management can assess the performance of different departments. On the other hand, standard costing also set standards and enables to determine efficiency on the basis of standards and actual performance.

Budgetary control is essential to determine standard costs, whereas, the standard costing system is necessary for planning budgets. In budgetary control the budgets are prepared for the concern as a whole whereas in standard costing the standards are set for producing a product or for providing a service. In standard costing, unit concept is used while in budgetary control total concept is used. The budgets are fixed on the basis of past records and future expectations. Standard costs are fixed on the basis of technical information. Standard costs are planned costs and these are expected in future. As far as scope is concerned, in case of budgetary control it is much wider than standard costing. Budgets are prepared for incomes, expenditures and other functions of the departments such as purchase, sale, production, finance and personnel department. In contrary, standards are set up for expenditures only and, therefore, for manufacturing departments standards are set for different elements of cost i.e., material, labour and overheads.



Further, in budgetary control, the targets of expenditure are set and these targets cannot be exceeded. In this system the emphasis is on keeping the expenditures within the budgeted figures. In standard costing the standards are set and an attempt is made to achieve these standards. The emphasis is on achieving the standards. Actual costs may be more than the standard costs and there can be no such thing in budgetary control. The budgetary control system can be applied partly or wholly. Budgets may be prepared for some departments and may not be prepared for all the departments. If a concern is interested in preparing production budget only, it is free to do so. Standard costing cannot be used partially; it will have to be used wholly. The standards will have to be set for all elements of cost. In fact, the systems operate in two different fields and both are complimentary in nature.

### **3.6 DIFFERENCE BETWEEN STANDARD COSTING AND ESTIMATED COST**

The standard costs and estimated costs both are used to determine price in advance. The purpose of both of them is to control cost. They follow the same accounting principles. Despite similarities, they differ in terms of objects and purpose. Estimated costs are based on historical accounting. It is an estimate of what the cost will be. It is a cost of guesswork or reasonable estimate for the costs in future. On the other hand standard costs are based on scientific analysis and engineering studies. Standard costing determines what the cost should be. Standard costs are used as a device for measuring efficiency. The standards are predetermined and a comparison of standards with actual costs enables to determine the efficiency of the concern. Estimated costs cannot be used to determine efficiency. It only determines the expected costs. An effort is made that estimated cost should almost be near to actual costs. The purpose of determining estimated costs is to find out selling price in advance to take a decision whether to produce or to make and also to prepare financial budgets. Estimated costs do not serve the purpose of cost control. On the other hand standard costs are helpful in cost control. The analysis of variance enables to take corrective measures, if necessary. Standard costs are not easily changed. The standards are set in such a way that small changes in conditions do not require a change in standards. Estimated costs are revised with

the change in conditions. They are made more realistic by incorporating changes in prices. Standard costs are more static than estimated costs. Estimated costs are used by the concern using historical costing. Standard costing is used by those concerns which use standard costing system. Standard costing is a part of cost accounting process while estimated costs are statistical in nature and as such they may not become a part of accounting.

#### **Estimated Cost Vs. Standard Cost**

- Estimated cost can be used in any business which is running under historical costing system.
- Computation of estimated costs may be made at any time for any specific purpose and may reflect approximation.
- Primary emphasis is on ascertainment of costs which depend on expected actuals of average of past performance.
- Estimated costs can be ascertained for a part of the business also for a particular purpose.
- Standard cost can be applied in a business operating under the standard costing system.
- Calculation on scientific basis is to be made for arriving at standard costs.
- Cost control is the main aspect involved under this system. Standard costs serve as yardsticks for performance measurement.
- Standard costs are to be fixed in respect of every element of cost and, therefore, it incorporates the whole of the manufacturing process.

### **3.7 PRELIMINARIES FOR ESTABLISHING STANDARD COSTING SYSTEM**

The establishment of a standard costing system involves the following steps:

1. **Determination of Cost Centre:** A cost centre may be a department or part of a department or item of equipment or machinery or a person or a group of persons in respect of which costs are accumulated and one where control can be exercised. Cost centres are necessary for determining the costs.

- 2. Classification of Accounts:** Classification of accounts is necessary to meet a required purpose i.e., function, asset or revenue item. Codes can be used to have a speedy collection of accounts. A standard is a predetermined measure of material, labour and overheads. It may be expressed in quantity and its monetary measurements in standard costs.
- 3. Types of Standards:** The standards are classified into three categories:
- (i) **Current Standard.** A current standard is a standard which is established for use over a short period of time and is related to current conditions. It reflects the performance which should be accomplished during the current period. The period for current standard is normally one year. It is supposed that the conditions of production will remain unchanged. In case there is any change in price or manufacturing condition, the standards are also revised. Current standard may be ideal standard and expected standard.
  - (a) **Ideal Standard.** The ideal standard represents a high level of efficiency. It is fixed on the assumption that favourable conditions will prevail and management will be at its best. The price paid for materials will be lowest and wastages cost of labour and overhead expenses will be minimum possible.
  - (b) **Expected Standard.** This standard is based on expected conditions. It is the target which can be achieved if expected conditions prevail. All existing facilities and expected changes are taken into consideration while fixing these standards. An allowance is given for human error and normal deficiencies. It is realistic and attainable and it is used for fixing efficiency standard.
  - (c) **Basic Standard:** A basic standard is established for use for an indefinite period or a long period. These standards are revised only on the changes in specification of material and technology production.
  - (d) **Normal Standard:** Normal standard is a standard which is anticipated can be attained over a future period of time, preferably long enough

to cover one trade cycle. This standard is based on the conditions which will cover a future period, say 5 years, concerning one trade cycle. If a normal cycle of ups and downs in sales and production is 10 years then standard will be set on average sales and production which will cover all the years.

- 4. Organisation for Standard Costing:** In a business concern a standard costing committee is formed for the purpose of setting standards. The committee includes production manager, purchase manager, sales manager, personnel manager, chief engineer and cost accountant. The Cost Accountant acts as a coordinator of this committee. He supplies all information for determining the standard and later on coordinates the costs of different departments. He also informs the committee about the change in price level, etc. The committee may revise the standards in the light of the changed circumstances.
- 5. Setting of Standards:** The standard for direct material, direct labour and overhead expenses are fixed. The standards for direct material, direct labour and overheads should be set up in a systematic way so that they can be used as a tool for cost control easily.

### **3.8 MERITS OF STANDARD COSTING**

Standard costing is not only helpful for cost control purposes but it is also useful in production planning and policy formulation. It derives following advantages:

- 1. Measurement of Efficiency:** It is a tool for assessing the efficiency after comparing the actual costs with standard costs to enable the management to evaluate performance of various cost centres. By comparing actual costs with standard costs variances are determined and management is able to identify the place of inefficiencies. It can fix responsibility for deviation in performance. A regular check on various expenditures is also ensured by standard costing system. The standards are being constantly analyzed and an effort is made to improve efficiency. Whenever a variance occurs the reasons are studied and immediate corrective measures are undertaken.

**2. Production and Price Policy Formulation:** It becomes easy to formulate production plans by taking into account standard costs. It is also supportive for finding prices of various products. In case, tenders are to be submitted or prices are to be quoted in advance then standard costing produces necessary data for price fixation.

**3. Reduction of Work:** In this system, management is supplied with useful information and necessary information is recorded and redundant data are avoided. The report presentation is simplified and only required information is presented in such a form that management is able to interpret the information easily and usefully. Therefore, standard costing reduces clerical work to a considerable extent

**4. Management by Exception:** Management by exception means that everybody is given a target to be achieved and management need not supervise each and everything. The responsibilities are fixed and everybody tries to achieve his targets. If the things are going as per targets then the management needs not to bother. Management devotes its time to other important things. So, management by exception is possible only when targets of work can be fixed. Standard costing enables the determination of targets.

### **3.9 DE- MERITS OF STANDARD COSTING**

Besides all the above benefits derived from this system, it has a number of limitations, which are discussed as follows:

Standard costing cannot be used in those concerns where non-standard products are produced.

1. The time and motion study is required to be undertaken for the process of setting up standards. These studies require a lot of time and money. Further, the process of setting up standards is a difficult task, as it requires technical skill.
2. There are no inset circumstances to be considered for fixing standards. With the change in circumstances the standards are also to be revised. The revision of standard is a costly process.

3. This system is expensive and small concerns may not afford to bear the cost. For small concerns the utility from this system may be less than the cost involved in it.
4. The fixing of responsibility is not an easy task. The variances are to be classified into controllable and uncontrollable variances. The responsibility can be fixed only for controllable variances not in the case of uncontrollable.
5. The industries liable for frequent technological changes will not be suitable for standard costing system. The change in production process will require a revision of standard. A frequent revision of standard will be costly. So this system will not be useful for industries where methods and techniques of production are fast changing.

## **ANALYSIS OF VARIANCES**

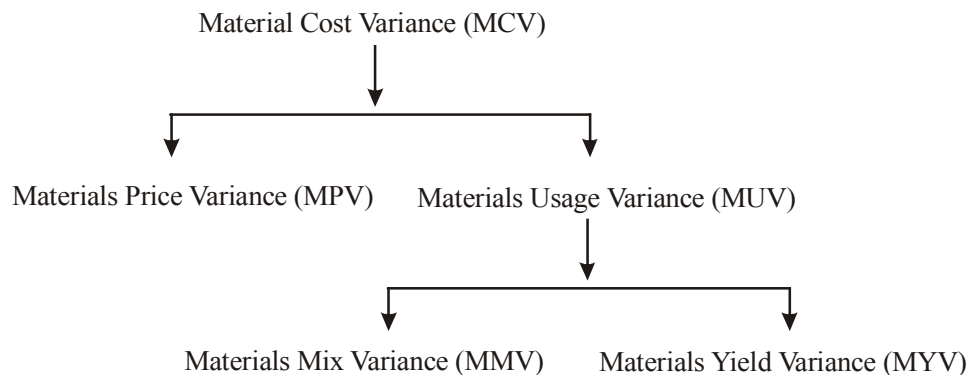
The divergence between standard costs, profits or sales and actual costs, profits or sales respectively will be known as variances. The variances may be favourable and unfavourable. If actual cost is less than the standard cost and actual profit and sales are more than the standard profits and sales, the variances will be favourable. On the contrary if actual cost is more than the standard cost and actual profit and sales are less than the standard profits and sales, the variances will be unfavourable. The variances are related to efficiency. If variances are favourable, it will show efficiency and if variances are unfavourable it will show inefficiency. The variances may be classified into four categories such as Direct Materials Variances, Direct Labour Variances, Overheads Cost Variances and Sales or Profit Variances.

### **3.10 CALCULATION OF MATERIAL VARIANCES**

Direct material variances are also known as material cost variances. The material cost variance is the difference between the standard cost of materials that should have been incurred for manufacturing the actual output and the cost of materials that has been actually incurred. Material Cost Variance comprises of: (i) Material Price Variance and (ii) Material Usage Variance: Material usage variance may further be subdivided into material Mix Variance and Material Yield Variance.

The Chart 7.1 depicts the divisions and subdivisions of material variances.

**Chart 3.1**



The following equations may be used for verification of material cost variances.

(i)  $MCV = MPV + MUV$  or  $MPV + MMV + MYV$

(ii)  $MUV = MMV + MYV$

- (a) Materials Cost Variance:** Material cost variance is the difference between standard materials cost and actual materials cost. Material cost variance arises due to change in price of materials and variations in use of quantity of materials. Material cost variance is ascertained as such:

Materials Cost Variance = Standard Material Cost – Actual Material Cost  
Standard Material Cost = Standard Price per unit x Standard Quantity of materials

Actual Material Cost = Actual price per unit x Actual quantity of materials.

If the standard cost is more than the actual cost, the variance will be favourable and on the other hand, if the actual cost is more than the standard cost, the variance will be unfavourable or adverse.

- (b) Materials Price Variance:** Materials price variance arises due to the standard price specified and actual price paid. It may also arise due to: (i)

Changes in basic prices of materials, (ii) failure to purchase the quantities anticipated at the time when standards were set, (iii) failure to secure discount on purchases, (iv) failure to make bulk purchases and incurring more on freight, etc., (v) failure to purchase materials at proper time, and (vi) Not taking cash discount when setting standards.

Materials Price Variance= Actual Quantity (Standard price–Actual price)

In this case actual quantity of materials used is taken. The price of materials is taken per unit. If the answer is in plus, the variance will be favourable and it will be unfavourable if the result is in negative.

- (c) **Material Usage Variance.** Material usage (or quantity) variance arises due to the difference in standard quantity specified and actual quantity of materials used. This variance may also arise due to: (i) Negligence in use of materials, (ii) More wastage of materials by untrained workers or defective methods of production, (iii) Loss due to pilferage, (iv) Use of material mix other than the standard mix, (v) More or less yield from materials than the standard set, and (vi) Defective production necessitating the use of additional materials.

