SHIVAJI UNIVERSITY, KOLHAPUR

CENTRE FOR DISTANCE AND ONLINE EDUCATION

M. Com. Part-II

Semester-III :

Advanced Accountancy Paper-XI (DSC-11) (MMA-XI)

Financial Management - Controlling and Decision Making

(In accordance with National Education Policy 2020)
(Implemented from the Academic Year 2024-25)

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Preface

Financial management is a crucial aspect of any organization that involves strategic planning, organizing, directing, and controlling financial resources to achieve specific objectives. It compasses various activities such as budgeting, forecasting, cash flow management, investment decisions, and risk management. The primary goal is to maximize shareholder wealth while ensuring the organization's long-term sustainability and growth. By effectively managing finances, organizations can ensure stability, foster growth, and maximize shareholder value. Controlling and decision making are two essential functions in management that significantly influence an organization's effectiveness and efficiency. Controlling involves monitoring performance, comparing it with established standards, and taking corrective action when necessary. While decision making is the process of identifying problems, evaluating alternatives and making choices to achieve specific organizational objectives. Both controlling and decision-making are interdependent processes that contribute significantly to an organization's success. By ensuring that decisions are based on accurate performance data and aligning actions with strategic goals, organization can navigate challenges effectively and achieve their objectives efficiently.

This book is divided into four unites budgetary control, marginal costing, standard costing and price level changes or inflation and financial management. The first unit consist of meaning and objectives of budgetary control, budgetary control as management or decision-making tool, advantages and limitations of budgetary control, forecast and budget, installation of budgetary control system, classification or types of budgets and preparation of budgets. The second unit includes meaning and features of marginal costing, merits and demerits of marginal costing, marginal costing and absorption costing; marginal costing, direct costing and differential costing; break even analysis, advantages and limitations of break-even analysis, cost volume profit analysis, decision making by using marginal costing and practical problems. The third unit covers meaning and characteristics of standard costing; advantages and limitations of standard costing; variances, material variances, wages or labour variances, overhead variances and sales variances etc. The fourth unit includes meaning and relevance of price level changes or inflation accounting; objectives, features of inflation accounting, limitations of historical accounting, inflation and financial decisions, accounting for price level changes, Current Purchasing power method and Current cost accounting method and preparation of accounts under Current Cost Accounting Method.

We are thankful to Hon. Vice-Chancellor Prof. (Dr.) D. T. Shirke, Hon. Pro-Vice-Chancellor Prof. (Dr.) P. S. Patil, Registrar Dr. V. N. Shinde and Director, Centre for Distance and Online Education, Shivaji University for giving us an opportunity to come out with this book. We are sure this book will be useful to students for their accomplishment of getting knowledge and completing their course at M. Com. programme. The suggestions regarding this book are welcome from all corners of the stakeholders.

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Syllabus of M.Com

Faculty of Commerce and Management

Syllabus in accordance with NEP 2020

Introduced from AcademicYear 2024- 2025 M.Com–II Semester-III

Title of Paper – Advanced Accountancy-Paper XI (DSC-11) (MMA-XI)

Financial Management-Controlling and Decision Making

Course Outcomes

After Studying this course, students shall be ableto:

1. Under stand preparation of budgets and exercising budgetary control
2. Take pricing and profit decisions under various situations using CVP Analysis.
3. Establish standard cost for eachelement of cost and exercise control on cost.
4. Understand the significance of price level changes and its accounting.

Total 60 Hours 4Credits

Unit	Contents	No.of Hours
I	**Budgetary ControlTheory**- Meaning of Budget and Budgetary Control, Budgetary Control as a Managementor Decision Making Tool, Limitations of Budgetary Control, Foreca stand Budget, Installation of Budgetary Control System, Classification of Budgets, practical problems on all types of budgets.	15
	Practical-a) Orgnise Debate onBenefitsand drawbacksofBudgets.Record the entire debating	
II	**Marginal Costing and Cost Volume Profit AnalysisTheory**- Meaning of Marginal Cost and Marginal Costing, Marginal Costing and Absorption Costing, Marginal Costing and Direct Costing, Marginal Costing and Differential costing, Profit Planning, Cost Volume Profit Analysis and Break EvenAnalysis– Assumptions, Advantages and Limitations, Advancepractical problems on various decision making basedon contribution, BEP,P/VRatio,AI(including chart/ graph).	15
	Practical– Collect data from any manufacturing company and adv is ethemonthe basis of CVP Analysis on various issues.	
III	**Standard Costing and Variance AnalysisTheory**- Standard Cost and Standard Costing, Preliminaries to the establishment of standard cost, Analysis of Variances – Material, Labour and Overhead Variances, Sales Variances, Profit and Loss Variances, Advantages and Limitations of Standard Costing. Advance practical problems.	15
	Practical-Collect data from any manufacturing company and calculate the variances.	
IV	**Price Level Changes or Inflation and Financial ManagementTheory**- Meaning	

and Relevance of Inflation, limitations of historical accounting, Inflation and Financial Decisions, Accounting for Price Level Changes – Methods – Practical Problems. 15

Practical–Organise group discussion of students on price level changes and in flation.

References

1. Dr.S.N.Maheshwari,Financial Management Principles and Practice, Sultan Chand & Sons, Educational Publishers, New Delhi.
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Shivaji University, Kolhapur

Nature of Question Paper M.Com–II Semester- III

Advanced Accountancy -Paper XI (DSC-11)(MMA-XI)

Financial Management–Controlling and Decision Making

Duration: 3hours Marks:80.

Instructions:

1. Question number 1 and 2 are compulsory
2. Attempt any three questions from question number 3 to 6
3. Use of Calculator is allowed

Q.1	a.	Choose the appropriate alternative	(10)
	b.	True or false	(6)
Q.2	Short Notes (any 4out of 6)		(16)
Q.3	Practical Problem		(16)
Q.4	Practical Problem		(16)
Q.5	Practical Problem		(16)
Q.6.	a.	Short problem	(8)
	b.	Short Problem	(8)

(Theory questions 40% and Practical questions 60%)

M. Com Part-II

Semester III

FINANCIAL MANAGEMENT - CONTROLLING AND DECISION MAKING

INDEX

Each Unit begins with the section objectives -

Objectives are directive and indicative of :

1. what has been presented in the unit and
2. what is expected from you
3. what you are expected to know pertaining to the specific unit, once you have completed working on the unit.

The self check exercises with possible answers will help you understand the unit in the right perspective. Go through the possible answers only after you write your answers. These exercises are not to be submitted to us for evaluation. They have been provided to you as study tools to keep you in the right track as you study the unit.

Dear Students

The SLM is simply a supporting material for the study of this paper. It is also advised to see the syllabus for 2024-25 and study the reference books & other related material for the detailed study of the paper.

Unit-1

Budgetary Control

Index

1.0 Objectives

After studying this unit, you should be able to:

1. To understand meaning of budget and budgetary control
2. To know budgetary control as a tool of decision making and limitations
3. To know budget and forecast as well installation of budgetary control system
4. To learn classification of budgets with practical problems.

1.1 Introduction

Budget is a tool in the hands of management which helps in the prediction of future. Management always tries to maximise profit by adopting various tools and techniques in its business operations. Budgetary control is one of them. The budgets are prepared with the help of data available by way of cost and financial record, using marginal costing and other tools. Each activity is budgeted with keeping in mind the expected result and the performance is compared with. Thus, it helps management to come to a concrete conclusion, that leads to judge future performance more accurately, by controlling and eliminating unnecessary activities. There are two types of control-budgetary and financial. Present chapter deals with budget, forecast as well installation of budgetary control system and classification of budgets.

budgetary control only.

1.2 Presentation of Subject Matter

1.2.1 Meaning of Budget

Budgeting is a systematic approach to attain the effective management performance. It is an integral part of the management. The budget regulates flow of fund. It involves preparation of a plan relating to the future activities. The term budget can be defined in a more specific way as under.

"A budget is comprehensive and co-ordinated plan, expressed in financial terms, for the operations and resources of an enterprise for some specific period in the future."

Thus, the term budget refers to-

a) integrated plan that reduces uncertainty,

b) expression of activities in financial terms,

c) planning of an organisation's operations and resources; and

d) future plan of action of an organisation for a specific period of time.

1.2.2 Meaning of Budgetary Control

Budgetary control is the process of setting standards and then comparing it with the actual performance for calculating variances, if any. This enables the management to find out discrepancies and take remedial measures at a proper time.

The budgetary control is a continuous process which helps in planning and co-ordination. It provides a method of control too. A budget is a means and budgetary control is the end-result.

Thus, the term budgetary control refers to exercise control for execution of budget. It is used as a system of planning and controlling the production and sale of goods and services. Thereby, the performance of an organisation can be evaluated to see whether the goals of an organisation have been achieved or not and to take corrective actions, if necessary.

The Institute of Cost and Management Accountants (ICMA), London has defined the term budgetary control as-

"The establishment of budgets relating to responsibilities of executives to requirements of a policy and the continuous comparison of actual with budgeted results, either to secure by individual action the objective of the policy or to provide a basis for its revision."

Thus, the term budgetary control refers to-

a) Comparison of actual results with budgets

b) Find out variations, if any, in the budgeted and actual results.

c) Fix the responsibility of a key persons who can exercise control action or revises the original budget.

In short, the budgetary control is a management control system in which actual income and expenses are compared with the planned income and expenses, the actual output is compared with planned output and actual profit with planned profit in order to see whether the activities are being carried out as per the plans, whether there are any deviations and how those deviations can be eliminated.

1.2.3 Objectives of Budgetary Control:

The fundamental objective of budgetary control is to maximise the use of given resources in order to achieve the goal of an organisation. The aim of the budgetary control is to enable management to carry out basic functions of planning, co-ordinating and controlling all the functions of an organisation smoothly and efficiently. Thus, the objectives of budgetary control can be expressed in terms of planning, co-ordination and control.

(a) Planning – A budget is detailed plan of action prepared well in advance. It provides directions to employees that reduces ambiguity and uncertainty. It makes way of action clear that enables all concerned (the employees and management) in performing efficiently their work relating to the production, sales, advertising, inventory, finance, etc.

(b) Co-ordination – Co-ordination implies establishment of proper balance between man, material and machinery. More specifically, co-ordination refers to keep the activities of all departments in harmony with each other. e.g., Purchase department must purchase raw material of a quality requested by production department in required quality and quantity at required time so as to produce desired product of a desired quality in desired quantity. The sales department must create demand for the produced goods and services and sell them in time.

(c) Communication – Budgeting is a vehicle to communicate goals of an organisation to its employees. A clear and written communication of goals through budget enables employees to understand, support and accomplish the goals of an organisation.

(d) Control – It is necessary to observe control over activities in order to achieve the set goals through budgets. The control ensures planned efforts directed towards common goal of an organisation. The budget enables comparison of actual performance with the budgeted one. This discloses whether employees are performing to the extent expected at or not. It also evaluates variation in performance, the causes thereof and the responsibility. Once causes and responsibility of variations between actual and budgeted performance have been identified, a corrective action can be initiated to avoid recurrence of variations in future.

(e) Preparedness – The budgeting ensures availability of required resources in required quality on proper time. It readily brings to the notice of concerned, well in advance, what are the goals and what actions are required to achieve these goals. Thus, budget makes organisation ready in all respects to perform as per pre-determined line of action.

(f) Avoids Duplication & Conflicts – Budgetary Control helps avoid duplication of efforts and conflicts between departments.

1.2.4 Budgetary control as a management or decision making tool

Budgeting is a forward planning. It serves basically as a tool for management control; it is rather a pivot of any effective scheme of control. Budgetary control plays an important role in decision making by providing financial information, evaluating alternatives, and assessing the impact of decisions on organizational goals. Budgetary control has some ways in in the hands of management which budgetary control influences decision making:

1. **Investment Decisions**:

Budgetary control assesses the financial viability and potential returns of investment proposals. It compares the expected cash flows, payback period, and return on investment against the budgetary targets. The organizations can make informed decisions about capital investments.

2. **Cost Control and Cost-Benefit Analysis:**

Budgetary control is a tool in the hands of management which control costs and evaluate the cost-effectiveness of various alternatives. It also compares the costs and benefits of different options. It helps in effective cost control by avoiding possible constraints.

3. **Pricing Decisions:**

It provides insights into the cost structure, breakeven points, and profitability of products or services. It helps the organization to make pricing decisions which balance customer value, market competitiveness and financial goals.

4. **Resource Allocation:**

Budgetary control is a tool or technique in optimizing resource allocation by identifying the most profitable or strategic uses of resources. It evaluates the financial impact of different resource allocation of organization.

5. **Performance Evaluation and Rewards:**

Budgetary control is the basis for evaluating individual and departmental performance. It helps in analyzing actual performance against budgeted targets. It helps the organization to get proper feedback for improvement.

6. **Risk Management**:

Budgetary control helps in assessing the financial risks which is associated with different decisions related to the organization. Budgetary control helps in making decision to mitigate risks and ensure financial stability by considering the potential impact on budgets, cash flows, or profitability.

7. **Strategic Planning:**

Budgetary control is an integral part of the strategic planning process. It aligning budgets with strategic objectives, or goals. The organizations can make decisions which enables their long-term growth and sustainability. Budgetary control serves a mechanism for monitoring progress towards strategic goals and make the adjustments as per the requirements.

1.2.5 Advantages of Budgetary Control

There are several advantages of budgetary control.

1. **Planned and Forced Efforts** -The budgetary control compels and motivate management to think well in advance about future and to set detailed plan of action for each department, activity and each manager. This ensures planned efforts towards every activity that leads towards better performance.
2. **It Promotes Co-ordination and Communication**- The budgets of different departments have a bearing on one another. Therefore, working of all departments and sections is properly coordinated. Proper co-ordination and communication ensure smooth functioning of each department, process and activity that lead towards achievement of organizational goals.
3. **Reduction in Uncertainty-**Budgetary control fixes responsibility centers in the process of achievement of budgeted targets. This makes respective centers and concerned employees fully aware of their course of action that reduces uncertainty to a great extent.
4. **Better Performance Appraisal**- It provides basis for performance appraisal through analysis of variations in performance. As the budgets are pre-determined targets that are to be compared with actual performance, the detailed analysis can be made regarding variations in the performance. The variations can be further classified into controllable and uncontrollable that enables

remedial action to minimise those variations in future. This also motivates employees to participate in determination of goals and ensures their full co-operation in the performance.

5. **Ensures Full Utilisation of Resources-** The budgetary control ensures prompt allocation and full utilisation of available resources.
6. **Effective Management Control-** Budget co-ordinates and correlates all business activities that enables effective management control over all business activities.
7. **Cost Consciousness**- Budgeting develops cost consciousness among all employees that stimulates them to use all available resources effectively.
8. **Increase in Productivity-** Budgeting makes aware employees of their duties and responsibilities and compels them to give best performance. This automatically increases productivity of each employee and that of organisation as a whole.
9. **Maximization of Profits:** The budgetary control aims at the maximization of profits of the enterprise. A proper planning and co-ordination of different functions is undertaken in order to achieve this goal. A proper control over various capital and revenue expenditures is observed. The resources are put to the best possible use.
10. **Corrective Action-**Budgeting provides a systematic approach to the solution of the problems of the organisation.
11. **Saving in Time-** Budgeting saves management time by planning each and every activity.
12. **Tool of Controlling**- It is an effective tool of controlling all activities of the organisation.
13. **Basis of Standard-** Budgets sets basis for standard costing.
14. **Introduction of Incentive Schemes:** Budgetary control system enables the introduction of incentive schemes of remuneration for better performance. The comparison of budgeted and actual performance will enable the use of such schemes.

1.2.6 Limitations of Budgetary Control

Though the budgetary control is beneficial to an organisation, it has some limitations which are explained below.

1. **Based on Estimates –** The budgets are prepared on the basis of forecast and estimates which cannot be proved cent percent correct. Therefore, accuracy of budgets depends upon the accuracy of estimates.
2. **Lack of Flexibility –** The budget is prepared on the basis of prediction related to future environment. However, actual environment may differ from predicted one. This creates conflicts between budgeted action and that planned. Thus, the budgets must have some flexibility.
3. **Pressure on Employees –**Budgets can be seen as pressure on employees that may disturb relationship between management and employees. This may lead to poor performance on the part of employees.
4. **Departmental Conflicts –** When the budgeted targets are not achieved, the departments blame each other that create departmental conflicts. There may arise disputes over resource allocation.
5. **Misleading analysis of performance** - There are possibilities of under or over estimation that leads to misleading analysis of performance.

1.2.7 Forecast and Budget:

A forecast is an estimate of getting something in future. Before plan of any activity, the management has to forecast the input and output of the business. A budget is a quantified expectation which is used for planning and performance measurement purposes. Every business has to maintain its overall activities on the basis futuristic goals, hence the management has to prepare a plan or budget for acquiring required assets to the business.

The terms budgeting and forecasting are used interchangeably as they are having similarities. Budgeting and forecasting are the process made for future activities. It involves prediction for future business goal or objectives. Forecasting is the core part of budgeting. Without forecasting, to determine budgeting of any item, is not possible. A budget is a formal monetary plan of action.

According to National Association of Accountants(USA), “Forecasting is the process of predicting or estimating a future happening”.

On the other hand, According to Chartered Institute of Management Accountants (CIMA) UK, a budget is “A plan quantified in monetary terms prepared and approved prior to a defined period of time, usually showing planned income to be generated and, expenditure to be incurred during the period and the capital to be employed to attain a given objective.”

Basically, forecast is made of certain items of income and expenditures of business and not of financial performance though cash flows may be forecasted. It is updated short term operational consideration at regular intervals like monthly or quarterly. It can not compare to actual results as there is no variance analysis.

On the other hand, budget is a detailed representation of the future results, financial position, and cash flows during a certain period of time. It is updated only once in a year as the changes may depend on management. The budget is compared to actual results to determine variances from expected performance.

1.2.8 Installation of budgetary control system:

Following are the key points involve in the installation of budgetary control system:

1. **Top Management Support:** The approval of installation or implementation is required from top management to ensure that budgetary control becomes an integral part of the organization’s culture.
2. **Budgeting Guidelines:** the budgeting guidelines and procedure should be very clear in case of preparation, review, and approval of any budget presented before the management. It makes easy to define responsibilities and roles for different organisational departments.
3. **Budgeting Software:** it is now necessary to install accounting software for business performance, as similar to this the budgeting software is required to streamline the process. It helps in improving accuracy, and facilitating data analysis.

4. **Training and Communication:** the training is needed to establish budgetary control system and provide its benefits. Effective communication is required from all levels of the organization to achieve budgetary goal.
5. **Periodic Review:** it is necessary a regular review and revise budgets to do changes in business conditions to achieve with strategic goals.
6. **Performance Evaluation:** it is necessary to install budgetary control to monitor actual performance against budgeted figures and analyze variances related to various departments of organisation. This helps to use such information to make decisions to take corrective actions.
7. **Continuous Improvement:** the budgetary control system can be improved with hi-technology if the budgetary control system is continuously updated with proper feedback.

1.2.9 Classification/ Types of Budgets

All organisations make plans, some in systematic and formal way whereas, others in informal way. Each one adopts different practices. The large organisations prepare budget for all important operations. Whereas, small and medium organisations prepare budgets for few of their operations. Some of the organisations prepare budget for short period, whereas others prepare it for long period. From this view point the budgets can be classified as under.

(A) Functional Budgets

1. Sales Budget
2. Production Budget
3. Purchase Budget
4. Cash Budget
5. Capital Budget
6. Personnel Budget
7. Research budget
8. Master Budget

(B) Periodical Budget

1. Short-term Budget
2. Long-term Budget
3. Current Budget

(C) Budgets according to flexibility

1. Fixed Budget
2. Flexible Budget

1.2.9.1 Preparation of Budgets

(Note that the budgets which are included in the syllabus are discussed hereafter)

1. Sales Budget

The sales budget is the basic budget. All other budgets depend upon the sales budget. Therefore, it can be said that the sales budget is backbone or the nerve centre of the organization. It is the base of all other budgets. It shows which products are to be sold, how much quantity of the product is to be sold, when it will be sold, what will be the selling price per unit.

Forecasting of sales can be made either in quantity or the value. In case of an enterprise producing heavy goods, the budget can be mentioned in quantity. Whereas, in case of an enterprise producing FMCG products, the budget may be prepared in terms of value. The Sales Manager is to prepare and execute this budget. He may take assistance of salesmen and market research personnel for the preparation of sales budget. The following factors are to be considered while preparing sales budget.

a) **Potential Market and Demand for the Product**–It is quite necessary to understand first the potential market for our product. The market survey can give concrete idea about demand for the product, seasonal variation in the demand, buying behaviour of the customers, competitive product range, market share of each product, possible change in market, its impact (short term and long term) on demand, purchase power of customers etc. This enables the sales manager to prepare sales budget more accurately.

b) **Plant Capacity –** The most limiting factor is plant capacity which determines maximum possible volume of production and the sale. The capacity utilization is to be considered for economic way of production.

c) Proposed expansion or discontinuance of product.

d) Past experiences and the trends in production, demand and supply.

e) **Financial capacity** of an organisation

f) The terms of credit by suppliers and to the customers.

g) Promotion activities and cost of sales and distribution.

h) Government policies, rules, regulations and restrictions.

i) Policy of an organisation, product design, new product launching etc.

j) After sales services

The following example will illustrate the steps in preparation of sales budget.

Illustration1

ABC Co. Ltd. is to prepare sales budget for the month of April, May and June 2024. It sells its products in Maharashtra, Karnataka and Gujrat. Product-I is sold 10%, 20% and 70% respectively in Maharashtra, Karnataka and Gujrat and Product-II is sold 50%, 30% and 20%. The selling price of Product-I is ₹ 100 and that of Product-II is ₹ 140 per unit.

The terms of sale are 50% on cash and 50% on credit. The credit period is allowed to customers is one month.

1. Finished goods are valued at cost.
2. The monthly forecast of sales in units are –

Product	March	April	May	June	July
I	10,000	9,000	10,500	12,000	13,500
II	14,500	22,500	24,000	25,500	27,000

3. The same raw material is used for the production of both the products. The cost of raw material used is ₹ 10 per unit.
4. Two units of raw material are required to produce one unit of Product-I and four units are required for one unit of Product-II.
5. Wages are paid ₹ 6 per hour.
6. Production period required to produce one unit of each Product is one hour.
7. It is the policy of company to maintain stock of finished goods at 80% of next month's sale and that of raw material at 150% of current month's production.
8. The suppliers allowed credit period of one month.

9. Salary and wages are paid during same month.
10. Sales commission is paid @ 5% on total sales during the same month.
11. A machinery costing ₹ 1,50,000 needs to purchase during the month of May on cash.
12. A cash balance of ₹ 1,20,000 is required to maintain at the end of each month. The shortfall, if any, in the cash balance will be made available by taking cash credit facility from the State Bank of India @ 12% interest per annum. The loan can be availed or repaid at the end of the month along with interest. Surplus is also to be invested in SBI in Time Deposit.