Materials usage variance= Standard Price (Standard Quantity – Actual Quantity)

The quantities of material specified and actually used are taken and standard price per unit is used. If the answer from the above mentioned formula is in plus, the variance will be a favourable variance but if the answer is in minus the variance will be unfavourable or adverse.

**Example 3.1:** Following is the data of a manufacturing concern. From the figures given below, calculate (i) Materials Cost Variance, (ii) Material Price Variance, and (iii) Material Usage Variance. The standard quantity of materials required for producing one ton of output is 40 units. The standard price per unit of materials is 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 was spent on purchasing the materials.



**Solution:**

Standard quantity of material (SQ) = (90 x 40) = 3600 units

Standard price per unit = Rs. 3

Actual price per unit = 14000/4000 = Rs. 3.50

**(i) Material Cost Variance** = Standard material cost – Actual material cost  
Standard material cost = Standard quantity x Standard price (3,600 x 3 = Rs. 10,800)

$$= 10,800 - 14,000$$

$$= (-) \text{ Rs. } 3,200 \text{ Adverse}$$

**(ii) Material Price Variance** = Actual Quantity (Standard price per unit – Actual price per unit)

$$= 4,000 (3.00 - 3.50)$$

$$= 4,000 (-0.50)$$

$$= (-) \text{ Rs. } 2,000 \text{ Adverse}$$

**(iii) Material Usage Variance** = Standard Price per unit (SQ – AQ)

$$= 3 (3,600 - 4,000)$$

$$= 3 (-400) = (-) \text{ Rs. } 1,200 \text{ Adverse}$$

**Verification:**

$$\text{MCV} = \text{MPV} + \text{MUV}$$

$$- 3,200 = - 2,000 - 1,200$$

$$- 3,200 = - 3,200$$

**Example 3.2:** From the data given below, calculate: (i) Material Cost Variance, (ii) Material Price Variance, and (iii) Material Usage Variance.

Product	Standard Quantity (Units)	Standard Price Rs.	Actual Quantity (Units)	Actual Price Rs.
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

**Solution:**

**(i) Material Cost Variance** = Standard Cost – Actual Cost Or (SQ x Std. Rate) – (AQ. x Actual Rate)

$$\begin{aligned} \text{Material A} &= (1,050 \times 2) - (1,100 \times 2.25) \\ &= 2,100 - 2,475 = - \text{Rs. } 375 \end{aligned}$$

$$\begin{aligned} \text{Material B} &= (1,500 \times 3.25) - (1,400 \times 3.50) \\ &= 4,875 - 4,900 = - \text{Rs. } 25 \end{aligned}$$

$$\begin{aligned} \text{Material C} &= (2,100 \times 3.50) - (2,000 \times 3.75) \\ &= 7,350 - 7,500 = - \text{Rs. } 150 \end{aligned}$$

Material Cost Variance = Rs. 550 Unfavourable

**(ii) Material Price Variance** = Actual Quantity (Standard Price – Actual Price)

$$\begin{aligned} \text{Material A} &= 1,100 (2.00 - 2.25) \\ &= 1,100 (-0.25) = \text{Rs. } 275 \end{aligned}$$

$$\begin{aligned} \text{Material B} &= 1,400 (3.25 - 3.50) \\ &= 1,400 (-0.25) = - \text{Rs. } 350 \end{aligned}$$

$$\begin{aligned} \text{Material C} &= 2,000 (3.50 - 3.75) \\ &= 2,000 (-0.25) = - \text{Rs. } 500 \end{aligned}$$

Material Price Variance = Rs. 1,125 Unfavourable

**(iii) Material Usage Variance** = Standard Price (SQ – AQ)

$$\begin{aligned} \text{Material A} &= 2 (1.050 - 1,100) \\ &= 2(-50) = \text{Rs. } 100 \end{aligned}$$

$$\begin{aligned} \text{Material B} &= 3.25 (1,500 - 1,400) \\ &= 3.25 (100) = \text{Rs. } 325 \end{aligned}$$

$$\begin{aligned} \text{Material C} &= 3.50 (2,100 - 2,000) \\ &= 3.50 (100) = \text{Rs. } 350 \end{aligned}$$

Material Usage Variance = Rs. 575 Favourable

**Verification :** MCV = MPV + MUV

$$- \text{Rs. } 550 = - \text{Rs. } 1125 + \text{Rs. } 575$$

$$- \text{Rs. } 550 = - \text{Rs. } 550$$

**(d) Material Mix Variance:** Materials mix variance is that part of material usage variance which arises due to changes in standard and actual composition of mix. Materials mix variance is the difference between standard price of standard mix and standard price of actual mix. The standard price is used in calculating this variance. The variance is calculated under two situations: (i) When actual weight of mix is equal to standard weight of mix, and (ii) When actual weight of mix is different from the standard mix.

**(i) When Actual Weight and Standard Weight of Mix is Equal**

In this case the formula for calculating mix variance is : Standard cost of standard mix – Standard cost of actual mix.

(Standard Price x Standard Quantity) – (Standard Price x Actual Quantity) Or  
Standard unit cost (Standard Quantity – Actual Quantity)

In case standard quantity is revised due to shortage of one material, the formula will be equal to Standard unit cost (Revised Standard Quantity – Actual Quantity).

**Example 3.3:** Calculate material mix variance from the data given as such:

Materials (Units)	Standard		Actual	
	Quantity per unit	Price (Units) Rs.	Quantity per unit	Price 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 material B increased by 5%.

Solution:

In this question the standards will be revised. Revised standards will be :

$$\text{Material A} = 50 - 5 (50 \times 10/100) = 45$$

$$\text{Material B} = 100 + 5 (100 \times 5/100) = 105$$

Material Mix Variance = Standard Unit Price (Revised Standard Quantity – Actual quantity)

$$\begin{aligned} \text{Material A} &= 2 (45 - 60) \\ &= 2 (- 15) = - \text{Rs. } 30 \end{aligned}$$

$$\begin{aligned} \text{Material B} &= 1.20 (105 - 90) \\ &= 1.20(15) = \text{Rs. } 18 \end{aligned}$$

Material Mix Variance = –Rs.12 Unfavourable

**(ii) When Actual Weight and Standard Weight of Mix are Different**

When quantities of actual material mix and standard material mix are different, the formula will be:

$$\left\{ \frac{\text{Total Weight of Actual mix}}{\text{Total Weight of Standard mix}} \times \text{Standard cost of Standard} \right\} - \left( \begin{array}{c} \text{Standard} \\ \text{Cost of} \\ \text{Actual} \\ \text{mix} \end{array} \right)$$

In case the standard is revised due to the shortage of one material then revised standard will be used instead of standard, the formula will become:

Total Weight of Actual mix =

$$\left\{ \frac{\text{Total Weight of Revised Standard mix}}{\text{Standard cost of}} \times \text{Revised Standard Mix} \right\} - \left( \begin{array}{c} \text{Standard} \\ \text{Cost of} \\ \text{Actual} \\ \text{mix} \end{array} \right)$$

**Example 3.4:** From the following data calculate various material variances:

Material	Standard		Actual	
	Quantity (units)	Price per unit	Quantity (units)	Price per unit
			Rs.	Rs.
A	80	8.00	90	7.50
B.	70	3.00	80	4.00

**Solution:**

**(a) Material Cost Variance** = Standard Material Cost – Actual Material Cost  
 Cost(Standard Qty. x Standard Price) – (Actual Qty. x Actual Price)

$$\begin{aligned} \text{Material A} &= (80 \times 8) - (90 \times 7.50) \\ &= 640 - 675 = - \text{Rs. } 35 \end{aligned}$$

$$\begin{aligned} \text{Material B} &= (70 \times 3) - (80 \times 4.00) \\ &= 210 - 320 = - \text{Rs. } 110 \end{aligned}$$

Material Cost Variance = Rs. 145 Unfavourable

**(b) Material Price Variance** = Actual Quantity (Standard Price – Actual Price)

$$\begin{aligned} \text{Material A} &= 90 (8.00 - 7.50) \\ &= 90 (0.50) = + \text{Rs. } 45 \end{aligned}$$

$$\begin{aligned} \text{Material B} &= 80 (3.00 - 4.00) \\ &= 80 (-1.00) = - \text{Rs. } 80 \end{aligned}$$

Material Price Variance = Rs. 35 Unfavourable

**(c) Material Usage Variance**= Standard Price (Standard Quantity – Actual Quantity)

$$\begin{aligned} \text{Material A} &= 8 (80 - 90) \\ &= 8 (-10) = - \text{Rs. } 80 \end{aligned}$$

$$\begin{aligned} \text{Material B} &= 3 (70 - 80) \\ &= 3 (-10) = - \text{Rs. } 30 \end{aligned}$$

Material Usage Variance = Rs. 110 Unfavourable

**(d) Material Mix Variance:** In this question standard weight of mix is different from the actual weight of mix, so the formula will be :

$$\frac{\text{Total Weight of Actual Mix}}{\text{Total weight of Standard Mix}} \times \text{Standard Cost of Standard Mix}$$

$$\frac{170}{150} \times 80 \times 80 + 70 \times 3 - [90 \times 8 + 80 \times 3]$$

$$\left( \frac{170}{150} \times 850 - 960 = 963.3 - 960 \right) = \text{Rs. } 3.3 \text{ Favourable}$$

**(e) Materials Yield Variance.** This is the sub-variance of material usage variance. It results from the difference between actual yield and standard yield. It may be defined as that portion of the direct materials usage variance which is due to the standard yield specified and the actual yield obtained. It may arise due to low quality of materials, defective methods of production, carelessness in handling materials, etc.

Material yield variance is calculated with the following formula:

Standard Rate (Actual yield – Standard yield)

Standard Rate is calculated as follows:

$$\text{Std. Rate} = \frac{\text{Standard Cost of Standard mix}}{\text{Net standard output i.e., Gross output – Standard Loss}}$$

There may be a situation where standard mix may be different from the actual mix. In this case the standard is revised in relation to actual mix and the question is solved with the revised standard and not with the original standard. The standard rate will be calculated as follows:

$$\text{Std. Rate} = \frac{\text{Standard Cost of revised Standard mix}}{\text{Net standard output}}$$

In the earlier variances if the standard was more than the actual, the variance was favourable. But, in case of material yield variance the case is different. When actual yield is more than the standard yield, the variance will be favourable.

**Example 3.5:** The standard mix of a product is as under:

60 units at 15 P. per unit	Rs. 9
80 units at 20 P. per unit	Rs. 16
100 units at 25 P. per unit	Rs. 25
240	Rs. 50

Ten units of finished product should be obtained from the above mentioned mix. During the month of January, 1996 ten mixes were completed and the consumption was as follows:

A 640 units at 20 P. per unit	Rs. 128
B 960 units at 15 P. per unit	Rs. 144
C 840 units at 30 P. per unit	Rs. 252
2,440	Rs. 524

The actual output was 90 units. Calculate various material variances.

**Solution:**

**(i) Material Cost Variance:**

The standard has been given for producing 10 units in one mix. Ten mixes have been completed, so standard production will be 100 units. .

Standard cost for 100 Units =  $50 \times 10 = \text{Rs. } 500$

Actual yield is 90 units, so standard cost will be adjusted accordingly. Standard cost for actual yield =  $100 \times 90 = \text{Rs. } 450$

Material Cost Variance = Standard Cost – Actual Cost  
=  $450 - 524 = \text{Rs. } 74$  unfavourable

**(ii) Material Price Variance** = Actual Quantity (Standard Price – Actual Price)

Material A =  $640 (0.15 - 0.20)$   
=  $640 (-0.05) = \text{Rs. } 32$  unfavourable

Material B =  $960 (0.20 - 0.15)$   
=  $960 (0.05) = \text{Rs. } 48$  favourable

Material C =  $840 (0.25 - 0.30)$   
=  $840 (-0.05) = \text{Rs. } 42$  unfavourable

Material price Variance (A + B + C) =  $\text{Rs. } 26$  unfavourable

**(iii) Material Usage Variance:**

The standard quantity will be revised in proportion to actual production. Revised quantity will be :

$$A = \frac{600}{100} \times 90 = 540$$

$$B = \frac{800}{100} \times 90 = 720$$

$$C = \frac{0}{100} \times 90 = 900$$

Standard Price (Standard Quantity – Actual Quantity)

Material A :  $15 \text{ P. } (540 - 640)$



$$15 (-100) = \text{Rs. } 5 \text{ unfavourable}$$

$$\text{Material B : } 20 \text{ P. } (720 - 960)$$

$$20 (- 240) = \text{Rs. } 48 \text{ unfavourable}$$

$$\text{Material C : } 25 \text{ P. } (900 - 840)$$

$$25 (60) = \text{Rs. } 15 \text{ favourable}$$

Material usage Variance = Rs. 48 unfavourable.

#### **(iv) Material Mix Variance**

There is a difference between standard quantity ( $240 \times 10 = 2,400$ ) and actual quantity (2,440), so the standard will be revised first.

Revised standard quantity will be :

$$A = \frac{60}{240} \times 2,440 = 610$$

$$B = \frac{80}{240} \times 2,440 = 813 \text{ (approximately)}$$

$$C = \frac{100}{240} \times 2,440 = 1,017 \text{ (approximately)}$$

Material Mix Variance: Standard Price (Revised Standard Quantity – AQ)

$$\text{Material A : } 15 \text{ P. } (610 - 640)$$

$$15(-30) = \text{Rs. } 4.50 \text{ unfavourable}$$

$$\text{Material B : } 20 \text{ P. } (813 - 960)$$

$$20(-147) = \text{Rs. } 29.40 \text{ unfavourable}$$

$$\text{Material C : } 25 \text{ P. } (1017 - 840)$$

$$25(177) = \text{Rs. } 44.25 \text{ favourable}$$

Material Mix Variance = Rs. 10.35 favourable

**(v) Material Yield Variance** = Standard Rate (Actual Yield – Standard Yield)

$$\text{Standard Rate} = \frac{\text{Standard Cost of revised Standard mix}}{\text{Net standard output}} = \frac{50}{10} = \text{Rs. } 5$$

$$\text{Standard Yield} = 10/240 \times 2440 = 101.67 \text{ units}$$

$$\text{Yield Variance} = 5 (90 - 101.67) = \text{Rs. } 58.35 \text{ unfavourable.}$$

**Verification:**

$$(i) \quad \text{MCV} = \text{MPV} + \text{MUV} \quad \text{or} \quad -74 = -26 - 48 = -74$$

$$(ii) \quad \text{MUV} = \text{MMV} + \text{MYV} \quad \text{or} \quad -48 = 10.35 - 58.35 = -48$$

**Example 3.6.** KSS Ltd. produces an article by blending two basic rawmaterials. It operates a standard costing system and the following standards have been set for raw materials:

Materials	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, 1996, the company produced, 1,700 kg. of finished output.

The position of stock and purchases for the month of April, 1996 is as under:

Material	Stock on	Stock on	Purchased during	
	1-4-96	30-4-96	April, 1996	
	kg	kg	kg	Cost Rs.
A	35	5	800	3,400
B	40	50	1,200	3,000

Calculate the following variances:

(i) Material Price Variance; (ii) Material Usage Variance; (iii) Material Yield Variance; (iv) Material Mix Variance; (v) Total Material Cost Variance.

**Solution:**

Material	Standard Quantity of Material required kg.	Standard Price per kg. Rs.	Standard Cost Rs.
A	800	4	3,200
B	<u>1,200</u>	3	<u>3,600</u>
Total	<u>2,000</u>		<u>6,800</u>

**Standard Cost**

The standard loss is 15% ; so to get 85 finished kgs. 100 kgs.of material are required. Actual finished product is 1,700 kgs; so standard material required will be

$$\left( \frac{1,700 \times 100}{85} \right) = 2,000 \text{ kgs.}$$

Out of 2,000 kgs ; material A will be 800 kgs. (40%) and material B will be 1,200 kgs (60%).

**Calculation of Actual Cost of material used****Material A :**

Opening Stock	:	35 kgs @ Rs. 4 (standard rate)	Rs. 140.00
Out of Purchases	:	795 kgs @ Rs. 4.25 (actual rate)	Rs. 3,378.75
(Purchases – Closing Stock)			<u>Rs. 3518.75</u>

**Material B :**

Opening Stock	:	40 kgs @ Rs. 3 (standard rate)	Rs. 120.00
Out of Purchases	:	1,150 kgs @ 2.50 (actual rate)	Rs 2,875.00
(Purchase – closing stock)			<u>Rs. 6513.75</u>

**Actual Rate :**     Rs. 3400

$$\text{Material A} = \frac{\text{Rs. 3400}}{800 \text{ kgs}} = \text{Rs. 4.25}, \text{ Material B} = \frac{\text{Rs. 3000}}{1200 \text{ kgs}} = \text{Rs. 2.50}$$

**(i) Material Price Variance:**

$$\begin{aligned} \text{Material A} &= (830 \text{ kg} \times 4) - (35 \text{ kgs} \times 4 + 795 \text{ kgs} \times 4.25) \\ &= \text{Rs. 3,320} - \text{Rs. 3,518.75} \\ &= \text{Rs. 198.75 Adverse.} \end{aligned}$$

$$\begin{aligned} \text{Material B} &= (1,190 \text{ kgs} \times 3) - (40 \text{ kgs} \times 3 + 1,150 \text{ kgs} \times 2.50) \\ &= \text{Rs. 3,570} - \text{Rs. 2,995} = \text{Rs. 575 (Favourable)} \end{aligned}$$

$$\text{Total Material Price Variance} = -198.75 + 575 = \text{Rs. 376.25 Favourable.}$$

**(ii) Material Usage Variance:**

Standard Price (Standard Usage–Actual Usage)

$$\text{Material A} : \text{Rs. 4 (800 kgs} - 830 \text{ kgs)} = \text{Rs. 120 Adverse}$$

$$\text{Material B} : \text{Rs. 3 (1, 200 kgs} - 1,190 \text{ kgs)} = \text{Rs. 30 Favourable}$$

$$\text{Total Material Usage Variance} = -120 + 30 = 90 \text{ Adverse}$$

**(iii) Material Yield Variance**

Standard Rate (Actual yield – Standard Yield)

$$= \text{Rs. 4 (1,700 kgs} - 1,717 \text{ kgs)}$$

$$= \text{Rs. 68 Adverse}$$

$$\text{Standard Rate} = \frac{\text{Rs. 6,800}}{1,700 \text{ kgs}} = \text{Rs. 4}$$

$$\text{Standard Yield} = \frac{1,700}{2,000} \times 2,020 = 1,717 \text{ kgs.}$$

**(iv) Material Mix Variance:**

$$\left( \frac{\text{Total Weight of Actual Mix}}{\text{Total Weight of Standard Mix}} \times \text{Standard Rate} \right) - \left( \text{Standard Cost of Actual Mix} \right)$$

$$\left( \frac{2020}{2,000} \times \text{Rs. } 6,800 \right) - (830 \text{ kgs} \times 4 + 1,190 \text{ kgs} \times 4) = \text{Rs. } 6868 - \text{Rs. } 6,890 = \text{Rs. } 22 \text{ Adverse}$$

**(v) Total Material Cost Variance:**

Standard Cost of Materials – Actual Cost of Materials Rs. 6,800 – Rs. 6,513.75  
= Rs. 286.25 Favourable.

### 3.11 CALCULATION OF LABOUR VARIANCES

Labour Variances are discussed as follows:

**(a) Labour Cost Variance**

Labour Cost Variance or Direct Wage Variance is the difference between the standard direct wages specified for the activity and the actual wages paid. It is the function of labour rate of pay and labour time variance. It arises due to a change in either a wage rate or in time or in both. It is calculated as follows:

Labour Cost Variance = Standard Labour Cost – Actual Labour Cost (Standard time × Standard Wage Rate) – (Actual Time × Actual Wage Rate)

**(b) Labour Rate variance or Wage Rate Variance**

It is that part of labour cost variance which arises due to a change in specified wage rate. Labour rate variance arises due to (i) change in basic wage rate or piece-work rate, (ii) employing persons of different grades than specified, (iii) payment of more overtime than fixed earlier, (iv) new workers being paid different rates than the standard rates, and (v) different rates being paid to workers employed for seasonal work or excessive work load.

The wage rates are determined by demand and supply conditions of labour conditions in labour market, wage board awards, etc. So, wage rate variance is

generally uncontrollable except if it arises due to the development of wrong grade of labour for which production foreman will be responsible. This variance is calculated by the formula: Labour Rate of Pay Variance = Actual time (Standard Rate – Actual Rate)

The variance will be favourable if actual rate is less than the standard rate and it will be unfavourable or adverse if actual rate is more than the standard rate.

### **(c) Labour Efficiency or Labour Time Variance**

It is that part of labour cost variance which arises due to the difference between standard labour hours specified and the actual labour hours spent. It helps in controlling efficiency of workers. The reasons for this variance are: (i) lack of proper supervision, (ii) defective machinery and equipment, (iii) insufficient training and incorrect instructions, (iv) increase in labour turnover, (v) bad working Conditions, (vi) discontentment along workers due to unsatisfactory personnel relations, and (vii) use of non-standard material requiring more time to complete work.

Labour efficiency variance is calculated as: Labour efficiency variance = Standard Wage Rate (Standard Time–Actual Time).

If actual time taken for doing a work is more than the specified standard time, the variance will be unfavourable. On the other hand, if actual time taken for a job is less than the standard time, the variance will be favourable.

### **(d) Idle Time Variance**

This variance is the standard cost of actual time paid to workers for which they have not worked due to abnormal reasons. The Reasons for idle time may be power failure, defect in machinery, and non supply of materials, etc. Idle time variance should be segregated from the labour efficiency variance otherwise it will show inefficiency on the part of workers though they are not responsible for this. Idle time variance is always adverse and needs investigation for its causes. This variance is calculated as: Idle Time Variance=Idle Hours x Standard Rate

### **(e) Labour Mix Variance**

This variance arises due to change in the actual gang composition than the standard gang composition. This variance shows to the management how much labour cost variance is due to the change in labour composition.

It may be calculated in two ways:

(i) When **standard and actual times of the labour mix are same**. In this case the variance is calculated as follows:

Labour Mix Variance = Standard Cost of Standard Labour Mix – Standard Cost of Actual Labour Mix.

Due to the non-availability of one grade of labour, there may be a change in standard labour mix, and then revised standard will be used for standard mix. The formula will be: Labour Mix Variance = Standard cost of Revised Standard Labour Mix - Standard Cost of Actual Labour Mix.

**(ii) When standard and actual time of labour mix are different:**

In this case the variance will be calculated as follows:

Total Time of Actual Labour Mix = Total Time of Standard Labour Mix  
(Standard Cost of Actual Labour Mix)

As in the earlier case, if labour composition is revised because of non-availability of one grade of labour then revised standard mix will be used instead of standard mix and the formula will become:

Total Time of Actual Labour Mix

Total Time of Revised Standard Labour Mix x Standard Cost of Revised Standard

Labour Mix - (Standard Cost of Actual Labour Mix)

**Example 3.7 :** The information regarding the composition and the weekly wage rates of labour force engaged on a job scheduled to be completed in 30 weeks:

Category of Workers	Standard		Actual	
	No. of Workers	Weekly Wage rate per worker Rs.	No. of workers	Weekly Wage rate per worker Rs.
Skilled	75	60	70	70
Semi-skilled	45	40	30	50
Unskilled	60	30	80	20

The work was completed in 32 weeks. Calculate various labour variances.

**Solution:**

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

Standard Labour Cost	:	Rs.
Skilled	:	$75 \times 60 \times 32 = 1,44,000$
Semi-skilled	:	$45 \times 40 \times 32 = 57,600$
Unskilled	:	$60 \times 30 \times 32 = 57,600$
		Total 2, 59,200

Actual Labour Cost:

Skilled	:	$70 \times 70 \times 32 = 1,56,800$
Semi Skilled	:	$30 \times 50 \times 32 = 48,200$
Unskilled	:	$80 \times 20 \times 32 = 51,200$
		Total 2,56,200

Total Labour Cost Variance: 2,59,200 – 2,56,200 = Rs. 3,000 Adverse ×  
Standard Cost of Standard Labour Mix

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



Skilled	:	2,240 (60–70)
		2,240 (–10) = Rs. 22,400 Adverse
Semi Skilled	:	960 (40–50)
		960 (–10) = Rs. 9,600 Adverse
Unskilled	:	2,560 (30 – 20)
		2,560 (10) = Rs. 25,600 Favourable
Labour Rate Variance		<u>= Rs. 6,400 Adverse</u>

**(iii) Labour Efficiency Variance** = Standard Rate (Standard Time – Actual Time)

Skilled	:	60(2,250 – 2,240)
		60(10) = Rs. 600 Favourable
Semi Skilled	:	40(1,350-960)
		40(390) = Rs. 15,600 Favourable
Unskilled	:	30(1,800 – 2,560)
		30 ((-760) =Rs. 22,800 Adverse.
Labour Efficiency Variance		<u>= Rs. 6,60 0 Adverse</u>

**Verification:**

Labour Cost Variance = Labour Rate Variance + Labour Efficiency Variance  
 – 13,000 = – 6,400 – 6,600 –13,000=–13,000.

**Example 7.8:** The following data is taken out from the books of a manufacturing company:

Budgeted labour composition for producing 100 articles 20 Men @ Rs. 125 per hour for 25 hours

30 women @ 1.10 per hour for 30 hours

Actual labour composition for producing 100 articles 25 Men @ Rs. 1.50 per hour for 24 hours

25 Women @ Re.1.20 per hour for 25 hours

Calculate: (i) Labour Cost Variance, (ii) Labour Rate Variance, (iii) Labour Efficiency Variance, (iv) Labour Mix Variance.