The other details are as under

Salaries ₹ 15,000, rent ₹ 6,000 and Miscellaneous expenses at 1% of sales are paid during the month, Depreciation per month is ₹ 20,000/-.

The balance sheet of the company as on 31-3-2024.

ABC Co. Ltd.

Balance Sheet as on 31-3-2024

Liabilities	₹	Assets	₹
1. Creditors	12,30,000	1. Plant and Machinery	24,95,400
2. Reserve and Surplus	10,30,000	2. **Stocks**	
3. Share Capital	43,85,600	Raw Material: (1,50,000 units @ ₹10)	15,00,000
		Finished Goods:	
		Product-I (7,200 units @ ₹ 26)	1,87,200
		Product-II (1,800 units @ ₹ 46)	8,28,000
		3. Debtors	15,15,000
		4. Cash in hand	1,20,000
	66,45,600		**66,45,600**

We can prepare sales budget, production budget, cash budget and master budget from the above data. Also, we can prepare budgeted Profit and Loss A/c and the budgeted Balance Sheet.

Solution:

(1) Sales Budget (in ₹)

ABC Co. Ltd.

Area and Products		**Months**			**Total**
		April ₹	**May ₹**	**June ₹**	**₹**
Maharashtra	Product-I (10%)	90,000	1,05,000	1,20,000	3,15,000
	Product-II (50%)	15,75,000	16,80,000	17,85,000	50,40,000
	Total	**16,65,000**	**17,85,000**	**19,05,000**	**53,55,000**
Karnataka	Product-I (20%)	1,80,000	2,10,000	2,40,000	6,30,000
	Product-II (30%)	9,45,000	10,08,000	10,71,000	30,24,000
	Total	**11,25,000**	**12,18,000**	**13,11,000**	**36,54,000**
Gujrat	Product-I (70%)	6,30,000	7,35,000	8,40,000	22,05,000
	Product-II (20%)	6,30,000	6,72,000	7,14,000	20,16,000
	Total	**12,60,000**	**14,07,000**	**15,54,000**	**42,21,000**
Total Sales	Product-I	9,00,000	10,50,000	12,00,000	31,50,000
	Product-II	31,50,000	33,60,000	35,70,000	1,00,80,000
	Total	**40,50,000**	**44,10,000**	**47,70,000**	**1,32,30,000**

Alternatively, Sales Budget can be prepared in units

ABC Co. Ltd.

Sales Budget (in number of Units)

for the period April-June, 2024

Area and Products		Months			Total
		April ₹	**May ₹**	**June ₹**	**₹**
Maharashtra	Product-I (10%)	900	1,050	1,200	3,150
	Product-II (50%)	11,250	12,000	12,750	36,000
	Total	**12,150**	**13,050**	**13,950**	**39,150**
Karnataka	Product-I (20%)	1,800	2,100	2,400	6,300
	Product-II (30%)	6,750	7,200	7,650	21,600
	Total	**8,550**	**9,300**	**10,050**	**27,900**
Gujrat	Product-I (70%)	6,300	7,350	8,400	22,050
	Product-II (20%)	4,500	4,800	5,100	14,400
	Total	**10,800**	**12,150**	**13,500**	**36,450**
Total Sales	Product-I (10%)	9,000	10,500	12,000	31,500
	Product-II (50%)	22,500	24,000	25,500	72,000
	Total	**31,500**	**34,500**	**37,500**	**1,03,500**

2. Production Budget

Production Budget is based upon the sales budget. Therefore, it is prepared after sales budget. It is expressed in quantitive terms only. The production department prepares this budget. The following points are required to be considered while preparing production budget.

a) Analysis of Plant Utilization – How the plant is to be utilized, how many products are produced through the plant, the plant capacity, the capacity to be utilized etc. are to be considered first while preparing production budget.

b) Work-in-progress – The time required to complete the production cycle and the goods blocked in the process. The speed of processes.

c) Plan for Overtime – If the production needs to increase, the manager has to plan for overtime work in order to produce demanded quantity.

d) Introduction of Shift work – If overtime fails to produce required quantity of goods and there is unutilized capacity of a plant, production can be initiated through additional shifts.

e) Subcontract or Outsourcing– If the plant capacity is fully utilized and further production needs to increase, the simple alternative to increase production is the subcontracting for production. It can be the outsourcing of production.

f) Hire or Buy – The alternative that can be considered, if feasible, to increase the production capacity, by hiring the plant and machinery or by purchasing them at own.

g) Material Purchase Budget – It is crucial to take into account the material purchase budget in term of quantity and finance also. The budgeted production can be calculated with the help of following equation –

Budgeted Production (in units) = Sales estimate + Closing inventory required – Opening inventory required

Illustration 2

Prepare production budget with the data provided by ABC Co. Ltd. in illustration-1.

Solution:

Units to be purchased =

Estimated Sales (units):	xxxx
Add = Closing inventory required:	xxxx
Less – Opening inventory required:	xxxx

ABC Co. Ltd.
Production Budget (in Units)
for the period of April-June, 2024

	Months		
	April	**May**	**June**
1. Product-I			
Estimated Sales	9,000	10,500	12,000

Add: Closing Inventory Required (80% of next month sale)	8,400	9,600	10,800
	17,400	**20,100**	**22,800**
Less: Opening Inventory Required (80% of Current month's sale)	7,200	8,400	9,600
Units of Product-I to be produced	**10,200**	**11,700**	**13,200**
2. Product-II			
Estimated Sales	22,500	24,000	25,500
Add: Closing Inventory Required	19,200	20,400	21,600
(80% of next month sale)	**41,700**	**44,400**	**47,100**
Less: Opening Inventory Required (80% of Current month's sale)	18,000	19,200	20,400
Units of Product-II to be produced	**23,700**	**25,200**	**26,700**

3. Cash Budget

The cash budget is the summary of cash receipts and cash payments during particular period of time-say month, quarter or a year. The cash budget is prepared to ensure timely availability of cash in required amount so as to conduct smooth production, sale and all other activities of an organisation. It reveals the shortage or surplus of cash. When there is shortage an action can be taken to bridge the gap by way of bank overdraft or loan. On the contrary, if there is surplus cash balance, it can be invested properly.

The cash budget requires pragmatic forecast of sales, production, purchases, other expenses and all other activities. The cash budget is prepared on cash basis. The receipts are added whereas, payments are deducted there from and the balance is arrived at.

There are three methods of preparation of cash budget.

(1) Receipts and Payments Method

(2) Adjusted Earnings and Adjusted Profit and Loss Method

(3) Balance Sheet Charges Method

(1) Receipts and Payments Method

Under this method cash receipts and payments are estimated. Cash receipts form the following activities–

- Cash Sales
- Collection from the debtors
- Sale of fixed assets
- Issue of shares and debentures
- Receipts of interest, rent, discount, commission, royalty, etc.
- Receipts of bonus and dividends on investments.

The payments may be –

- **Operating expenses-**
  - Payment to creditors
  - Purchases of raw materials
  - Wages and Salaries
  - Repair and maintenance etc.
- **Non-operating expenses,**
  - Payment of Tax
  - Payment of Dividend, Bonus
  - Payments of Rent, Rates, cess etc.
- **Capital Payments**
  - Purchase of Assets
  - Repayments of Loans
  - Investments etc.

Majority of the companies use this method to prepare cash budget.

Illustration 3

From the details available of ABC Co. Ltd., a cash budget of the company can be prepared as under. It is necessary to consider detailed information provided by the Co. and the budgets prepared for various functions.

Solution:

ABC Co. Ltd.

Cash Budget

for period April-June, 2024

	Months		
	April ₹	**May ₹**	**June ₹**
Opening Cash balance / cash in hand	1,20,000	1,20,000	1,20,000
Add – Receipts of Cash			
Cash Sales (50%)	20,25,000	22,05,000	23,85,000
Collection from Debtors	*15,15,000	20,25,000	22,05,000
Total Cash Receipts (A)	**36,60,000**	**43,50,000**	**47,10,000**
Less: Cash Payments			
Creditors (for Supply of Raw Material)	*12,30,000	**13,80,000	**13,77,000
Salaries	15,000	15,000	15,000
Wages (@ ₹6/unit of production)	2,03,400	2,21,400	2,39,400
(as per production budget 10,200+23,700 units)	2,02,500	2,20,500	2,38,500
Sales Commission (@ 5% on Sales)	6,000	6,000	6,000
Rent	40,500	44,100	47,700
Miscellaneous Exp. (1% of Sales)	-	1,50,000	-
Purchase of Machinery			
Total Cash Payments (B)	**16,97,400**	**20,37,000**	**19,23,600**
Surplus / Deficit of Cash [(A) – (B)]	19,62,600	23,13,000	27,86,400
Minimum balance required	1,20,000	1,20,000	1,20,000
Surplus to be invested with SBI	18,42,600	21,93,000	26,66,400

* As given in the Balance Sheet

** **Note-**Creditors for purchases of raw materials are computed as under.

Purchase Budget (of raw materials) for April-June, 2021

Particulars	Months		
	April	May	June
Materials Required to Produce **Product –I** (2 units)	20,400	23,400	26,400
Materials Required to Produce **Product -II** (4 units)	94,800	1,00,800	1,06,800
Total Material Required for Production	**1,15,200**	**1,24,200**	**1,33,200**
Add: Closing stock required (150%)	1,72,800	1,86,300	1,99,800
Total	**2,88,000**	**3,10,500**	**3,33,000**
Less: Opening Stock of Material (Last month's closing balance is current month's opening balance)	*1,50,000	1,72,800	1,86,300
Raw Materials Required to Purchase	**1,38,000**	**1,37,700**	**1,46,700**
Creditors for supplyof Raw Materials@ ₹ 10/unit	**13,80,000**	**13,77,000**	**14,67,000**

* As given in the Balance Sheet

4. Master Budget

A master budget is prepared by summerising all functional budgets. It is also called as summery budget. This summery budget is presented in the form of –

a) The budgeted Profit and Loss A/c; and

b) The budgeted Balance Sheet

The budgeted profit and loss A/c is the summery of all revenue accounts and the budgeted balance sheet is summery of all capital items. The previous year figures are also shown in the master budget, in order to find variations if any and to analyse it for further improvement.

Illustration 4

We can prepare master budget of ABC Co. Ltd. For the period April-June 2024 from the data available in **Illustration 1** and the different functional budgets prepared for the same period.

Solution:

a) Budgeted Profit and Loss A/c

ABC Co. Ltd.

Master Budget

for the period April-June, 2024

	₹	₹
Budgeted Sales		1,32,30,000
Less: Cost of Goods Sold*		
Product-I (31,500 units x ₹ 26**)	8,19,000	
Product-II (72,000 units x ₹ 46***)	33,12,000	41,31,000
Gross Profit		**90,99,000**
Less: Opening Expenses		
Salaries	45,000	
Rent	18,000	
Sales Commission	6,61,500	
Miscellaneous Expenses	1,32,000	
Depreciation on Machinery ₹ 20,000 p.m.	60,000	9,16,800
Budgeted Net Profit		**81,82,200**

(a) Budgeted Balance Sheet

	₹	₹
Share Capital		43,85,600
Reservesand Surplus	10,30,000	
Profit and Loss A/c	81,82,200	92,12,200
Creditors		14,67,000
		1,50,64,800

Cash in hand		1,20,000
Debtors		23,85,000
Stock – Raw Materials (1,99,800 units x ₹ 10)	19,98,000	
Finished Goods-		
Product-I (10,800 units x ₹ 26)	2,80,000	
Product-II (21,600 units x ₹ 46)	9,93,600	32,72,400
Plant and Machinery (24,95,400 + 1,50,000)	25,45,400	
Less: Depreciation	60,000	25,85,400
Investments		67,02,000
		1,50,64,800

*Cost of goods sold are taken at material and labour cost

**Product-I consumes 2 units of raw material @ ₹ 10 and labour cost ₹ 6 (20 + 6)

***Product-II consumes 4 units of raw material @ ₹ 10 and labour cost ₹ 6 (40 + 6)

5. Fixed Budget

The Budget which is prepared on the basis of an estimated volume of production and sale is called fixed budget. There is no plan for change in activity level from the budgeted one. It is not adjustable to new levels of activity. The variability in an activity is not taken into account while preparing fixed budget. It is assumed that the activities and the situation will remain unchanged. Whereas, the fact differs from the plan / estimate or budget. Therefore, this budget remains of no use for assessment of performance when actual level of activity differs from that budgeted activity. This budget can be useful for assessment when the level of activity. Sales budget, purchase budget, production budget, cash budget are the examples of fixed budget.