**Solution:**

**(i) Labour Cost Variance**= Standard Labour Cost – Actual Labour costMen :  
(20 x 25 x 1.25) – (25 x 24 x 1.50)

625 – 900 = Rs.275 Adverse

Women: (30 x 30 x 1.10) – (25 x 25 x 1.20)

990 – 750 = Rs. 240 Favourable

Labour Cost Variance = – 275 + 240 =Rs. 35 Adverse.

**(ii) Labour Rate Variance**= Actual Time (Standard Rate – Actual Rate)

Men : 600 (1.25 –1.50)

600 (–0.25) = Rs. 150.00 Adverse

Women : 625 (1.10– 1.20)

625 (–0.10)= Rs. 62.50 Adverse

Labour Rate Variance = Rs. 212.50 Adverse.

**(iii) Labour Efficiency Variance**= Standard Rate (Standard Time–Actual Time)

Men : 1.25 (500 – 600)

1.25(–100) = Rs. 125 Adverse

Women : 1.10(900-625)

1.10 (275) = Rs. 302.50 Favourable

Labour Efficiency Variance = Rs. 177.50 Favourable

**(iv) Labour Mix Variance:**

Standard time for Men and Women = 1,400 hours

Actual time for Men and Women = 1,225 hours

When standard time of labour mix is different from the actual time of labour mix, the formula for calculating labour mix variance is:

Total Time of Actual Labour Mix x Standard Cost of Revised Standard Standard Time of Revised Standard Labour mix = Labour Mix - (Standard Cost of Actual Labour Mix)

### **3.12 ACCOUNTING TREATMENT OF VARIANCES**

When the financial statements are prepared they contain actual cost figures there is no variances. But, at the time of implementation of standard costing system, the accounting records contain both standard costs and actual costs, by which we calculate variances. Then the next question arises that how to deal with the variances at the end of the accounting period? Which method should be followed for treating them? The accountants suggest a number of methods for this purpose. Some of them are discussed, which may be adopted for the accounting treatment of variances:

- 1. Transfer to Profit and Loss Account.** Under this method all variances are transferred to profit and loss account. In this method, the stock of finished goods, work-in-progress and cost of sales are shown at standard cost. It is considered that variances arise due to insufficiency or waste, so these should not become a part of normal cost of production.
- 2. Allocation of Variances to Finished Stock.** In this method, variances are apportioned to finished goods, work-in-progress and cost of sales either on the basis of value of closing balances or on the basis of units. This method has the effect of recording actual costs in the financial statements. The adjustment of variances is made only in the general ledger and not in subsidiary books. The distribution of variances is not made to

products. The variances not being actual losses should not be taken to profit and loss account.

- 3. Transfer of Variances to the Reserve Account.** In this method cost variances are taken to next accounting period as deferred items. The variances whether favourable or adverse are transferred to a reserve account and are offset against future fluctuations. If the variances are favourable then they are taken to the liability side of the balance sheet and they are set off against adverse variances in future. On the other hand, if variances are adverse then these are taken to the balance sheet as a deferred charge and are written off against future favourable variances. This method is not in common use but it may be useful in cases where seasonal fluctuations occur so that favourable and adverse variances may be written off in the course of a business cycle concerning more than one accounting period.

### **3.13 SUMMARY**

Firms use the standard costing technique, in combination with an appropriate product costing method, for managing costs. Engineering driven standards for usage of resources are set, which are converted into rupee value by using budgeted process. Therefore, while standard quantities are not revised unless warranted by changes in product specification, design or process of manufacturing, standard prices are revised on yearly basis. A firm may set standards at an ideal level or at the attainable level or at the basic level depending on the objective it desires to achieve through the standard costing system. The key to a standard costing system is variance reporting. Variances between actual and standards are reported for investigation and corrective actions are taken to remove the causes of adverse variances. Favourable variances must also be investigated and standards are reviewed and revised, if necessary. Sales variances are presented either in term of variances in margin or in terms of variances in turnover. Usually, a comprehensive report, which, reconciles the actual profit and the budgeted profit, is presented showing sales and cost variances. Many firms maintain cost ledger within a standard costing system. The three important methods of accounting are: partial plan or output

plan, single plan or input plan and dual plan. These methods treat variances differently while basic principles of book-keeping are the same in all three methods.

### 3.14 GLOSSARY

**Standard costing:** It is the practice of substituting an expected cost for an actual cost in the accounting records, and then periodically recording variances showing the difference between the expected and actual costs.

**Material variance:** It is the difference between the actual cost incurred for direct materials and the expected (or standard) cost of those materials.

**Direct labour cost variance :** It is the difference between the standard cost for actual production and the actual cost in production.

**Estimated cost:** Estimated costs are based on historical accounting. It is an estimate of what the cost will be. It is a cost of guesswork or reasonable estimate for the costs in future.

### 3.15 SELF-TEST QUESTIONS

1. What is meant by Standard Costing? Distinguish between Standard Cost and Estimated Cost?
2. What are the advantages of Standard Costing? Also discuss the limitations of standard costing.
3. Distinguish between Standard Costing and Budgetary Control.
4. Discuss the preliminary steps for establishing a system of standard costing.
5. Write short notes on the following:
  - (a) Current Standard
  - (b) Basic Standard
  - (c) Normal Standard.
6. Describe the managerial uses of variance analysis.

7. Explain in brief the various types of variances used in standard costing.
8. Distinguish between standard costs and estimated costs.
9. "Variance analysis is an integral part of standard costing system." Explain.
10. Discuss the accounting treatment for variance.
11. Describe briefly the procedures of estimating standard costs within the divisions of materials, labour and overhead costs.
12. The standard material required for production is 10,500 kgs. A price of Rs. 2 per kg has been fixed for the materials. The actual quantity of materials used for the product is 11,000 kgs. A sum of Rs. 24,750 has been paid for the materials.

Calculate: (i) Material Cost Variance, (ii) Material Rate Variance, and (iii) Material Usage Variance. [Ans. (i) Rs. 3,750 Adv., (ii) Rs. 2,750 Adv.; (iii) Rs. 1,000 Adv.]

13. The standard cost of a chemical mixture is :

40% Material A at Rs. 20 per kg. 60%

Material B at Rs. 30 per kg.

A standard loss of 10% is expected in production. During a period, there is used: 90 kgs Material A at a cost of Rs. 18 per kg. 110 kgs material B at a cost of Rs. 34 per kg. The weight produced is 182 kgs. of good product. Calculate (a) Material price variance, (b) Material mix variance, (c) Material yield variance, and (d) Material cost variance. [Ans. (a) Rs. 260 Adv. ; (b) Rs. 100 Fav. ; (c) Rs. 52 Fav. ; (d) Rs. 108 Adv.]

14. The standard material cost to produce a tonne of chemical S is :

200 kg of material A @ Rs. 10 per kg.

300 kg of material B @ Rs. 5 per

kg.400 kg of material C @ Rs. 7 per kg.

During the period, 100 tonnes of mixture S were produced from the usage of: 30 tonnes of material A at a cost of Rs. 9,000 per tonne

40 tonnes of material B at a cost of Rs. 6,000 per tonne

50 tonnes of material C at a cost of Rs. 7,000 per tonne.

Calculate: (a) Material Cost Variance, (b) Material Price Variance, and (c) Material Usage Variance. [Ans. (a) Rs. 2,30,000 Adv.; (b) Rs. 10,000 Adv. (c) Rs. 2,20,000 Adv.]

15. In a factory 100 workers are engaged and the average rate of wage is 50 paise per hour. Standard working hours per week are 40 and the standard performance is 10 units per gang hour. During a week in March, wages paid for 50 workers were at the rate of 50.paise per hour, 10 workers at 70 paise per hour and 40 workers at 40 paise per hour. Actual output was 380 units. The factory did not work for five hours due to breakdown of machinery. Calculate appropriate labour variances. [Ans.(a) LCV = Rs. 20 Adv.; (b)LRV = Rs. 80 Fav. ; (c) LEV =Rs. 150 Fav.. ; (d) Idle Time Variance = 250 Adv. (e) LYV = Rs. 150 Fav.] .
16. From the following information compute: (i) Fixed Overheads Variance, (ii) Expenditure Variance, (iii) Volume Variance, (iv) Capacity Variance, and (v) Efficiency Variance.

	Budget	Actual
Fixed Overheads for November	Rs. 20,000	20,400
Units of Production in November	10,000	10,400
Standard time for 1 Unit	= 2 hours	
Actual Hours Worked	= 20, 100 hours	

(Ans. (i) Rs. 300 Un favourable, (ii) Rs. 400 Unfavourable, (iii) Rs. 100 Favourable, (iv) Rs. 800 Favourable, and (v) Rs. 700 Unfavourable.

### **3.16 SUGGESTED READINGS**

- Ashish K. Bhattacharya, Principles and Practices of Cost Accounting (3<sup>rd</sup>.), New Delhi: Prentice Hall of India Private Limited, 2004.
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## **CASH FLOW ANALYSIS**

### **STRUCTURE**

- 4.1 Introduction
- 4.2 Objective
- 4.3 Meaning of the cash flow statement
- 4.4 Classification of Cash Flow
- 4.5 Format of Cash Flow Statement
- 4.6 Comparison between Cash Flow Statement and Fund Flow Statement
- 4.7 Uses and significance of cash flow statement
- 4.8 Limitations of Cash Flow Statement
- 4.9 Meaning of budget and its features
- 4.10 Preparation of Cash Flow Statement using AS-3 (revised)
- 4.11 Procedure for preparing cash flow statement
- 4.12 Preparation of cash budget
- 4.13 Summary
- 4.14 Glossary
- 4.15 Self assessment Questions
- 4.16 Suggested Reading

## **4.1 INTRODUCTION**

The statement of changes in financial position based on working capital is of immense use in long-range financial planning. The long-term financing and investment activities are specifically portrayed. The net working capital requirements are shown as residual figures. However, the working capital concept may conceal or exclude too much. It treats increase in inventories and account receivable as equaling to an increase in bank overdraft. This is not a correct treatment. In fact, accrued expenses like wages and salaries may become payable in next 10 days or so: sundry creditors bills may fall due for payment during the next one month, where as bank overdraft may be for a longer period of, say three months or even more. Similarly, inventories and account receivables undergo a transformation before they become money assets. It is possible that there is sufficient net working capital as revealed by the statement of changes in financial position, and yet the firm may be unable to meet its current liabilities as and when they fall due. It may be due to a sizeable piling up of inventories and an increase in debtors caused by a slow-down in collections. The firm's failure to meet its short-term commitments, in spite of its sound long-range financial position and adequate profitability, may plunge it to technical insolvency. Therefore, in making plans for the more immediate future, the management is vitally concerned with a statement of cash flow, which provides more detailed information. Such a statement is useful for the management to assess its ability to meet obligation to trade creditors, to pay bank loans, to pay interest to debenture-holders and dividends to its shareholders. Furthermore, the projected cash flow statement prepared month wise or so can be useful in presenting information of excess cash in some months and shortage of cash in others. By making available such information in advance the statement of cash flow enables the management to revise its plan. So, in order to avoid the technical insolvency and to get aware about the short-term liquidity position management have to make Cash Flow Statement.

## **4.2 OBJECTIVES:**

After reading this chapter you will be able to: prepare a statement of changes in cash.

1. To prepare statement of sources and applications of cash.

2. To understand why after a high profit cash position become worst.
3. To understand the nature of cash budget.

#### **4.3 MEANING OF THE CASH FLOW STATEMENT**

Cash Flow Statement is a statement that describes the inflow (sources) and outflow (applications) of cash and cash equivalent in an enterprise during a specified period of time. Such a statement enumerates net effect of the various business transactions on cash and its equivalent and takes into account receipts and disbursement of cash. Cash flow statement summaries the causes of changes in cash position of a business enterprise between dates of two balance sheets. According to AS-3 (revised), an enterprise should prepare a cash flow statement and should present it for each period for which financial statements are prepared. The term cash, cash equivalent and cash flow are used in the statement with the following meanings:

Cash comprises cash in hand and demand deposit with bank.

Cash Equivalents are short term highly liquid investments that are readily convertible into known amounts of cash and which are subject to an insignificant risk of change in value. Cash equivalent are held for the purpose of meeting short term cash commitments rather than for investment or other purposes. An investment normally qualifies as a cash equivalent only when it has a short-maturity, of say, three months or less from the date of acquisitions.

Cash flow means movement of funds that may be toward outside called outflow of cash and that may be from outside to inside business called inflow of cash. In another words, flow of cash is said to have taken place when any transaction makes changes in the amount of cash and cash equivalent before happening of the transaction.

Cash flows exclude movements between items that constitute cash or cash equivalent because these components are part of the cash management of an enterprise rather than part of its operating, investing and financing activities. Cash management includes the investment of excess cash in cash equivalent.