6. Flexible Budget

The budget, which take into account changes in the level of activity and provide for the same while budgeting is called flexible budget. it is designed to change according to change in the level of activity. This budget gives different budgeted costs for different levels of activities. This budget is useful in business, of which sales cannot be predicted. e.g., sale of fashionable goods. The change in fashion is unpredictable, where flexible budget is useful.

The flexible budget is prepared by classifying the overhead expenses into fixed, variable and semi- variable. As well as the budget is prepared for different levels of activity. This gives several alternative budgets that enable organisation to manage its activities at different levels coping with the changes in actual practice. This budgeting uses principles of marginal costing. In short, this budget is prepared to control manufacturing overhead costs. Flexible budgets are also called as variable budget. This budget may be prepared in (a) table form, (b) equation form or (c) graphical form.

Illustration 5

Prepare flexible budget of ABC Co. Ltd., on the basis of data given below. Ascertain the overhead rates at 50%, 60% and 70% capacity.

Particulars	**At 60% Capacity** ₹
Variable Overheads –	
Indirect Material	6,000
Indirect Labour	18,000
Semi-variable Overheads –	
Electricity (40% Fixed, 60% Variable)	30,000
Repairs (80% Fixed, 20% Variable)	3,000
Fixed Overheads –	
Depreciation	16,500
Insurance	4,500
Salaries	15,000
Total Overheads	93,000
Estimated direct labour hours	1,86,000

Solution:

ABC Co. Ltd.

Flexible Budget for Overheads

	Capacity		
	50% (₹)	**60% (₹)**	**70% (₹)**
Variable Overheads – Indirect Material	5,000	6,000	7,000
Indirect Labour	15,000	18,000	21,000
Semi-variable Overheads			
(a) ***Electricity***- Fixed	12,000	12,000	12,000
Variable	15,000	18,000	21,000
(b) Repairs - Fixed	2,400	2,400	2,400
Variable	500	600	700
Fixed Overheads – Depreciation	16,500	16,500	16,500
Insurance	4,500	4,500	4,500
Salaries	15,000	15,000	15,000
Total Overheads	**85,900**	**93,000**	**1,00,100**
Estimated direct labour hours	1,55,000	1,86,000	2,17,000
Overhead rate per direct labour hour=	**0.55**	**0.50**	**0.46**
(Total overheads / Estimated direct labour hours)			

Illustration 6

The following data are available in ABC Co. Ltd., for the year ended 31-3-2024.

		₹ (000)
Fixed Expenses –	Wages and Salary	950
	Rent and Rates	660
	Depreciation	740
	Administrative Expenses	650

Semi-Variable Expenses (at 50% Capacity)		
	Repairs and Maintenance	350
	Indirect Labour	790
	Sales Department Salaries	380
	Administrative Salaries	280
Variable Expenses (at 50% Capacity)		
	Material	2,170
	Labour	2,140
	Other Expenses	790
Total Cost		**9,800**

(a) Fixed expenses remain constant at all levels of production.

(b) Semi-variable expenses remain constant between 45% and 65% capacity, increasing by 10% between 65% and 80% capacity and 20% between 80% and 100% capacity.

(c) Sales at various levels of capacity are (₹ 000)

50% Capacity	₹ 10,000
60% Capacity	₹ 12,000
75% Capacity	₹ 15,000
90% Capacity	₹ 18,000
100% Capacity	₹ 20,000

Prepare flexible budget for the year 2024-25 and forecast the profit at each level of capacity.

Solution:

ABC Co. Ltd.

Flexible Budget

For the year 2024-25 (₹ 000)

Capacity	50%	60%	75%	90%	100%
I)Sales	**10,000**	**12,000**	**15,000**	**18,000**	**20,000**
Fixed Expenses					
Wages and Salaries	950	950	950	950	950
Rent and Rates	660	660	660	660	660
Depreciation	740	740	740	740	740
Administration Expenses	650	650	650	650	650
Total Fixed Cost (A)	**3,000**	**3,000**	**3,000**	**3,000**	**3,000**
Semi-Variable Expenses					
Repair and Maintenance	350	350	385	420	420
Indirect Labour	790	790	869	948	948
Sales Department Salaries	380	380	418	456	456
Administration Expenses	280	280	308	336	336
Total Semi-variable cost (B)	**1,800**	**1,800**	**1,980**	**2,160**	**2,160**
Variable Expenses – Material	2,170	2,604	3,255	3,906	4,340
Labour	2,040	2,448	3,060	3,672	4,080
Other Exp.	790	948	1,185	1,422	1,580
Total Variable Cost (C)	**5,000**	**6,000**	**7,500**	**9,000**	**10,000**
II) Total Cost (A + B + C)	**9,800**	**10,800**	**12,480**	**14,160**	**15,160**
III) Profit (I – II)	200	1,200	2,520	3,840	4,840

Capital Expenditure Budgeting

Capital expenditure budget represents the estimated expenditure on fixed assets during the period of budget. It is related with the decision relating to investment in fixed assets. It includes addition, disposition, modification or replacement of fixed

assets. The problem involves decision whether the investment in (purchase of) asset is justified and the investment gives expected results / benefits. The decision may be based on traditional criterion and discounted cash flow criterion.

The Traditional criterion includes –

(a) Payback Period Method

(b) Return on Investment (ROI) Method

Discounted cash flow (DCF) criterion includes –

(a) Net Present Value (NPV) Method

(b) Internal Rate of Return (IRR) Method

(c) Profitability Index (PI) Method

(d) Discounted Payback Period

The criterion or method to be selected for decision making will depend upon circumstances. Accordingly, the management is to decide which method is to be adopted. Once the method is adopted should be used consistently and uniformly.

Payback Period Method

This method involves computation of number of years required to recover the original cash invested in the asset. The following equation is used for this purpose.

$$\text{Payback Method} = \frac{\text{Cash Outlay}}{\text{Annual cash inflow from the investment}}$$

e.g., If a project cost ₹ 50,000 and it yields annual cash inflow of ₹ 10,000 each year, the payback period will be –

$$\frac{\text{Rs. } 50{,}000}{\text{Rs. } 10{,}000} = 5 \text{ years}$$

The decision is to be taken as under

- When there are alternative choices of investment, the project which shows shorter payback period is to be preferred.
- If there is no alternative, the management will decide the desirable payback period. Accordingly, if the project shows less payback period than the desired, than the project will be considered for investment.

Limitations:

1. This method does not consider the maximization of wealth of an organisation.
2. This also does not consider the time value of money.
3. More emphasis is given on how quick investment is released.
4. The life after payback and earning thereafter is ignored.

When there are unequal cash inflows every year, the payback period is traced out by adding the annual cash inflows until the total comes to an equal amount of cash outflow (initial investment).

E.g., If a project costs ₹ 50,000 and the annual cash inflows during its life time of 5 years are ₹ 10,000, ₹ 11,000, ₹ 13,000, ₹ 15,000 and ₹ 18,000.

The payback period will be computed as under –

Initial cash outflow (Investment / project cost) ₹ 50,000 calculation of cash inflows

Year	Cash in flows (₹)	Cumulative cash in flow (₹)
I	10,000	10,000
II	11,000	21,000
III	13,000	34,000
IV	15,000	49,000
V	18,000	67,000

Here the project cash inflows attain the total ₹ 50,000 in the fifth year. Thus, the actual payback period is

$$= 4 \text{ years} + \frac{1,000}{18,000} \times 360 \text{ days}$$

= 4 years + 20 days

= 4 years and 20 days

Illustration 7

The following details are given to you by ABC Co. Ltd. for alternative three project –

	Project – P,	**Project – Q,**	**Project -R**
Cost ₹	50,000	70,000	70,000
Life in years	10	12	14
Estimated Scrap Value ₹	5,000	10,000	7,000
Annual Cash Inflow ₹	9,500	11,000	10,000

Rank the projects under (1) Payback period (2) Surplus life over payback period and (3) Surplus cash inflow

Solution:

(a)	**Calculation of Payback Period**	**Project – P**	**Project – Q**	**Project – R**
	Project Cost (₹) (A)	50,000	70,000	70,000
	Annual Cash Inflow (₹) (B)	9,500	11,000	10,000
	Payback Period = (A) ÷ (B)	5.26 years	6.36 years	7 years
	Rank	I	II	III
(b)	**Surplus Life over payback period**	10–5.26 years 4.27 years	12 – 6,36 years 5.64 years	14 – 7 years 7 years
	Rank	III	II	I
(c)	**Surplus Cash Flow =**			
	Total cash inflow over a life period	95,000	1,32,000	1,40,000
	Less: Cash outlay (Initial investment)	50,000	70,000	70,000
		45,000	**62,000**	**70,000**
	Add: Scrap value	5,000	10,000	7,000
	Net Cash Inflow (Surplus)	50,000	72,000	77,000
	Rank	III	II	I

Check your Progress-

1. State whether following statements are true or false.

1. Budgets are past results.
2. Cash budget is a part of financial budget.
3. Production budget always shows a constant output every year.
4. Budgetary control and standard costing do not go together.
5. A flexible budget is one that is prepared for changing level of activity.
6. A flexible budget is a profit and loss A/c and a balance sheet at the end of budget period.
7. Budgeting leads to forecasting and forecasting leads to budgetary control.
8. Budgetary control involves comparison of actual results with budgetary one.
9. Functional budgets are base for master budget.
10. Budget variance is the difference between a budgeted figure and the actual figure.

Return on Investment (ROI) Method

This method takes into consideration the return on investment. The rate of return is ascertained by considering total earning from the project over a period of its life. The project that shows higher rate of return is accepted. The return on investment is determined as under.

(a) Return on Investment = $\frac{\text{Total Profit After Depreciation}}{\text{Cost of Investment}} \times 100$

(b) Average Return on Investment = $\frac{\text{Average Profit After Depreciation}}{\text{Cost of Investment}} \times 100$

(c) Return on Average Investment = $\frac{\text{Total Profit After Depreciation}}{\text{Average Investment}} \times 100$

Average Investment = $\frac{\text{Investment at the Begining} + \text{Investment at the end of the Project}}{2} \times 100$

(d) Average Return on Average Investment = $\frac{\text{Average Profit after Depreciation}}{\text{Average Investment}} \times 100$

Average Profit after Depreciation = $\frac{\text{Total Profit After Depreciation}}{\text{Life of Project in years}} \times 100$

Illustration 8

ABC Co. Ltd. is to acquire new machinery. There are two alternatives, the details of which are as under.

	Machine – A	**Machine – B**
	₹	₹
Cost of Machinery	3,00,000	3,00,000
Expected Profits before depreciation for		
Year 1	1,50,000	60,000
Year 2	1,50,000	90,000
Year 3	90,000	1,50,000
Year 4	30,000	1,50,000
Estimated Life	4 years	4 years
Scrap Value	NIL	NIL

You are requested to suggest the company, which machine to be acquired on the basis of return on investment?

Solution:

	Machine – A	**Machine – B**
Total Profit before Depreciation	4,20,000	4,50,000
Less: Depreciation (cost – scrap)	3,00,000	3,00,000
Total Profit after Depreciation	1,20,000	1,50,000
Average Profit	30,000	37,500
Average Investment	1,50,000	1,50,000
(a) Return on Investment	$= \frac{1,20,000}{3,00,000} \times 100$ = 40%	$= \frac{1,50,000}{3,00,000} \times 100$ = 50%

(b) Average Return on Investment	$= \frac{30,000}{3,00,000} \times 100$ $= 10\%$	$= \frac{37,500}{3,00,000} \times 100$ $= 12,50\%$
(c) Return on Average Investment	$= \frac{1,20,000}{1,50,000} \times 100$ $= 80\%$	$= \frac{1,50,000}{1,50,000} \times 100$ $= 100\%$
(d) Average Return on Average Investment	$= \frac{30,000}{1,50,000} \times 100$ $= 20\%$	$= \frac{37,500}{1,50,000} \times 100$ $= 25\%$

Recommendation: The company may acquire Machine – B as it gives higher return.

Discounted Cash Flow Methods

These methods are based on time value of money. Under this method, it is clear that the value of ₹ 1 received today is not same in value as ₹ 1 received after a period of time. As ₹ 1 received today, if invested will fetch interest for a period of investment and the total value will be ₹ 1 + interest of the period. Thus, a ₹ 1 received today is worth more than the ₹ 1 received after a period. E.g. ₹ 1 received today invested @ 12% interest rate will give us ₹ 0.12 interest after one year. Thus, the value of ₹ 1 today is ₹ 1.12 after a year.

Therefore, a ₹ 1 received after one year is a lesser value that a ₹ 1 received today.

This method considers overall profitability of a projects and also the timing of returns.

The term discounting is reverse to compounding.

The formula for compounding is as under.

Amount to be received in future = Present Amount $(1 + \text{Rate of Interest})^n$

Where n = No. of years

The formula for present value is as under.

Present value of amount to be received in future = $\frac{1}{(1 + \text{Rate of interest})^n}$

Where n = number of year

The ready recknor for discount table shows present value of ₹ 1 at different rates of interest and at different years. These discounting factors can be obtained as under.

Illustration 9

Calculate the present value of ₹ 1 earned at the end of 1st, 2nd, 3rd, 4th and 5th year @ 10% interest per annum.

Solution:

Present Value = $\frac{1}{(1+0.10)^1}$	Present Value Factor
Present Value of ₹ 1 at the end of	1st year = $\frac{1}{(1+0.10)^1}$ = 0.9091 2nd year = $\frac{1}{(1+0.10)^2}$ = 0.8264 3rd year = $\frac{1}{(1+0.10)^3}$ = 0.7513 4th year = $\frac{1}{(1+0.10)^4}$ = 0.6830 5th year = $\frac{1}{(1+0.10)^5}$ = 0.6209

Net Present Value (NPV) Method

Net Present Value is the excess of present value of expected earnings (cash inflows) over the present value of cash outlay (outflow) of a project. The cash inflows and outflows are discounted at applicable present value factor in order to ascertain its present value. The present value of cash outflows is deducted from the total of the present values of all cash inflows. The resulting figure is termed as net present value (NPV). If NPV is positive, the project is accepted and vice-versa. Symbolically it can be presented as under.

E.g.,	**Outcome**	**Decision**
	NPV > zero	Accepted
	NPV < O	Reject
	NPV = O	Neutral

This method is consistent with the objective of maximization of wealth.

Illustration 10

You are the financial analyst of ABC Co. Ltd. You are asked to analyse two proposals of investment – viz. Project-X and Project-Y. Each project has a cost of ₹ 1,00,000 and the cost of capital for each project is 12%. The net cash inflows are as under –

Year	Project-X ₹	Project-Y ₹
0	(1,00,000)	(1,00,000)
1	65,000	35,000
2	30,000	35,000
3	30,000	35,000
4	10,000	35,000

(a) Calculate Payback period and (b) NPV and suggest which project is to be accepted.

(The discounting factors @ 12% of ₹ 1 for 1 to 4 years are respectively 0.8929, 0.7972, 0.7118 and 0.6355)

Solution:

(a) Calculation of Payback period

	Cash flows (₹)			
	Project -X		**Project -Y**	
	Actual	Cumulative	Actual	Cumulative
0	(1,00,000)	-1,00,000	(1,00,000)	-1,00,000
1	65,000	-35,000	35,000	-65,000
2	30,000	-5,000	35,000	-30,000
3	30,000	25,000	35,000	5,000

4	10,000	35,000	35,000	40,000
Payback period =	$2 + \frac{5,000}{30,000}$X 12 Months		$2 + \frac{30,000}{35,000}$ X 12 Months	
=	2 years + 2 Months		2years + 10.29 Months	
	2 years 2 Months		2 years 10.29 Months	

Project-X may be accepted as it has less payback period than that Project-Y has.

(b) Calculation of NPV

Year	**Project -X**			**Project -Y**		
	Cash flow	Discounting factor	Present Value	Cash flow	Discounting factor	Present Value
(1)	(2)	(3)	(4) = (2)x(3)	(5)	(6)	(7) = (5)x(6)
0	(1,00,000)	1	(1,00,000)	(1,00,000)	1	(1,00,000)
1	65,000	0.8929	58,039	35,000	0.8929	31,252
2	30,000	0.7972	23,916	35,000	0.7972	27,902
3	30,000	0.7118	21,354	35,000	0.7118	24,913
4	10,000	0.6355	6,355	35,000	0.6355	22,243
NPV= Inflow - Outflow			9,664	NPV= Inflow - Outflow		6,310

Project –X may be accepted as it has higher NPV.

Profitability Index (PI)

It is also called as Benefit Cost (B/C) Ratio. This is time adjusted technique of evaluation of an investment proposal or a project. The index of a proposal or a project is ascertained on the basis of present value of cash inflows and outflows. The equation of PI is as under.

$$\text{Profitability Index (PI)} = \frac{\text{Present Value of Cash inflows}}{\text{Present Value of Cash outflows}}$$

It shows present value of return (cash inflows) per rupee invested (cash outflows). The investment proposal may be accepted, when PI is more than 1. When

a project from alternative proposals is to be selected the criterion will be the higher PI. The project proposal which shows higher PI will be accepted. Because higher the PI, more will be the profit from the project proposal and vice-versa. This is called gross PI method.

Some times PI is expressed in net, which is computed as –

PI (Net) = PI (Gross) – 1

When PI net is positive, the proposal will be profitable. On the other hand, if PI net is negative, the investment proposal will not be worthwhile.

This method gives most reliable result. Therefore, this is most suitable method for evaluation of the project or investment proposal.

Internal Rate of Return (IRR) Method

IRR is the rate of return which gives zero NPV. It is also termed as yield of an investment, marginal efficiency of capital, rate of return on cost, time adjusted rate of return, etc. It is called internal rate of return because it depends on outflows and the inflows of investment. There is no other outside factor considered in determination of IRR.

In calculation of IRR of a project, it is necessary to use two discount rates (selected by trial-and-error basis) of the cash flows and find the NPV by each of them.

1. This method considers time value of money.
2. It considers all cash flows over the entire life of the project.
3. It is accepted by more users as it shows rate of return on capital.
4. The IRR suggests maximization of owners' wealth.

The limitations of the method are-

1. It involves complicated computations and therefore, difficult to understand.
2. It may give inconsistent results as compared to NPV method.

Check your Progress-

2. Fill in the blanks with correct word or phrase.

1. Budget is a comprehensive plan, expressed in terms of ……
2. Sales budget, purchase budget, production budget, labour budget are the examples of …… budget.
3. Budgeted profit and loss A/c and budgeted balance sheet are …… budgets.
4. Difference between discounted cash inflows and outflows is called ……
5. When profitability index is ……, the project may be rejected.
6. When IRR is greater than cost of capital, the project may be ……
7. Cash budget shows …… and …… of cash during budget period.
8. Return on Investment (ROI) is the ratio of …… to investment.
9. The time required to equate cash inflow to initial cash outlay is called …… period.

Illustration 11*(Calculation of IRR when cash inflows are constant / equal / same every year).*

A project to be undertaken costs ₹ 1,60,000 at the beginning. It is expected to yield ₹ 60,000 p.a. for 3 years. What will be the internal rate of return of a project?

Solution:

As the cash inflow is constant for each year the annuity table can be used to find a closer or nearer rate of return from which we can compute IRR.

IRR is the rate at which the present value of cash flow and that of outflow are equal.

∴ PV of cost = PV of cash inflow

₹ 1,60,000 = 60,000 *x* discounting factor of ₹ 1 p.a. for 3 years say *x*

₹ 1,60,000 = 60,000 *x*

$$\therefore x = \frac{1,60,000}{60,000}$$

$$= 2.667$$

Here, the discounting factor = 2.667

The annuity table shows cumulative discounting factors of ₹ 1 p.a. for 3 years as under.

The nearer discounting factors to 2.667 are –

2.624 at 7% rate of interest and

2.673 at 6% rate of interest, where difference between these two factors is

0.049 for 1% difference of rate of interest.

using interpolation, IRR = 6% + $(\frac{0.006*}{0.049})$

= 6.12%

*(0.006 = 2.673 – 2.667)

Illustration 12 *(Calculation of IRR when cash inflows p.a. differs year to year)*

ABC Co. Ltd. desires to establish a project costing ₹ 22,00,000 having life of 3 years.

The net cash inflows per year (after tax and including scrap value at the end of third year) are ₹ 7,70,000, ₹ 9,68,000 and ₹ 13,31,000 respectively. The company has sufficient funds to invest in the project without expecting any borrowings. The best alternative to the company is to invest funds elsewhere @ 10% p.a. compounding rate of interest.

Calculate

(a) NPV and give your recommendations.

(b) Internal Rate of Return using 16% and 17% discounting rate.

Solution:

(a) Calculation of NPV

Year	Cash flow ₹	Discounting Factors @ 10%	P.V. ₹
0	(22,00,000)	1	(22,00,000)
End of year 1	7,70,000	0.9091	7,00,000
End of year 2	9,68,000	0.8264	8,00,000
End of year 3	13,31,000	0.7513	10,00,000
NPV = (25,00,000 – 22,00,000 = 3,00,000)			

Recommendation – As the NPV is positive, investment in the project is worthwhile @ 10% dcf.

(b) Calculations of IRR based on 16% and 17% dcf.

Year	Cash flows ₹	Discounting Factors @ 16%	P.V. ₹	Discounting Factors @ 17%	P.V. ₹
0	(22,00,000)	1	(22,00,000)	1	(22,00,000)
1	7,70,000	0.8621	6,63,817	0.8547	6,58,119
2	9,68,000	0.7432	7,19,418	0.7305	7,07,124
3	13,31,000	0.6407	8,52,718	0.6244	8,31,076
			35,953		(3,681)

NPV at 16% rate = (+) ₹ 35,953

at 17% rate = (–) ₹ 3,681

difference for 1% = 39,634

$\therefore$ IRR = $16\% + \frac{35,953}{39,634}$

= 16.91% (approximately)

Check your Progress:

3. Choose correct alternative from given below the statement.

1. The activities and the situation are assumed remain unchanged in …… budget.

   a) cash b) production c) fixed d) all of these

2. Budgets are helpful in ……

   a) controlling cost b) controlling activities

   c) controlling business d) All of these

3. Payback period, return on investment, NPV are the techniques / tools used in …… budgeting.

   a) cash b) purchase c) capital d) sales

4. Master budget represents …… of all budgets.

   a)base b) summary c) tool d) hurdle

1.3 Summary

The term budget refers to future financial plan which, help management in controlling business activities. It is also compared with forecast. Whereas budgetary control refers to continuous comparison of actual results with budgets of activities, functions or processes of an organisation. It includes (a) establishment of budgets for each process, department, activity or section of the organisation (b) recording actual performance and comparison with budgeted figures and (c) ascertainment of variances and taking remedial action in order to achieve the objectives of the organisation.