In other words, a cash flow statement is a statement that depicts changes in cash position from one period to another. For example, if the cash balance of a business is shown by its Balance Sheet on 31<sup>st</sup> Dec. 2003 is Rs. 20,000 while the cash balance as per its Balance Sheet on 31<sup>st</sup> Dec. 2004 is Rs.30,000, there has been an inflow of cash of Rs.10,000 in the year 2004 as compared to the year 2003. The cash flow statement explains the reasons for such inflows or outflows of cash, as the case may be. It also helps management in making plans for the immediate future. A projected cash flow will be available to meet obligation to trade creditors, to pay bank loans and to pay dividend to the shareholders.

#### **4.4 CLASSIFICATION OF CASH FLOW**

According to AS-3, the cash flow statement should report cash flows during the period classified by operating, investment and financing activities as follows:

Cash flow from operating activities

Cash flow from investing activities

Cash flow from financing activities

1. **Cash flow from operating activities** involves cash generated by producing and delivering goods and providing services. Cash inflow includes receipts from customers for sales of goods and services (including collection of debtors). Cash outflow from operating activities include payments to suppliers for purchase of material and for services, payment to employees for services and payment to governments for taxes and duties. Then by comparing the inflow and outflow of cash we can determine the net value of cash flows. If the inflows are more than outflows then it is called cash generated from operating activities or if cash outflows are more than cash inflows then it is called cash lost in operating activities. This cash flow is a key indicator of the extent to which the operations of the enterprise have generated sufficient cash flows to maintain the operating capability of the enterprise, pay dividend, repay loans and make new investments without recourse to external sources of financing. Information about the specific

component of historical operating cash flows is useful, in conjunction with other information, in forecasting future operating cash inflows.

Examples of cash flows from operating activities are:

Cash receipts from the sale of goods and rendering the services.

Cash receipts from royalties, fees, commission and other revenue.

Cash payment to suppliers of goods and services.

Cash payment to and on behalf of employees.

Cash receipts and cash payment of an insurance enterprise for premium and claims, annuities and other policy benefits.

Cash payment and refund of income tax unless they can be specifically identified with financing and investing activities.

Cash receipts and payments relating to futures contract, forward contracts, option contracts and swap contracts when the contracts are held for dealing or trading purpose.

Some transactions, such as the sale of an item of plant, may rise to a gain or loss that is included in the determination of the net profit or loss. However, the cash flow relating to such transactions are cash flows from investing activities.

- 2 Cash flow from investing activities involves** the cash generated by making and collecting loans and acquiring and disposing of debts and equity instruments and fixed assets. Cash inflows from investing activities are receipts from collection of loans, receipts from sales of shares, debts or similar instruments of other enterprises, receipts from sale of fixed assets and interest and dividend received from loans and investments. Cash outflows from investing activities are disbursement of loans, payments to acquire share debts or similar instruments of other enterprise and payment to acquire fixed assets. Cash receipts and payments relating to futures contract, forward contracts, option contracts and swap contracts except when the contracts

are held for dealing or trading purpose or the payments or receipts are classified as financing activities.

- 3 Cash flows from financing activities** involves cash generated by obtaining resources from owners and providing them with a return on their investment, borrowing money and repaying amounts borrowed and obtaining and paying for other resources obtained from creditors on long-term credit. Cash flows from financing activities involve the proceeding from issuing share or other similar instrument, debentures, mortgages, bonds and other short term or long-term borrowings. Cash outflow from financing activities are payments of dividend, payments to acquire or redeem shares to other similar instruments of the enterprise, payment of amount borrowed, principal payment to creditors who have extended long-term credit and interest paid.

It is important to note down that the classification of the cash flows into operating, investing and financing categories will depend upon the nature of the business. For example, for financial institutions like banks lending and borrowing are parts of their business operations. So the income and expenditure regarding the borrowing and lending will be included in the cash flow from operating activities.

#### 4.5 FORMAT OF CASH FLOW STATEMENT

AS-3 (Revised) has not provided any specific format for preparing a cash flow statement. The cash flow statement should report cash flows during the period classified by operating, investing and financing activities. A widely used format of cash flow statement is given below.

**COMPANY'S NAME:.....**

**Cash Flow Statement**

For the year ended.....

<b>Particulars</b>	<b>Rs.</b>	<b>Rs.</b>
<b>Cash flow from Operating Activities</b> (List of the individual inflows and outflows)	.....	

Net Cash Flow from Operating Activities	_____	.....
<b>Cash Flows from Investing Activities</b>		
(List of individual inflows and outflows)	.....	
	_____	
Net Cash Flows from Investing Activities		.....
<b>Cash Flows from Financing Activities</b>		
(List of individual inflows and outflows)		.....
	_____	
Net Cash Flows from Financing Activities		.....
<b>Net increase (Decrease) in Cash and Cash Equivalents</b>		.....
Cash and cash Equivalent at the Beginning of the period		.....
Cash and cash Equivalent at the End of the period		.....
		_____
		_____

#### 4.6 COMPARISON BETWEEN FUNDS FLOW AND CASH FLOW STATEMENT

The term funds have a variety of meaning. In narrow sense, it means cash and the statement of changes in the financial position prepared on cash basis is called a cash flow statement. In the most popular sense, the term funds refer to working capital and a statement of changes in the financial position prepared on this basis is called a funds flow statement. A cash flow statement is much similar to a funds flow statement as both are prepared to summarize the causes of changes in the financial position of a business. However the following are the main differences between funds and a cash flow statement.

<b>Difference between Funds Flow Statement and Cash Flow Statement</b>		
<b>Basis of Difference</b>	<b>Funds Flow Statement</b>	<b>Cash Flow Statement</b>
Basis of Concept	It is based on a wider concept of funds, i.e. working capital	It is based on a narrow concept of funds, i.e. cash
Basis of Accounting	It is based on accrual basis of accounting.	It is based on cash basis of accounting.
Schedule of changes in working capital	Schedule of changes in working capital is prepared to show the changes in current assets and current liabilities.	No schedule of changes in working capital is prepared.
Method of Preparing	Funds flow statement reveals the sources and applications of funds. The net difference between sources and financees. funds represents net increase in working capital.	It is prepared by classifying all inflows and outflows in term of operating, financing and investing activities. The net difference represents increase or decrease in cash & cash equivalents.
Basis of Usefulness	It is useful in planning intermediate and long term financing.	It is useful for short-term analysis & cash planning of business.
Description	It describes the reasons for change in working capital. cash equivalent.	It describes the reasons for changes in cash and cash equivalent.

#### **4.7 USES AND SIGNIFICANCE OF CASH FLOW STATEMENT**

The main purpose of the statement of cash flows is to provide relevant information about the cash receipts and cash payments of an enterprise during a



period. The information will help users of financial statements to assess the amounts, timing and uncertainty of prospective cash flows to the enterprise. The statement of the cash flows is useful to them in assessing an enterprise's liquidity, financial flexibility, profitability and risk. It also provides a feedback about the previous assessments of these factors. Investors, analyst, creditors, managers and others will find the information in the statement of cash flows helpful in assessing the following:

1. It is very useful in the evaluation of cash position of a firm.
2. A projected cash flow statement can be prepared in order to know the future cash position of a concern so as to enable a firm to plan and coordinates its financial operations properly.
3. A comparison of historical and projected cash flow statement can be made so as to find the variation and deficiency or otherwise in the performance so as to enable the firm to take immediate and effective actions.
4. A series of intra firm and inter firm cash flow statement reveals whether the firm's liquidity is improving or deteriorating over a period of time.
5. Cash flow statement helps in planning the repayment of loans, replacement of fixed assets and other similar long term planning of cash.
6. Cash flow analysis is more useful and appropriate than funds flow analysis for short-term financial analysis as in a very short period it is cash, which is more relevant, then the working capital for forecasting the ability of the firm to meet its immediate obligations.
7. Cash flow statement prepared according to AS-3 is more suitable for making comparison than the funds flow statement, as there is no standard format used for the same.
8. Cash flow statement provides information of all activities classified under operating, investing and financing activities.

#### **4.8 LIMITATIONS OF CASH FLOW STATEMENT**

Despite a numbers of uses, cash flow statement suffers from the following limitations:

1. As cash flow statement is based on cash basis of accounting, it ignores the basic accounting concepts of accrual basis.
2. Some people feel that as working capital is a wider concept of funds. Funds flow statement provides a more complete picture than cash flow statement. So it is based on narrow concept.
3. Cash flow statement is not suitable for judging the profitability of a firm as non-cash charges are ignored while calculating cash flows from operating activities.

#### **4.9 MEANING OF BUDGET AND ITS FEATURES**

The Chartered Institute of Management Accountants, England, defines a ‘budget’ as under:

“A financial and/or quantitative statement, prepared and approved prior to define period of time, of the policy to be perused during that period for the purpose of attaining a given objective.”

According to Brown and Howard of Management Accountant “a budget is a predetermined statement of managerial policy during the given period which provides a standard for comparison with the results actually achieved.”

An analysis of the above said definitions reveal the following essentials of a budget:

- It is prepared for a definite future period.
- It is a statement prepared prior to a defined period of time.
- The budget is monetary and/or quantitative statement of policy.
- The budget is a predetermined statement and its purpose is to attain a given objective.

#### **Forecast Vs Budget**

A budget, therefore, be taken as a document which is closely related to both the managerial as well as accounting functions of an organization. Forecast is

mainly concerned with an assessment of probable future events. Budget is a planned result that an enterprise aims to attain. Forecasting precedes preparation of a budget as it is an important part of the budgeting process. It is said that the budgetary process is more a test of forecasting skill than anything else. A budget is both a mechanism for profit planning and technique of operating cost control. In order to establish a budget it is essential to forecast various important variables like sales, selling prices, availability of materials, prices of materials, wage rates etc. both budgets and forecasts refer to the anticipated actions and events. But still there are wide differences between budgets and forecasts as given below:

<b>Differences between Forecasting and Budgets</b>	
<b>Forecasts</b>	<b>Budgets</b>
1. Forecasts is mainly concerned with anticipated or probable events.	1. Budget is related to planned events.
2. Forecasts may cover for longer period or years.	2. Budget is planned or prepared for a shorter period.
3. Forecast is only a tentative estimate.	3. Budget is a target fixed for a period.
4. Forecast results in planning.	4. Result of planning is budgeting.
5. The function of forecast ends with the forecast of likely events.	5. The process of budget starts where forecast ends and converts it into a budget.
6. Forecast usually covers a specific business function.	6. Budget is prepared for the business as a whole.
7. Forecasting does not act as a tool of controlling measurement.	7. Purpose of budget is not merely a planning device but also a controlling tool.

#### **4.10 PREPARATION OF CASH FLOW STATEMENT USING AS-3 (REVISED)**

AS-3 (Revised) has also provided for the treatment of cash flow from some peculiar items as discussed below:

- 1) Extraordinary items:** The cash flow from extraordinary items just like winning the lottery, loss by fire etc. either classified as arising from operating, investing or financing activities as appropriate and separately disclosed in the cash flow statement to enable users to understand their nature effect on the present and future cash flows of the enterprise.
- 2) Interest and Dividend:** A great care have to be taken regarding the interest and dividend as receivable of the interest and dividend is a result of investment so it is considered as cash inflow from investing activities while payment of dividend and interest arise due to collection of finance so it is termed as cash outflow from financing activities. But in case of a financial institution payment and receipts of interest and dividend are related to their main business so these items are treated under the head of cash flow from operating activities.
- 3) Taxes on Income:** Taxes paid by the business should be treated as cash outflow generated by operating activities if nothing is stated in the problem but if it is specified in question that the tax arise due to financing and investing activities then that tax should be treated under respective activities.
- 4) Acquisitions and Disposal of Subsidiaries and other Business Units:** The aggregate cash flows arising from acquisitions and from disposal subsidiaries or other business units should be presented separately and classified as investing activities. The separate presentation of the cash flow effects of acquisitions and disposal of subsidiaries and other business units as single line items helps to distinguish these cash flows from other cash flows. The cash flow effects of disposal are not deducted from those of acquisitions.

- 5) **Foreign Currency Cash Flow:** Cash flows arising from transactions in a foreign currency should be recorded in an enterprise's reporting currency by applying to the foreign currency amount the exchange rate between the reporting currency and the foreign currency at the date of the cash flow. The effect of the changes in exchange rates on cash and cash equivalents held in a foreign currency should be reported as a separate part of the reconciliation of the changes in cash and cash equivalents during the period.

Unrealized gains and loss arising from changes in foreign exchange rates are not cash flows. However, the effect of exchange rate changes on cash and cash equivalent held is reported in the cash flow statement in order to reconcile the value of cash and cash equivalent at the beginning and the end of the period. This amount is presented separately from cash flows from operating, investing and financing activities and includes the difference, if any.