Various types of budgets are prepared based on the functions and activities of the organisation. e.g., sales budget, production budget, purchase budget, labour budget, production overhead cost budget, working capital budget, capital expenditure budget etc. Master budget is prepared on the basis of all functional budgets. It is presented in the form of budgeted profit and loss A/c and budgeted balance sheet.

Capital expenditure budget is prepared to evaluate the project proposals for capital investment. Payback period, net present value, internal rate of return,

profitability index are the tools / techniques used for evaluation of capital expenditure project proposals.

Performance budgeting determines target for each activity, department or process of organisation. Several ratios are also set for these departments and / or the activities. The departmental heads or authorities prepare reports of their respective departments and submit to the higher authority. The variances and their reasons are them analyzed.

Responsibility accounting more specifically related to the responsibility of head of each department. It helps management in decision making and control over persons. The budgetary control system and its installment is essential to achieve organizational goal.

1.4 Terms to Remember

1. **Budget:** A budget is a comprehensive and co-ordinated plan, expressed in financial terms, for the operations and resources of an enterprise for some specific period in the future.
2. **Budgetary Control:** It means the establishment of budgets relating to responsibilities of executives to the requirements of a policy, and the continuous comparison of actual with budgeted results, either to secure by individual action the objective of that policy, or to provide a basis for its revision."
3. **Performance budgeting:** It is the budgetary system where the input costs are related to performance i. e. the result.
4. **Zero Base Budgeting:** The 'Zero-Base' refers to a 'nil-budget' as the starting point.
5. **Responsibility Accounting:** It is the method of assessing performance of an individual authority. Each person has given some authority in an organisation. The revenue and cost relating to the work or area assigned to a person are compared.

1.5 Answers to check your progress

1. 1) False 2) True 3) False 4) False 5) True 6) True
   7) False 8) True 9) False 10) True 11) True

2. 1) money / finance 2) functional`
   3) summary / master 4) NPV
   5) negative / less than 1 6) accepted
   7) inflows and outflow / receipts and payments
   8) profit / return / earnings 9) payback
3. 1) d 2) d 3) c 4) b

1.6 Exercise

1. Define "Budget" and "Budgetary Control". State the advantages of budgetary control.
2. What are the objectives of budgetary control?
3. Explain in brief the types of functional budgets.
4. Explain fixed and flexible budgets with suitable examples.
5. Explain the steps involved in preparation of sales budget.
6. Explain in detail the cash budget and give its specimen.
7. What is meant by master budget? Explain how it is prepared.
8. Explain payback period with suitable example.
9. What is meant by net present value (NPV)? How is it ascertained?
10. Write the importance of cash budget.
11. Real Life Corporation Ltd. is manufacturing two types of products – Product X and Product Y. The product is sold in two Regions of the State-East and West. The company has submitted you the following data.

1. Budgeted Sales for the current year-

Product	East Region	West Region
X	40,000 Units @ ₹ 14 per unit	60,000 Units @ ₹ 14 per unit
Y	30,000 Units @ ₹ 31 per unit	50,000 Units @ ₹ 31 per unit

2. Actual Sales for the current year-

Product	East Region	West Region
X	50,000 Units @ ₹ 14 per unit	70,000 Units @ ₹ 14 per unit
Y	20,000 Units @ ₹ 31 per unit	40,000 Units @ ₹ 31 per unit

It is found that Product X is fast moving in the market but the price is low, whereas Product Y is slow moving but high priced. Therefore, the management has decided to revise price of both products. To increase sales price of Product X by ₹ 2 and to decrease sales price of Product Y by ₹ 2 in order to improve in sales of both products.

The following estimates have made by the market research department considering the change in selling price of the products.

Product	East Region	West Region
X	Increase in Sales by 10%	Increase in Sales by 5%
Y	Increase in Sales by 20%	Increase in Sales by 10%

Prepare Sales Budget for the next year.

12. A German Company furnished the following data for May, 2021.

Sales – Mens-ware	₹ 17,50,000
Ladies-ware	₹ 12,50,000
Direct Material Cost	60% of sales
Direct Wages for 26 days	50 workers @ ₹ 300 per day
Factory Overheads – Indirect Labour	₹ 60,000 per month
Stores and Spares	2.50% on sales
Repair and Maintenance	₹ 80,000 per month
Power Consumption	₹ 50,000 per month
	₹ 31,000 per month

Other Expenses	₹ 40,000 per month
Administrative Expenses	₹ 80,000 per month
Selling and Distribution Expenses	

You are asked to prepare master budget of the Co. for the month of May, 2021.

13. An Electric Company manufactures two types of bulbs LED-10 Watt and CFL-10 Watt. Estimated Sales of both products for seven months from June, 2021 to Dec. 2021 are given below.

a. There will be no work in progress at the end of only month.

b. Stock of finished goods will be equal to half of sales during next month.

You are required to prepare production budget showing month wise production in units for the second half year July-December, 2021.

14. A factory is working at 50% capacity and producing 5,000 units at a cost of ₹ 90 per unit. The details are as under

1)	Material	₹ 50
	Labour	₹ 15
	Factory Overheads	₹ 15 (₹ 6 fixed)
	Administrative Overheads	₹ 10 (₹ 5 fixed)

2) The current selling price is ₹ 100 per unit.

3) At 60% capacity, Material cost per unit increase by 2% and selling price per unit falls by 2%

4) At 80% capacity, Material cost per unit increase by 5% and selling price per unit falls by 5%

Estimate profit of the factory at 60% and 80% level of capacity and give your comment.

15. Roxy Ltd. manufactures a single product of Iron with single labour grade. The sales budget and finished goods stock budget for a month are as under

1)	Sales	2,100 units

2) Opening Stock of finished goods 150 units

3) Closing Stock of finished goods 210 units

4) There are 10% of finished work is scrapped.

5) The standard labour house is 3 per unit.

6) The budgeted productivity ratio direct labour is only 80%

7) The company employs 36 labour who are expected to work for 144 house each in a month.

You are required to prepare

A) Production Budget

B) Direct Labour Budget

16. Prepare cash Budget for three months ending 30-06-2021

a)

Month	Sales ₹	Materials ₹	Wages ₹	Overheads ₹
February	1,40,000	96,000	30,000	17,000
March	1,50,000	90,000	30,000	19,000
April	1,60,000	92,000	32,000	20,000
May	1,70,000	1,00,000	36,000	22,000
June	1,80,000	1,04,000	40,000	23,000

b) Sales are made 10% on credit 90% on cash

c) 50% of the credit sales are collected in the next month and the balance in the following month.

d) Creditors for materials are of 2 months, wages ¼ month

e) Cash and bank balance expected at the beginning of April, 2021 v 60,000

Other information is –

1. Plant and Machinery will be installed in the month of February 2021 at a cost of ₹ 9,60,000.

   The monthly installment is payable ₹ 20,000 from April, 2021 onwards.

2. Dividend @ 5% on shares capital of ₹ 20,00,000 is to be paid on 1-6-2021

3. Advance on account of sales of old machinery will be received in the month of June, 2021 ₹ 90,000
4. Interest on Investment is due ₹ 10,000 in the month of June, 2021.
5. Advance Income Tax is to be paid in the month of June, 2021 ₹ 20,000.

17. The Alfa Co. Ltd. intends to acquire one machine where increase two alternative available in the market Details of which are as under. Cost of each machine is ₹ 5,50,000/-

Year	Annual Cash inflow	
	Machine - I	Machine – II
1st Year End	1,00,000	1,50,000
2nd Year End	2,00,000	1,50,000
3rd Year End	1,50,000	1,50,000
4th Year End	1,50,000	1,50,000
5th Year End	1,75,000	1,50,000

You are asked to suggest best alternative applying –

a) Payback period method
b) Internal Rate of Return
c) Net Present Value Method

Note – The Discounting factors for consecutive five years @ 10% are

1) 0.9091 2) 0.8264 3) 0.7513 4) 0.6830 5) 0.6209

1.7 Reference for Further Study:

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Unit-2
Marginal Costing & Cost Volume Profit Analysis

Index

2.0 Objectives:

After studying this unit you will be able to understand

- The technique and concept of Marginal costing and Absorption costing
- Difference between marginal costing and absorption costing
- Cost-Volume-profit (CVP) analysis
- The concept of P/V ratio, Break even analysis, Margin of Safety
- The use of marginal costing in different managerial decisions etc.

2.1 Introduction:

There are two techniques of product costing and income determination i.e., Absorption Costing and Marginal Costing. Marginal costing is also known as variable costing or direct costing or contributory costing and comparative costing etc. Under this technique, only variable costs are charged as product costs and included in inventory valuation. Fixed manufacturing costs are not allotted to products but are considered as period costs and thus charged directly to the Profit and Loss Account of that year. Marginal costing is the ascertainment of marginal costs and of the effect of changes in volume or type of output by differentiating between fixed costs and variable costs. Marginal costing is not a method of costing such as job costing, process costing and operating costing etc. but it is a special technique concerned with effect of fixed overhead on the profitability of a business. It brings out the relationship between the cost, volume of output and profit. In this unit we will discuss the application of marginal costing and how the various managerial decisions are taken by applying this technique.

2.2 Presentation of Subject Matter

2.2.1 Meaning and Definition of Marginal Cost and Marginal Costing:

Marginal Cost is derived from the word 'margin' and is a well-known concept of economic theory. In this way, and in line with the economic meaning of the term, it is narrated in simple words as the cost that arises from the production of extra increments of output. Naturally, it does not exist where there is no production of extra increments. Marginal costing is the ascertainment of marginal cost and the effect on profit of changes in volume or type of output by differentiating between

fixed costs and variable costs.

Definition of Marginal Cost and Marginal Costing :

CIMA defines marginal costing as "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 decision making".

According to Institute of Cost and Works Accountant, (ICWA) London, in its publication 'A report on Marginal Costing as "The amount at any given volume of output, which aggregate costs are changed if the volume of output is increased or decreased by one unit."

According to Institute of Chartered Accountants of England, "Marginal Cost in every expense whether of production, selling or distribution incurred by the taking of a particular decisions."

In simple words, marginal costing is a principle whereby marginal cost of cost units is ascertained. Only variable costs are charged to cost units, the fixed costs attributable to a relevant period being written off in full against the contribution for that period. Marginal cost is defined as the amount at any given volume of output by which aggregate costs are changed if the volume of output is increased or decreased by one unit. It is the sum total of prime cost plus variable overheads plus variable portion of semi-variable overheads. In the marginal costing technique, profit is measured by contribution less fixed overheads which include the fixed portion of semi-variable overhead also. Semi-variable overheads are segregated and the variable potion is added to the variable overheads and fixed amount is added to the fixed overheads, variable costs vary directly with output and cost per unit is the same. This is a linear relationship. Fixed costs remain the same regardless of the level of output and vary only with time.

The concept of marginal costing is a formal recognition of ideas underlying flexible budgets, break even analysis and cost volume profit relationships which involve a change in the conventional treatment of fixed overheads in relation to income determination.

2.2.1.1 Marginal Cost Equation:

The basic equation is:

Sales – Marginal cost or variable cost = Contribution

S – M = C or S – V = C

Contribution = Fixed cost + Profit

C = F + P

Alternatively: S – V = F + P

In case of Loss (L), S – V = F – L

At the Break-even point, profit = 0

Hence, S – V = F – 0 or S – V = F or S – V – F = 0

Profit = Contribution – Fixed cost. Or Profit = Sales – Variable cost – Fixed cost.

If any three of the above factors are known, the forth one can be ascertained.

Features of Marginal costing:

a. Segregation of costs on the basis of behavior i.e., fixed and variable elements and also the segregation of semi-variable overheads into variable portion and fixed amount is made.
b. 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.
c. In marginal costing Break even technique is employed.
d. The valuation of closing stock and closing work-in-progress is valued at marginal cost.
e. Prices are based on marginal costs and marginal contribution.
f. In marginal costing price of the products are fixed for exports.
g. The unit cost of a product means the average variable cost of manufacturing the product.
h. Contribution is the difference between sale value and marginal cost of sales. it facilitates decision-making in regard to product mix, sales mix, make or buy, machine or manual etc.

2.2.1.2 Merits and Demerits of Marginal Costing :

The following are the merits of Marginal Costing-

a. This technique is simple to understand and easy to calculate
b. Per unit marginal cost remains the same irrespective of its volume of production
c. Since variable cost measure does not require the calculation of fixed overheads

as unit amounts it is extremely useful for dynamic planning and decision making

d. This technique simplifies the problems of price estimation and price fixation

e. This technique is very useful in controlling the cost

f. The break even analysis, profit volume ratio techniques are useful in quick decisions.

Demerits of Marginal Costing:

a. The difficulty in realistically segregating some of the actual costs into fixed and variable components is the primary problem.

b. There has been absence of support and acceptability of marginal costing, none of the regularity authorities have accepted the method for valuing inventories for external reports and tax purposes.

c. In a long run the fixed costs cannot be ignored in decision making.

2.2.1.3 Marginal costing & Absorption Costing

Marginal costing and absorption costing are the two main techniques of cost ascertainment and determination of income. The main distinction between marginal and absorption costing is regarding the treatment of fixed manufacturing overhead. In marginal costing only variable manufacturing cost are included in the cost of products but fixed manufacturing costs are considered as period costs and charged directly to P & L account. But in absorption costing all variable manufacturing costs and also fixed manufacturing costs are included in the cost of products (cost of goods produced includes all manufacturing costs). Marginal and absorption costing treat non-manufacturing costs like administration, selling and distribution overheads as period cost. Marginal costing is mostly used for managerial purposes i. e. internal reporting, whereas absorption costing is used for computation of taxable income i. e. external reporting.

A) Marginal Costing:

According to CIMA, London. "The accounting system in which variable cost are charged to cost units and fixed costs of the period written off in full, against the aggregate contribution. It special value is in decision making."

Characteristics:

1. Segregation of cost:

All costs are classified into fixed and variable in marginal costing. Also semi-

variable costs are segregated into fixed and variable element.

2. Marginal costs as products costs:

In marginal costing only marginal costs are charged to products produced during the period.

3. Fixed cost as period costs:

In marginal costing fixed costs are treated as period costs and are charged to costing P & L account of the period in which they are incurred.

4. Inventory valuation:

In marginal costing the work in progress and finished stocks are valued at marginal cost only.

5. Contribution:

The difference between sales value and marginal cost of sales is contribution. The relative profitability of products is based on a study of contribution made by each of the products.

6. Pricing:

In marginal costing the calculation of prices are based on marginal cost plus contribution.

7. Profit and marginal costing:

Profit is calculated by two stage approach in marginal costing. First, contribution is determined for each product or department. The contributions of various products are pooled together and such a total of contribution from all products is called fund. Then from this fund is deducted the total cost to arrive at a profit or loss.

B) Absorption Costing:

According to CIMA, London.

Absorption costing is a method of costing that involves charging all manufacturing costs, both fixed and variable, to the product, regardless of whether they are incurred directly or indirectly.

Characteristics:

1. Charging of cost:

In absorption costing both variable manufacturing costs and fixed manufacturing

costs are charged to cost of products.

2. Stock:

In absorption costing stocks are also valued at total cost i. e. variable plus fixed cost.

3. Charge of Fixed cost:

In absorption costing fixed cost may be charged on actual basis or at pre-determined overhead rates based on normal capacity.

4. Factory overheads:

In absorption costing there may be under or over-absorption of factory overheads.

5. Non Manufacturing costs:

The all non manufacturing costs are treated as period costs i. e. administration, selling and distribution costs. These all are not included in the cost of products but are charged to P & L account of the period.

2.2.1.3.1 Difference between Marginal costing and Absorption costing:

The difference between marginal costing and absorption costing is as follows.

1. Treatment of Variable Costs:

Marginal costing is the practice of charging only variable costs to products, outputs or processes and absorption costing variable and fixed cost to products, outputs or processes.

2. Treatment of Fixed Costs:

There is no apportionment of fixed costs and they are charged to profit and loss account under marginal costing. But fixed costs are apportioned and charged to outputs or processes under absorption costing.

3. Stock Valuation:

Stock of work in progress and finished goods are valued at marginal cost in marginal costing. In absorption costing stocks are valued at total cost which includes both fixed and variable costs. It means stock values in marginal costing are lower than in absorption costing.

4. Profitability measurement:

Under marginal costing relative profitability of products is judged on the basis

of relative contribution made by respective products. In absorption costing relative profitability is based on profit figures which are also a guiding for managerial decisions.

5. Determination of Income:

The calculation of net profit under these systems may be same or may be different. It may be because of the different basis of inventory valuation. In marginal costing stocks of work in progress and finished goods are valued at variable cost whereas in absorption costing stocks are valued at total cost.

a. Marginal Costing:

Format of Income Statement

Particulars	Rs.
Sales	×××××
Variable Manufacturing Costs:	
Direct Material Consumed	×××
Direct Labour	×××
Variable manufacturing overheads	×××
Cost of Goods produced	×××××
Add: Opening stock of finished goods (valued at variable cost of previous periods)	
Less: Closing stock of finished goods (Valued at current variable cost)	
Cost of Goods sold	×××
Add: Variable Administrative, selling and distribution overheads	×××××
Total Variable Cost	×××××
Contribution (Sales – Total variable Cost)	×××××
Less: Fixed cost (Production, administration, selling & distribution)	×××××
Net Profit	

b. Absorption Costing:

Format of Income Statement

Particulars	Rs.	Rs.
Sales		×××××
Production Costs:		
Direct Material Consumed		×××
Direct Labour Cost		×××
Variable manufacturing overheads		×××
Fixed manufacturing overheads		×××
Cost of Goods produced		×××××
Add: Opening stock of finished goods (valued at cost of previous periods production)		×××
Cost of goods available for sale		
Less: Closing stock of finished goods (Valued at production cost of current period)		×××××
Cost of Goods sold		
Add: (or less) under or over absorption of fixed manufacturing overheads		×××××
Add: Administration Cost	×××××	×××××
Selling and distribution cost	×××××	
Total Cost		×××××
Profit (Sales – Total Cost)		×××××

6. Difference in Profit:

Calculation of profit under these systems may be varied because of difference in the stock valuation. It shows as follows.

Effect	Profit	
	Marginal Costing	Absorption Costing
Production is equal to sales	Equal	Equal
Production is more than sales	Lower	Higher
Production is less than sales	Higher	Lower

2.2.1.4 Marginal Costing, Direct Costing and Differential Costing :

Direct costing is the technique where only direct costs are considered while calculating the cost of the product. Indirect costs are met against the total margin (excess of selling price over direct costs) given by all the products taken together. Many accountants use direct costing and marginal costing as synonymous terms. This is unfortunate, because all direct costs need not be variable costs. A direct cost, it may be recalled is a cost that can be identified readily with a department, a function, a unit of product or some other relevant unit. Direct cost can be fixed as well as variable. i. e. if rent paid for a factory building in which only one product is being manufactured, the rent paid will be taken as a direct cost but not as a variable cost. Thus, the cost of the product under direct costing and marginal costing will be different. Though, most of the direct costs are variable costs but, as explained above all direct costs may not be variable. The term variable costing should be preferred to marginal costing as compared to direct costing.

On the other hand, under variable costing we consider only the variable cost for calculating the cost of production and inventory valuation. So we can say that both marginal costing and direct costing are different. Both are technique of costing, which can be used with different processes of costing like job costing, process costing etc.

Marginal costing is sometimes confused with differential costing. The term differential costing means a technique used in the preparation of adhoc information in which only cost differences between alternative courses of action is taken into consideration. Thus, in vase of differential costing a comparison is made between the cost differential between two or more situations and decision regarding adopting a particular course of action is taken if it is on the whole profitable. The cost difference which, is being taken under differential costing takes into consideration all type of costs but on the other hand, marginal costing takes into consideration only variable cost.

Difference between Marginal costing and Differential costing:

The difference between marginal costing and differential costing is as follows.

1. Concept:

Marginal cost is a unit concept and applies to output per unit basis. Whereas,

differential cost is a total concept and applies in a fixed additional quantity of output.

2. Presentation:

Marginal costing is presented by showing contribution per unit and fixed cost as a total amount. Whereas differential costs are presented in total in both formats.

3. Treatment in accounting system:

Marginal cost can be incorporated in the accounting system but differential cost is determined separately from the analysis of accounting records.

4. Product Cost:

Product cost under differential cost analysis may contain fixed costs, which will not be so under marginal costing.

5. Managerial Decisions:

In marginal costing managerial decisions are based mainly on contribution but in deferential costing differential costs are compared with incremental or decremental revenues for evaluating managerial decisions.

6. Use:

Differential costing can be used both in case of marginal costing and absorption costing, whereas marginal costing is not useful in absorption costing.

The manner of application of differential costing is somewhat different from that of marginal costing. Under differential costing, differential costs of various alternatives are compared with the different revenues and the decisions are taken on the basis of maximum net gain. While evaluating the viability of different projects, making a choice out of several alternative proposals, differential costing helps in a better way than marginal costing. Under marginal costing, while deciding about the profitability of products for making cost benefit analysis, fixed costs are also considered at some stage, it takes the shape of differential costing. Hence practically, the purpose of applying the two techniques are the same and we have not made any difference in the application of these techniques to the problems which management has to face in its routine or otherwise decision-making process.

2.2.2 Break Even Point & BEP Analysis

A) Break Even Point:

The break-even point means the level of production and sales where there is no profit and no loss. This is the point where total cost is equal to total sales revenue. It is the point at which business's total revenue equals to its total fixed and variable costs, resulting in neither profit nor loss. The break-even point is a crucial concept in management accounting, helping businesses understands the relationship between costs, sales and profitability.

Formula:

$$\text{Break-even point} = \frac{\text{Fixed Costs}}{\text{Selling price}(-)\text{ variable costs}} \text{ or } \frac{\text{Fixed Costs}}{\text{Conribution in volume per unit}}$$

B) Break even analysis:

It is a widely used technique to study the cost-volume-profit relationship. In narrow sense it is concerned with determining breakeven point. BEP means the level of production and sales where there is no profit and no loss. In other words BEP means the point where total cost is equal to total sales revenue. In broader sense it is used to determine probable profit or loss at any given level of production or sales. It is used to determine the amount of sales to earn a desired amount of profit also.