- 6) **Non-Cash Transactions:** There are some transactions, which do not affect the cash positions of the business directly but affect the capital and asset structure of an enterprise. Such as the conversion of debts into equity, the acquisitions of an enterprise by means of issue of shares etc. These transactions should not be included in the cash flow statement but due to their importance these can be shown as additional information under the statement.

#### 4.11 PROCEDURE FOR PREPARING A CASH FLOW STATEMENT

Let us study how to construct the cash flow statement. As shown in the format of the cash flow statement all the cash inflows and outflows will be classified according to operating, investing and financing activities. Following are the procedures of the calculation of cash flow from different activities: -

**Determination of cash flow from operating activities:** The profit and loss accounts shows whether an enterprise's operations have results in profit or loss, but it does not indicate cash inflows and cash outflows from operating activities. This is because net profit is computed using the accrual basis of accounting. Revenue is recorded when earned although the cash for some of them may not

have been collected, and expenses are recorded when incurred although all of them may not have been paid in cash. Further, depreciation, amortization and provision for doubtful debts do not reflect cash outflows in both current and future periods. Thus, the net profit will not indicate the net cash flow from operations. In order to arrive at net cash flow from operating activities, it is necessary to restate revenues and expenses on a cash basis. This is done by adjusting for the effects of transactions considered in preparing the profit and loss account that did not involve cash inflows or cash outflows. There are two methods for reporting the net cash flow from operating activities.

- 1) Direct method
- 2) Indirect method

**1) Direct method:** Under this method, cash receipts from operating activities and cash payments for operating expenses are calculated to arrive at cash flows from operating activities. The difference between the cash receipts and cash payments is the net cash flow provided by operating activities. Cash flow from operating activities can be calculated as follow:

**Cash Flow from Operating Activities:**

Cash received from customers	XXX
Cash paid to suppliers and employees	<u>(XXX)</u>
Cash generated from operations	XXX
Income tax paid	<u>(XXX)</u>
Cash flow before extraordinary item	XXX
Extraordinary item	<u>(XXX)</u>
Net cash flow from operating activities	<u>XXX</u>

**Cash received from customers:** Cash receipts from customers from cash sales and collections of debtors arising from credit sales. Cash sales result in cash inflows in the current period. However, collections from customers require additional calculations, sales from an earlier period may be collected in the current period,

sales from the current period may be collected in future period or some debtors may not be collected at all. As a result, collection from customers in current period are seldom equal to credit sales. The relationship among the credit sales, change in debtors and collections from customers may be stated in equation form as follows:

Cash received from customers = Sales + Opening balance of trade debtors (Debtors & B/R) – Closing balance of trade debtors.

**Cash paid to suppliers and employees:** After calculation of cash received from customers the second thing that would be calculating is cash paid to suppliers and employees in lieu of services and goods received from them. Cash paid to customers and employees can be calculated by using following equation: Cash Paid to suppliers and employees = Purchases for the year as per statement of profit + Opening trade creditors (Creditors & B/P) – Closing trade creditors + selling and administrative expenses + prepaid expenses at the end of the year – prepaid expenses in the beginning of the year.

**Income tax paid:** The amount of the income tax paid usually differs from the estimated income tax expense, appearing on the profit and loss account. Also a part of the income tax expenses for a year is paid in the following year. The difference between income tax payment and income tax expense result in a change in income tax payable. The following equation shows this relationship:

Tax paid during the year = Opening balance of tax unpaid + Provision made during the year – Closing balance of tax unpaid.

Let us take an example to understand these treatments.

**Illustration 4.1. The following information is available from the books of Exclusive Ltd. for the year ended 31st March, 2016 :**

- (a) Cash sales for the year were Rs. 10,00,000 and sales on account Rs. 12,00,000.
- (b) Payments on accounts payable for inventory totalled Rs. 7,80,000.
- (c) Collection against accounts receivable were Rs. 7,60,000.

- (d) Rent paid in cash Rs. 2,20,000, outstanding rent being Rs. 20,000.
- (e) 4,00,000 Equity shares of Rs. 10 per value were issued for Rs. 48,00,000.
- (f) Equipment was purchased for cash Rs. 16,80,000.
- (g) Dividend amounting to Rs. 10,00,000 was declared, but yet to be paid.
- (h) Rs. 4,00,000 of dividends declared in the previous year were paid.
- (i) An equipment having a book value of Rs. 1,60,000 was sold for Rs. 2,40,000.
- (j) The cash account was increased by Rs. 37,20,000.

Prepare a cash flow statement using direct method.

**Solution :**

Cash flow statement of Exclusive Limited for the year ended 31st March, 2016 (Direct Method) (₹)

Cash flows from Operating Activities		
Cash receipts from customers (10,00,000 + 7,60,000)	17,60,000	
Cash paid to suppliers and for rent	<u>(10,00,000)</u>	
Net cash flows from Operating Activities (A)		7,60,000
Cash flows from Investing Activities		
Sale of equipment	2,40,000	
Purchase of equipment	<u>(16,80,000)</u>	
Net cash used in Investing Activities (B)		(14,40,000)
Cash flows from Financing Activities		
Issue of equity shares (including premium)	48,00,000	
Dividends paid	<u>(4,00,000)</u>	
Net Cash flows from Financing Activities (B)		<u>44,00,000</u>
Net increase in cash and cash equivalents (A) +(B) + (C)		<u>37,20,000</u>

**Illustration 4.2. Madhuri Ltd. gives you the following information for the year ended 31st March, 2016 :**

- (a) Sales for the year totalled Rs. 96,00,000. The company sells goods for cash only.



- (b) Cost of goods sold was 60% of sales.
- (c) Closing inventory was higher than opening inventory by Rs. 43,000.
- (d) Trade creditors on 31st March, 2016 exceeded those on 31st March, 2015 by Rs. 23,000.
- (e) Tax paid amounted to Rs. 7,00,000.
- (f) Depreciation on fixed assets for the year was Rs. 3,15,000 whereas other expenses totalled Rs. 21,45,000. Outstanding expenses on 31st March, 2015 and 31st March, 2016 totalled Rs. 82,000 and Rs. 91,000 respectively.
- (g) New machinery and furniture costing Rs. 10,27,500 in all were purchased.
- (h) A rights issue was made of 50,000 equity shares of Rs. 10 each at a premium of Rs. 3 per share. The entire money was received with applications.
- (i) Dividends totalling Rs. 4,00,000 were distributed among shareholders.
- (j) Cash in hand and at bank as at 31st March, 2015 totalled Rs. 2,13,800.
- You are required to prepare a cash flow statement using direct method.

**Solution :**

Calculation of Cash paid to Suppliers and Employees		(₹)
Cost of sales (60% of ₹ 96,00,000)		57,60,000
Add : Expenses incurred		21,45,000
Outstanding expenses on 31st march, 2015		82,000
Excess of closing inventory		<u>43,000</u>
		80,30,000
Less : Excess of closing creditors over opening creditors	23,000	
Outstanding expenses on 31st March, 2016	<u>91,000</u>	<u>1,14,000</u>
		79,16,000

**Proceeds from issue of share capital :**

Issue price of one share = Rs. 10 + Rs. 3 = Rs. 13

Proceeds from issue of 50,000 shares = Rs. 13 × 50,000 = Rs. 6,50,000

**Solution :**

Cash flow statement of Madhuri Ltd. for the year ended 31st March, 2016		(₹)
(A)	Cash flow from Operating Activities	
	Cash receipts from customers	96,00,000
	Cash paid to suppliers and employees	<u>(79,16,000)</u>
	Cash inflow from operations	16,84,000
	Tax paid	<u>(7,00,000)</u>
	Net cash from Operating Activities	9,84,000
(B)	Cash flow from Investing Activities	
	Purchase of fixed assets	<u>(10,27,500)</u>
	Net cash used in Investing Activities	(10,27,500)
(C)	Cash flow from Financing Activities	
	Proceeds from issue of share capital	6,50,000
	Dividends paid	<u>(4,00,000)</u>
	Net cash from Financing Activities	<u>2,50,000</u>
	Net increase in cash and cash equivalents (A+B+C)	2,06,550
	Cash and cash equivalents as on 31st March, 2015 (opening balance)	<u>2,13,800</u>
	Cash and cash equivalents as on 31st March, 2016 (closing balance)	<u>4,20,300</u>

**Illustration 4.3 The summary of cash transactions extracted from the books of Happy Ltd. are :**

	(₹ '000)
Balance as on 1st April, 2015	140
Receipts from customers	11,132
Issue of shares	1,200
Sale of fixed assets	512
	<u>12,984</u>
Payment to suppliers	8,188
Payment for fixed assets	920
Payment for overheads	460
Wages and Salaries	276
Taxation	972

Dividends	320
Repayment of bank loans	1,000
	<u>12,136</u>
Balance as on 31st March, 2016	848

You are required to prepare a cash flow statement of the company for the period ended 31st March, 2016 in accordance with the Indian Accounting Standard-3 (Revised).

**Solution :**

Cash flow Statement for the period ending 31st March, 2016		(₹ '000)
(A)	Cash flow from Operating Activities	
	Receipts from customers	11,132
	Payment to suppliers	(8,188)
	Payment of wages and salaries	(276)
	Payment of overheads	(460)
	Payment of taxes	<u>(972)</u>
	Net cash from Operating Activities (A)	1,236
(B)	Cash flow from Investing Activities	
	Proceeds on sale of fixed assets	512
	Acquisition of (payments) fixed assets	<u>(902)</u>
	Net cash used in Investing Activities (B)	(408)
(C)	Cash flow from Financing Activities	
	Proceeds on issue of shares	1,200
	Payments of dividends	(320)
	Repayments of bank loans	<u>(1,000)</u>
	Net cash used in Financing Activities (C)	<u>(120)</u>
	Net increase in cash and cash equivalents (A+B+C)	708
	Cash and cash equivalents at the beginning of the period	140
	Cash and cash equivalents as the end of the period	<u>848</u>

**Illustration 4.4** Following information is available from the books of Standard Company Ltd. :

Particulars	2015	2016
Profit made during the year		2,50,000
Income received in advance	500	600
Prepaid expenses	1,600	1,400
Debtors	80,000	95,000
Bills receivable	25,000	20,000
Creditors	45,000	40,000
Bills payable	13,000	15,000
Outstanding expenses	2,500	2,000
Accrued income	1,500	1,200

Calculate cash flow from operations.

**Solution :**

Statement showing Cash flow from Operations	(₹)	
Profit made during the year		2,50,000
Add : Decrease in Debtors	15,000	
Increase in Creditors	5,000	
Increase in Outstanding expenses	500	20,500
		2,70,500
Less : Decrease in Income received in advance	100	
Increase in Prepaid expenses	200	
Increase in Bills receivable	5,000	
Decrease in Bills payable	2,000	
Increase in Accrued income	300	7,600
Cash generated from Operations		2,62,900

**Illustration 4.5 From the following calculate cash from operations :**

Profit and Loss Account for the year ended 31st March, 2016

Particulars	₹ '000	Particulars	₹ '000
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 tax	5,000		
To Net profit	10,000		
	<u>33,000</u>		<u>33,000</u>

**Solution :**

Statement showing Cash Generated From Operations		(₹ '000)
Net Profit		10,000
Add : Non cash Items :		
Depreciation	2,000	
Loss on sale of plant	1,000	
Goodwill written off	4,000	
Proposed dividend	5,000	
Provision for tax	<u>5,000</u>	<u>17,000</u>
		27,000
Less : Non operating Income :		
Profit on sale of land	5,000	
income-tax refund	<u>3,000</u>	<u>8,000</u>
Funds from Operations		19,000
Add : Decrease in current assets		Nil
Increase in current liabilities		
Less : Increase in current assets		Nil
Decrease in current liabilities		
Cash generated from Operations		<u>19,000</u>

**Illustration 4.6 Swastik Oils Ltd. has furnished the following information for the year ended 31st March, 2016 :**

	(₹ lakhs)
Net profit	37,500.00
Dividend (including interim dividend paid)	12,000.00
Provision for income-tax	7500.00
Income-tax paid during the year	7,372.00
Loss on sale of assets (net)	60.00
Book value of assets sold	277.50
Depreciation charged to Profit & Loss Account	30,000.00
Profit on sale of investments	150.00
Value of investments sold	41,647.50
Interest Income on investments	3,759.00
Interest expenses	15,000.00
Interest paid during the year	15,780.00
Increase in working capital (excluding cash and bank balance)	84,112.50
Purchase of fixed assets	21,840.00
Investments in joint venture	5,775.00
Expenditure on construction work-in-progress	69,480.00
Proceeds from long-term borrowings	38,970.00
Proceeds from short-term borrowings	30,862.50
Opening cash and bank balances	11,032.50
Closing cash and bank balances	2,569.50

You are required to prepare the cash flow statement in accordance with IAS-3 for the year ended 31st March, 2016. (Make assumption wherever necessary).

**Solution :**

Cash flow Statement of Swastik Oils Ltd. for the year ended 31st March, 2016	(₹ lakhs)
(A) Cash flows from Operating Activities	
Net profit before taxation (37,500 + 7,500)	45,000.00
Adjustment for :	
Depreciation charged to P&L A/c	30,000.00

	Loss on sale of assets (net)	60.00
	Profit on sale of investments	(150.00)
	Interest income on investments	(3,759.00)
	Interest expenses	<u>15,000.00</u>
	Operating profit before working capital changes	86,151.00
	Increase (change) in working capital (excluding cash and bank balance)	<u>(84,112.50)</u>
	Cash generated from operations	2,038.50
	Income tax paid	<u>(6,372.00)</u>
	Net cash used in Operating Activities	(a) <u>(4,333.50)</u>
(B)	Cash flow from Investing Activities	
	Sale of assets (277.50 – 60.00)	217.50
	Sale of investments (41,647.50 + 150)	41,797.50
	Interest Income on investments (assumed)	3,759.00
	Purchase of fixed assets	(21,840.00)
	Investments in joint venture	<u>(5,775)</u>
	Expenditure on construction work-in-progress	<u>(69,480.00)</u>
	Net cash used in Investing Activities	(b) <u>(51,321.00)</u>
(C)	Cash flow from Financing Activities	
	Proceeds from long-term borrowings	38,970.00
	Proceeds from short-term borrowings	30,862.50
	Interest paid	(15,780.00)
	Dividends (including interim dividend paid)	<u>(12,000.00)</u>
	Net cash from Financing Activities	(c) <u>42,052.50</u>
	Net increase in cash and cash equivalents	(a) + (b) + (c) <u>(13,602.00)</u>
	Cash and cash equivalents at the beginning of the year	<u>11,032.50</u>
	Cash and cash equivalents at the end of the year	<u>2,569.50</u>

**Illustration 4.7 The following data is available from the books of Jupiter Ltd. :**

<b>Balance Sheet as on</b>	<b>31-3-2015</b>	<b>31-3-2016</b>
<b>Assets</b>		
Land and buildings	8,00,000	8,55,000
Furniture, fixtures and fittings	90,000	76,500

Stock	5,32,500	5,96,300
Debtors	1,87,300	1,84,200
Cash in hand	18,200	13,400
Cash at bank	1,15,200	1,62,000
Bills receivable	30,000	50,000
Advance payment of income-tax	2,55,000	2,70,000
Preliminary expenses	21,000	14,000
	<u>20,49,200</u>	<u>22,21,400</u>
<b>Liabilities</b>		
Equity share capital	10,00,000	11,00,000
Securities premium		30,000
General reserve	4,00,000	5,01,000
Bills payable	60,000	20,000
Creditors	2,07,200	1,57,400
Outstanding expenses	30,000	35,000
Provision for Income-tax	2,52,000	2,68,000
Proposed dividend	1,00,000	1,10,000
	<u>20,49,200</u>	<u>22,21,400</u>
<b>Profit and Loss Account for the year ended 31st March, 2016</b>		<b>₹</b>
Sales		46,37,200
Cost of goods sold		(37,21,200)
Gross profit		9,16,000
Sundry operating expenses		(3,17,500)
Depreciation on land and buildings		(45,000)
Depreciation on furniture, fixtures and fittings		(8,500)
Loss on disposal of furniture		(2,000)
Preliminary expenses amortised		(7,000)
Net profit before Income-tax		5,36,000
Provision for Income-tax		(2,68,000)
Net Profit after Income-tax		2,68,000
Provision for Income-tax (2014-2015)		(2,000)
Interim dividend		(55,000)
Proposed dividend		(1,10,000)



Transfer to general reserve	(1,01,000)
	Nil

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**Additional Information :**

**(i) Liability for income-tax for the accounting year 2014-2015 was fixed at Rs. 2,54,000 and hence, a refund of Rs. 1,000 was received out of the advance tax paid for that year.**

	₹
Balance on 31-3-2016	8,55,000
Add : Depreciation	<u>45,000</u>
	9,00,000
Less : Balance on 31-3--2015	<u>8,00,000</u>
Purchase of Land and Buildings	1,00,000

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**Cash flow statement of Jupiter Ltd. for the year ended 31-3-2016 (Direct Method)**

	₹
<b>Cash flows from Operating Activities</b>	
Cash receipts from customers	46,20,300
Cash paid to suppliers and employess	(41,87,300)
Cash flow from operations	4,33,000
Advance income tax paid (net)	<u>(2,69,000)</u>
Net Cash Inflow from Operating Activities	(a) <u>1,64,000</u>
<b>Cash flows from investing Activities</b>	
Purchase of land and building	(1,00,000)
Sale of furniture	<u>3,000</u>
Net Cash Outflow in Investing Activities	(b) <u>(97,000)</u>
<b>Cash flows from Financing Activities</b>	
Issue of equity shares at permium	1,30,000
Dividend paid (final)	(1,00,000)
Interim dividend paid	<u>(55,000)</u>
Net Cash Outflow in Financing Activities	(c) <u>(25,000)</u>
Net Increase in Cash and Cash equivalents during the period	(a) - (b) - (c) 42,000
Cash and Cash equivalents at the beginning	<u>1,33,400</u>
Cash and Cash equivalents at the end	1,75,400

**Illustration 4.8:** The Board of Director of Amit Ltd. was not able to decide

that why the Co. are not having adequate cash balance. The amount of profit of the company for the year 2003 was Rs. 90,000. This was highest amount as compared to previous years. You have been asked to prepare a Cash Flow Statement with the help of following information using direct method.

<b>Balance Sheet</b>					
(Rs. in thousands)					
<b>Liabilities</b>	<b>Dec.2002</b>	<b>Dec.2003</b>	<b>Assets</b>	<b>Dec.2002</b>	<b>Dec.2003</b>
Issue and paid up capital	1,575.00	1,575.00	Long term assts	1,125.00	2,047.50
Profit and Loss A/c	157.00	225.00	Closing stock	337.50	900.00
Mortgage Loan		900.00	Prepayments	45.00	90.00
Tax unpaid	22.50	67.50	Trade debtors	112.50	450.00
Trade creditors	315.00	877.50	Cash	450.00	157.50
	2,070.00	3,645.00		2,070.00	3,645.00

**Statement of Profit**  
(For the year ended Dec.2003)

<b>Particulars</b>	<b>Rs. ,000</b>	<b>Rs. ,000</b>
Sales		2,250.00
Opening stock	337.50	
Add. Purchases	2205.00	
	2,542.50	
Less Closing stock	900.00	1642.50
Gross profit		607.50
Less:		
Administrative expenses	247.50	
Depreciation	180.00	
Taxes (Provision)	90.00	517.50
Net Profit		90.00
Payment of dividends		22.50
		67.50
Add. Profit and loss a/c (Jan.2003)		157.50
Balance on Dec. 2003		225.00

You are also informed that a new building was purchased on 15<sup>th</sup> June 2003 for Rs. 11,02,500.

**Solution:**

<b>Cash Flow Statement</b>		
(For the year ended 31st Dec.2003)		
<b>Particulars</b>	<b>Rs. ,000</b>	<b>Rs. ,000</b>
<b>Cash Flow from Operating Activities</b>		
Cash Received from Customers (Note-1)	1,912.50	
Cash Paid to Suppliers and Employees (Note-2)	(1,935.00)	
Cash generated from Operating Activities	(22.50)	
Income Tax Paid (Note-3)	(45.00)	
Net Cash Used in Operating Activities		(67.50)
<b>Cash Flow from Investing Activities</b>		
Purchase of New Building	(1,102.50)	
Net Cash Used in Investing Activities		(1,102.50)
<b>Cash Flow from Financing Activities</b>		
Raising of Mortgage Loan	900.00	
Dividend Paid	(22.50)	
Net Cash Provided by Financing Activities		877.50
Net decrease in cash and cash equivalent		(292.50)
Opening balance of cash		450.00
Closing balance of cash		157.50

**Working Notes:**

Calculation of cash received from customers:	
Sales for the year as per the statement	2,250.00
Add: Trade debtors in the beginning	112.50
	2362.50

Less: Trade debtors at the end	450.00
Cash received from customers	1912.50
2. Calculation of cash paid to suppliers and employees:	
Purchase for the year as per the statement of profit	2,205.00
Add: Trade creditors in the begging	315.00
	2520.00
Less: Trade creditors at the end	877.50
Cash paid to creditors for purchase of goods (A)	1642.50
Administrative expenses as per the statement of profit	247.50
Add: Prepaid exp. at the end	90.00
	337.50
Less: Prepaid Exp. In the begging	45.00
Cash paid for services (B)	292.50
Cash paid to suppliers and employees (A+B)	1,935.00
<b>3. Calculation of tax paid:</b>	
Opening balance of tax unpaid	22.50
Add: Provision made during the year	90.00
	112.50
Less: Closing balance of tax unpaid	67.50
Tax paid during the year	45.00

**1. Indirect Method:** Under the indirect method, the net cash flow from operating activities is determined by adjusting net profit or loss for the effect of:

- a. Non cash items such as depreciation, provision, deferred taxes and

unrealized foreign exchange gains and losses

- b. Changes during the period in inventories and operating receivables and payables.
- c. All other items for which cash effects are investing or financing flows. The indirect method is also called the reconciliation method as it involves reconciliation of net profit or loss as given in the profit and net cash flow from operating activities as shown in the cash flow statement. Cash flow from operating activities by using the indirect method can be calculated as follows:

---

Net Profit before Tax and Extraordinary Items	XXX
Add: Non-cash and non-operating items, which have already been Debited to P/L A/c;	
Depreciation	
Transfer to reserve and provisions	
Goodwill written off	
Preliminary expenses written off	
Other intangible assets written off just as discount or loss on issue of Shares, debentures and underwriting commission	
Loss on disposal of fixed assets	
Loss on sale of investment	
Foreign exchange loss	XXX
	<hr/>
	XXX
Less: Non-cash and non-operating items, which have already been Credited to P/L A/c	
Gain on the sale of fixed assets	
Profit on sale of investment	

Income from interest or dividend	
Appreciation in values of fixed assets	
Reserve written back	
Foreign exchange gains	(XXX)
<hr/>	
Operating profit before adjustment of working capital	XXX
changes	
Adjustment for changes in current operating assets and liabilities:	
Add: Decrease in accounts of current assets (except cash and cash equivalents)	XXX
Add: Increase in accounts of current operating liabilities (except Bank overdraft)	XXX
Less: Increase in accounts of current assets	(XXX)
Less: Decrease in accounts of current liabilities	(XXX)
<hr/>	
Cash generated from operation before tax	
XXX	
Less: Tax paid	(XXX)
<hr/>	
Cash flow before extra-ordinary items	XXX
Add/Less: Extra-ordinary items	XXX
Net cash flow from operating activities	XXX

Let us take an example to clear the above points.

**Illustration 4.9:** The following are the comparative Balance Sheet of Ashish Ltd. as on 31<sup>st</sup> Dec.2003 and 2004.

<b>Balance Sheet</b>					
<b>Liabilities</b>	<b>2003</b>	<b>2004</b>	<b>Assets</b>	<b>2003</b>	<b>2004</b>
Share capital					
(share 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	Stock	2,46,000	2,13,500
9% Debentures	60,000	30,000	Goodwill	50,000	25,000
Creditors	51,600	59,200	Cash & Bank	42,000	35,000
			Temporary	3,000	4,000
			Investment		
			Debtors	71,000	84,500
	5,12,000	5,12,000		5,12,000	5,12,000

Other particulars provided to you are: A) Dividend declared and paid during the year Rs.17,500 B) Land was revaluated during the year at Rs. 1,50,000 and profit on the revaluation transferred to P/L A/c. you are required to prepare a cash flow statement for the year ended 31/12/04.

**Solution:**

<b>Cash Flow Statement</b>		
<b>(for the year ended 31st Dec.2004)</b>		
<b>Particulars</b>	<b>Rs.</b>	<b>Rs.</b>
<b>Cash Flow from Operating Activities</b>		
Increase in the balance of P/L A/c	2,400	
Adjustment 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)	
Adjustment for changes in current operating assets and liabilities:		
Increase in creditors	7,600	
Decreases in stock	32,500	
Increase in debtors	(13,500)	
Cash generated from operating activities	21,500	
Income tax paid		
Cash flow from extra ordinary items		
Net cash flow from operating activities		21,500
<b>Cash flow from investing activities</b>	-----	-----
<b>Cash flow from financing activities</b>		
Proceeds from 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 equivalent		(6,000)
Cash and cash equivalent at the beginning of the year		45,000
Cash and cash equivalent at the end of the year		39,000

#### 4.12. Preparation of Cash Budget

This budget represents the anticipated receipts and payment of cash during the budget period. The cash budget also called as Functional Budget. Cash budget is the most important of the entire functional budget because, cash is required for the purpose to meeting its current cash obligations. If at any time, a concern fails to meet its obligations, it will be technically insolvent. Therefore, this budget is prepared



on the basis of detailed cash receipts and cash payments. The estimated cash receipts include: cash sales, credit sales, collection from sundry debtors, bills receivable, interest received, income from sale of investment, commission received, dividend received and income from non-trading operations etc.

The estimated cash payments include the following:

1. Cash purchase
2. Payment to creditors
3. Payment of wages
4. Payments related to production expenses
5. Payments related to office and administrative expenses
6. Payments related to selling and distribution expenses
7. Any other payments related to revenue and capital expenditure
8. Income tax payable, dividend payable etc.

**Illustration 4.10.** Prasad and Co. wishes to prepare cash budget from January. Prepare a cash budget for the first six months from the following estimated revenue and expenses:

Month	Total sales (Rs.)	Materials (Rs.)	Wages (Rs.)	Production overheads (Rs.)	Selling and distribution overheads (Rs.)
January	10,000	10,000	2,00	1,600	400
February	11,000	7,000	2,200	1,650	450
March	14,000	7,000	2,300	1,700	450
April	18,000	11,000	2,300	1,750	500
May	15,000	10,000	2,000	1,600	450
June	20,000	12,500	2,500	1,800	600

**Additional information**

1. Cash balance on 1<sup>st</sup> January was Rs. 5,000. New machinery is to be installed at Rs. 10,000 on credit, to be repaid by two equal instalments in March and April.
2. Sales commission @ 5% on total sales is to be paid within a month of following actual sales.
3. Rs. 5,000 being the amount of 2<sup>nd</sup> call may be received in March. Share Premium amounting to Rs. 1,000 is also obtainable with the 2<sup>nd</sup> call.
4. Period of credit allowed by suppliers- 2 months.
5. Period of credit allowed to customers- 1 month.
6. Delay in payment of overheads- 1 month.
7. Delay in payment of wages- ½ month.
8. Assume cash sales to be 50% of total sales.

**Solution.**

<b>Cash Budget from January to June</b>						
<b>Particulars</b>	<b>January (Rs.)</b>	<b>February (Rs.)</b>	<b>March (Rs.)</b>	<b>April (Rs.)</b>	<b>May (Rs.)</b>	<b>June (Rs.)</b>
Opening balance	5,000	9,000	14,900	13,500	12,350	16,550
<b>Estimated cash receipts:</b>						
Cash sales	5,000	5,500	7,000	9,000	7,500	10,000
Credit sales	-	5,000	5,500	7,000	9,000	7,500
Second call	-	-	5,000	-	-	-
Share premium	-	-	1,000	-	-	-
Total cash Receipts (A)	10,000	19,500	33,400	29,500	28,850	34,050

<b>Estimated cash payments:</b>						
Materials	-	-	10,000	7,000	7,000	11,000
Wages	1,000	2,100	2,250	2,300	2,150	2,250
Production Overheads	-	1,600	1,650	1,700	1,750	1,600
Selling & Distribution overheads	-	400	450	450	500	450
Sales commission	-	500	550	700	900	750
Purchase of machinery	-	-	5,000	5,000	-	-
Total cash Payment (B)	1,000	4,600	19,900	17,150	12,300	16,050
Closing balance (A – B)	9,000	14,900	13,500	12,350	16,550	18,000

**Illustration 4.11.** From the following data, forecast the cash position at the end of April, May and June 2005.

<b>Month</b>	<b>Sales (Rs.)</b>	<b>Purchase (Rs.)</b>	<b>Wages (Rs.)</b>	<b>Miscellaneous (Rs.)</b>
February	60,000	42,000	5,000	3,500
March	65,000	50,000	6,000	4,000
April	40,000	52,000	4,000	3,000
May	58,000	53,000	5,000	6,000
June	44,000	40,000	4,000	3,000

**Additional information:**

1. Sales: 10% realized in the month of sales; balance realised equally in two subsequent months.
2. Purchases: These are paid in the month following the month of supply.
3. Wages: 10% paid in arrears following month.

4. Miscellaneous expenses: Paid a month in arrears.
5. Rent: Rs. 500 per month paid quarterly in advance due in April.
6. Income tax: First instalment of advance tax Rs. 15,000 due on or before 15<sup>th</sup> June.
7. Income from investment: Rs. 3,000 received quarterly in April, July etc.
8. Cash in hand: Rs. 3,000 on 1<sup>st</sup> April 2005.

**Solution.**

**Cash budget for the month of April, May and June**

Particulars	April (Rs.)	May (Rs.)	June (Rs.)
Opening balance of cash	3,000	7,550	700
Add : Cash receipts:			
Cash sales	4,000	5,800	4,400
Receipts from debtors (Credit Sales)			
Collection in 1 <sup>st</sup> month	29,250	18,000	19,800
Collection in 2 <sup>nd</sup> month	27,000	29,250	18,000
Income from investment	3,000	-	-
Total cash receipts (1)	66,250	60,600	42,900
Less : Cash payments:			
Creditors for purchases	50,000	52,000	53,000
Wages: Current (90%)	3,600	4,500	3,600
Arrears (10%)	600	400	500
Rent	500	-	-
Miscellaneous expenses	4,000	3,000	6,000
Income tax	-	-	15,000
Total payments (2)	58,700	59,900	78,100
Closing balance of cash (1-2)	7,550	700	(-) 35,200

**Working notes:**

1. Out of total sales, 10% are cash sales. Balance 90% is credit sales. In any given month 50% of credit sale of the previous two months are collected (See W.N.).
2. In any given month, 90% of the wages of the same month and 10% of previous month's wages are paid.
3. **Working notes for collection of cash from debtors and sales**

<b>Particulars</b>	<b>February (Rs.)</b>	<b>March (Rs.)</b>	<b>April (Rs.)</b>	<b>May (Rs.)</b>	<b>June (Rs.)</b>
Total sales	60,000	65,000	40,000	58,000	44,000
Less: Cash sales (10%)	6,000	6,500	4,000	5,800	4,400
Credit sales	54,000	58,500	36,000	52,200	39,600
Collection in 1 <sup>st</sup> month after credit sales	-	27,000	29,250	18,000	19,800
Collection in 2 <sup>nd</sup> month after credit sales	-	-	27,000	29,250	18,000
Total credit	-	-	56,250	47,250	37,800

**4.13. SUMMARY**

Based on the conducted analysis it can be concluded that the traditional cash flow analysis is limited to the vertical analysis of net cash flow from three levels of activities and, more rarely, to ratio analysis based on these three net cash flows. Such an analysis can lead to erroneous conclusions about the company due to: – high volatility of net cash flow from operating, investing and financing activities; – different nature of the factors affecting the net cash flow (continuous and recurring events or one-time events) – postponement of payments separated from the time in which revenues and expenses are recorded (accordance with the accrual basis principle). The analysis of the most important part of the cash flow statement, i.e.

cash flow from operating activity, should be deepened especially to identify and alternatively eliminate the influence of: – changes in working capital, – taxes, – one-off events, in particular non-operating transactions, effecting the difference between net income and cash flow from operating activity. The analysis of investing activity should be made separately for capital expenditures (purchase or sell out fixed assets) and for speculative investments. Then the analysis of the financial part of the cash flow statement should be made separately for equity and debt.

#### **4.14 GLOSSARY**

**Cash Flow:** The total amount of money being transferred into and out of a business, especially as affecting liquidity.

**Fund flow:** It is the net of all cash inflows and outflows in and out of various financial assets. Fund flow is usually measured on a monthly or quarterly basis.

**Budget:** .An estimate of income and expenditure for a set period of time.

#### **4.15 SELF ASSESSMENT QUESTIONS**

1. Difference between fund flow and cash flow statement.
2. What are the uses of preparing a cash flow statement.
3. Explain the procedure preparing cash flow statement with the help of a hypothetical example.
4. How Budgets are different from forecasts ?
5. Define Budget and its features.
6. Classify the following into cash flows from operating activities investing activities financing activities (a) Cash sale of goods (b) Cash paid to suppliers of raw material (c) Cash payments of salaries and wages to employees. (d) Cash payment to acquire fixed assets (e) Cash proceeds from issues of shares at premium. (f) Payment of dividend (g) Interest received on investment (h) Interest on debenture (i) Payment of income tax (j) Cash payment of a long term loan.

7. The net Income reported in the Income Statement for the year was Rs. 110,000 and depreciation of fixed assets for the year was Rs. 44000. The balances of the current assets and current liabilities at the beginning and end of the year are as follows. Calculate cash from operating activities.

	<b>End of the year Amount (Rs)</b>	<b>Beginning of the year Amount (Rs)</b>
Current Items		
Cash	130,000	140,000
Debtors	200,000	180,000
Inventories	290,000	300,000
Prepaid expenses	15,000	16,000
Account payables	102,000	1,16,000

8. From the following information calculate the cash flow from investing activities

<b>Particulars</b>	<b>Opening</b>	<b>Closing</b>
Machinery (at cost)	400,000	420,000
Accumulated Depreciation	100,000	110,000
Patents	280,000	160,000

Additional Information: (i) During the year a machine costing Rs 40,000 with this accumulated depreciation Rs 24000 was sold for Rs 20,000 (ii) Patents were written off to the extent of Rs 40,000 and some patents were sold at a profit of Rs 20,000

9. From the following forecasts of income and expenditure, prepare a cash budget for the months Jan. to April 2011.

Months	Sales (Credit)	Purchase (Credit)	Wages	Manufacturing Expenses	Administrative Expenses	Selling Expenses
2010 Nov.	30000	15000	3000	1150	1060	500
Dec	35000	20000	3200	1225	1040	550
2011 Jan	25000	15000	2500	990	1100	600
Feb.	30000	20000	3000	1050	1150	620
March	35000	22500	2400	1100	1220	570
April	40000	25000	2600	1200	1180	710

**Additional information as follows :**

1. The customers are allowed a credit period of two months.
2. A dividend of \$ 10000 is payable April.
3. Capital expenditure which has to be incurred : 15th Jan. \$ 5000, we will buy a plant and in March, we will buy a building on loan and its payment will be done with in monthly instalments of \$ 2000 each.
4. The creditor are allowing a credit of 2 months.
5. Wages are paid on the 1st of the next months.
6. Lag in payment of other expenses is one month.
7. Balance of cash in hand on 1st Jan. 2011 is \$ 15000.

**10. From the following information prepare a cash budget for the months of June and July.**

Month	Credit Sales Rs.	Credit Purchase Rs.	Manufacturing Overheads Rs.	Selling Overheads Rs.
April	80,000	60,000	20,000	3,000
May	84,000	64,000	2,400	2,800
June	90,000	66,000	2,600	2,800
July	84,000	64,000	2,000	2,600



### **Additional Information**

1. Advance tax of Rs. 4,000 payable in June and in December 1994.
2. Credit period allowed to debtors is two months.
3. Credit period allowed by the vendors or suppliers
4. Delay in the payment of other expenses one month.
5. Opening balance of cash on 1st June is estimated as Rs. 20,000.

**11. From the estimates of incomes and expenditure, prepare cash budget for the months from April to June.**

<b>Month</b>	<b>Sales Rs</b>	<b>Purchases Rs</b>	<b>Wages Rs</b>	<b>Office Exp. Rs</b>	<b>Selling Exp. Rs</b>
Feb	1,20,000	80,000	8,000	5,000	3,600
Mar	1,24,000	76,000	8,400	5,600	4,000
Apr	1,30,000	78,000	8,800	5,400	4,400
May	1,22,000	72,000	9,000	5,600	4,200
June	1,20,000	76,000	9,000	5,200	3,800

1. Plant worth Rs. 20,000 purchase in June 25% payable immediately and the remaining in two equal instalments in the subsequent month.
2. Advance payment of tax payable in Jan and April Rs 6,000
3. Period of credit allowed
  - By suppliers 2 months
  - To customers 1 month
4. Dividend payable Rs. 10,000 in the month of June
5. Delay in payment of wages and office expenses 1 month and selling expenses ½ month. Expected cash balance on 1st April is Rs. 40,000.

#### **4.16. SUGGESTED READINGS**

1. Sharma, R.K. & Gupta, Shashi K., Management Accounting, Kalyani Publication, New Delhi.
2. Horngren & Sundem, Introduction to Management Accounting, Prentice Hall of India, N.Delhi.
3. Anthony R.N. and Reece J.S., Management Accounting Principles, 6<sup>th</sup> ed., Homewood, Illinois, Richard D.Irwin, 1995.
4. Hansen & Mowen, Management Accounting, Thomson Learning, Bombay.
5. Anthony Robert and Hawkins David, Accounting: Text & Cases, McGraw Hill, 1999
6. Jain, S.P and Narang, K.L., Advanced Cost Accounting, Kalyani Publishers, Ludhiana.

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