This technique uses the marginal costing to predict cost behavior and thereby to predict profits or losses of a business in future period of time. The break even point is the volume of output or sales at which total cost is exactly equal to sales. It is a point of no profit and no loss. Break-even analysis is very much an extension or even part of marginal costing. Carl Heyel in Encyclopedia of Management defines break-even analysis as " a method of studying the relationship among sales revenue, fixed costs and variable expenses to determine the minimum volume at which production can be profitable. It is a useful technique in business decision-making."

Sales – (Variable Cost + Fixed Cost) = Zero Profit

$$\text{BEP (Units)} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$$

$$\text{BEP (Value)} = \frac{\text{Fixed Cost}}{\text{P/V ratio}}$$

BEP (Value) $= \frac{\text{Fixed Cost}}{\text{P/V ratio}} \times 100$

Influence of fixed cost, variable cost and selling price on BEP:

Particulars	P/V ratio	Effect on BEP	Profit
a. Increase in fixed cost	No effect	Higher	Lower
b. Decrease in fixed cost	No effect	Lower	Higher
c. Increase in variable cost	Decrease	Higher	Lower
d. Decrease in variable cost	Improve	Lower	Higher
e. Increase in selling price	Improve	Lower	Higher
f. Decrease in selling price	Decrease	Higher	Lower
g. Increase in sales volume	No effect	No effect	Higher
h. Decrease in sales volume	No effect	No effect	Lower

Whenever there is influence or effect, revised calculation of P/V ratio, BEP and profitability are worked out and submitted to the Management for necessary action in this regard.

Assumptions of BEP analysis:

The break even analysis is relied on the following assumptions:

1. Variable cost per unit remains constant and total variable cost varies in direct proportion to the volume of production.
2. All costs can be separated into fixed and variable components.
3. Total fixed cost remains constant.
4. There is only one product or in the case of multiple products, the sales mix does not change. In other words, when several products are being sold, the sale of various products will always be in some predetermined proportion.
5. Selling price per unit does not change as volume changes.
6. Productivity per worker does not change.
7. There is synchronization between production and sales. In other words, volume or production equals volume of sales.
8. There will be no change in the general price level.

2.2.2.1 Advantages of BEP Analysis:

Following are the advantages of BEP analysis,

1. **Break-even point:**

   Break-even analysis helps in determining the break-even point.

2. **Selling price:**

   Break-even analysis helps in the determining the selling price which will give the desired profits.

3. **Sales volume:**

   Break-even analysis helps in determining the sales volume to earn a desired profit or return on capital employed.

4. **Cost and revenue:**

   Break-even analysis helps in determining the costs and revenue at different levels of output.

5. **Sales mix:**

   Break-even analysis helps in determining the most profitable sales mix.

6. **Comparative Profitability:**

   Break-even analysis helps in determining comparative profitability of each product line.

7. **Effect of Change:**

   Break-even analysis studies the effect of change in selling prices or of price differentiation in different markets.

8. **Up-downs in Cost:**

   Break-even analysis studies the impact of increase or decrease in fixed and variable costs on profits.

9. **Effects on Profits:**

   Break-even analysis studies the effect on profits and BEP of high proportion of variable costs with low fixed cost and vice-versa.

10. **Compares Profitability:**

    Break-even analysis compares the profitability of various firms. This is helpful in decision making of firms.

11. Decision Making:

Break-even analysis helps in management decision making like, in make or buy decisions, discontinuance of a product line, acceptance of special job etc.

12. Requirement of Cash:

Break-even analysis helps in determining cash requirements at different levels of operation with the help of cash break-even charts.

2.2.2.2 Limitations of BEP analysis:

Break-even analysis is an invaluable tool for management which helps in decision making. But these techniques have some limitations. These limitations arise from certain assumptions on which the analysis is based and which are in effect not true. The limitations of break-even analysis are as follows.

1. Separation of fixed and variable cost:

The assumption that all cost can be clearly separated into fixed and variable components is not possible to achieve accurately in practice, thereby resulting in inaccurate break-even analysis.

2. Variable cost remains constant:

The assumption that variable cost per unit remains constant and that gives a straight line chart is not always true. In practice many of the variable costs do not observe this tendency. Most of the variable costs no doubt move in sympathy with the volume of production but not necessarily in direct proportion to the volume.

3. Fixed cost remains constant:

The assumption that fixed cost remains constant is not realistic. Fixed costs are constant only within a limited range of output and tend to increase by a sudden jump when additional plant and machinery is introduced.

4. Selling price remains unchanged:

The assumption regarding selling price remains unchanged as volume changes is also unrealistic. In practice selling price do not remain fixed and change in prices affects demand. Any increase in output can be sold only by effecting a reduction in selling price which would affect the sales line.

5. Product mix remains unchanged:

The assumption that only one product is being produced or that product mix will remain unchanged is also not found in practice. The sales of various products manufactured are not always in predetermined proportion.

6. Synchronization of production and sales:

In BEP analysis it is assumed that production and sales are synchronized. This is not always true. Sales may fall short of production or may be capable of increase to match production only by effecting a reduction in selling prices.

7. Ignorance of capital employed:

The break-even analysis completely ignores the consideration of capital employed which may be an important factor in the study of profit analysis.

These are the various limitations of break-even analysis. But it is a very useful device to management in decision making. It should be used by keeping in mind its limitations because than alone the technique can be used more effectively.

2.2.2.3 Graphical Presentation of Break-even Analysis:

A) Break-Even chart:

It is a graphic presentation of break-even analysis. This chart takes its name from the fact that the point at which the total cost line and the sales line intersect is the break-even point. A break-even chart not only shows the beak-even point but also shows profit and loss at various levels of activity. Thus a break-even chart portrays the following information.

a. BEP- The point at which neither profit nor loss.

b. The profit or loss at different levels of output.

c. The relationship between variable cost, fixed cost and total cost.

d. The margin of safety.

e. The angle of incidence, indicating the rate at which profit is being made.

f. The amount of contribution at various levels of sales.

B) Angle of Incidence:

It is the angle formed by the intersection of sales line and total cost line at the

break-even point. It shows the rate at which profits are being earned once the break-even point has been reached. The larger the angle, the grater is the rate of profits. Therefore the aim of management will be to have as large an angle as possible. The angle of incidence is of particular importance in boom periods when sales are expanding. Taking in conjunction with margin of safety, therefore a large angle of incidence with a high margin of safety indicates and extremely favorable position.

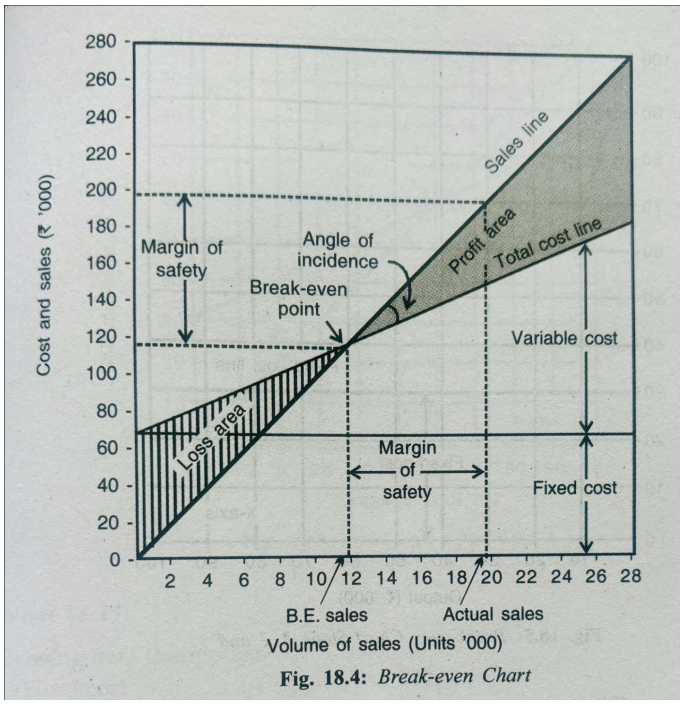

Fig. 18.4: *Break-even Chart*

Margin of Safety:

It is the difference between total sales revenue and sales at Brea-Even point. If the distance between total sales revenue and BEP is long, it indicates the soundness of the business.

Margin of safety = Total Sales – Sales at BEP

$$\text{Margin of Safety ratio} = \frac{\text{Total Sales} - \text{Sales at BEP}}{\text{Total Sales}} \times 100$$

With the help of margin of safety ratio, profit can be ascertained as follows:

Profit = P/V ratio X M/s ratio X Sales.

D) Profit—Volume Ratio (P/V Ratio):

Profit volume ratio, as is obvious, is the ratio of contribution margin to sales. If the excess of unit sales revenue over its variable cost is divided by unit selling price the result is P/V ratio, i.e., (P- V) + P. Put it differently, it is the complement of the variable cost ratio such that P/V ratio = 1 – V/P ratio. Usually expressed as a percentage of sales, it shows what percentage of each rupee sales is a available for the coverage of fixed costs and then yield profit. Symbolically, it is

$$\text{P/V Ratio} = \frac{\text{Contribution per unit}}{\text{Selling price per unit}}$$

$$\text{P/V Ratio} = \frac{\text{Sales revenue – Variable cost i.e.(Contribution)}}{\text{Sales revenue}}$$

$$\text{P/V Ratio} = \frac{\text{Fixed expenses + profit}}{\text{Sales revenue}}$$

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

Hence, Contribution = Sales X P/V ratio

Variable cost is the complement of P/V ratio, in another way it is 1- P/V ratio. Thus, if the P/V ratio is 40%, the variable cost ratio will be 60%.

P/V ratio can be improved by—

1. Increasing selling price
2. Reducing the variable costs
3. Changing the product mix, i.e, sale of products having a high P/V ratio should be increased and sale of products having a low P/V ratio should be reduced or eliminated.

Increase or decrease in fixed overheads does not affect the P/V ratio. But it may reduce the profit or increase the profit respectively.

2.2.3 Cost Volume Profit (CVP) Analysis:

As the name suggests cost-volume-profit analysis is a study of the relationships

between costs and volume, and their impact on profit. The three parameters are related to each other so that the volume is a function of price, and cost is a function of volume. The analysis seeks to determine and express the interrelationships of the activity, costs, sales prices and sales mix to earning. More specifically, it concerned with what will be the effect on earnings of changes in sales volume, sales prices, sales mix, and costs. The analysis is concerned with the effect on profits of changes in

a. fixed costs

b. variable costs

c. sales quantities

d. sales prices and

e. sales mix. Such a comprehensive dissection allows management to determine relative profitability of a product by examining the incremental effect of volume on costs revenues, and profits. It is primarily a planning tool to assist management in effectively utilizing fixed resources in the short run.

Summary of formulae:

1. Contribution = Sales – Variable Cost (S- V) or

= Fixed Cost + profit (F + P) or

= Fixed Cost – Loss (F-L)

Also, Contribution = Sales in Rs. X P/V ratio

Contribution = Sales at BEP in units X Contribution per unit) + Profit

Contribution = Sales at BEP in Rs. X P/V ratio) + Profit

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

P/V Ratio $= \frac{\text{Fixed expenses + profit}}{\text{Sales revenue}} \times 100$

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

3. BEP (Units) $= \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$

BEP (Value) $= \frac{\text{Fixed Cost}}{\text{P/V ratio}}$

4. Calculation of sales to earn a given profit

   (In Units) $= \frac{\text{Fixed Cost}}{\text{P/V ratio}}$ Or (In Rs) $\frac{\text{Fixed Cost + Profit}}{\text{P/V ratio}}$

5. Margin of safety = Actual sales -- Break even point

6. Sales to earn a desired profit

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

2.2.4 Decision making by using Marginal Costing:

Following managerial decisions are taken with the help of marginal costing:

a. Acceptance or rejection of an order
b. Selection of product mix
c. Discontinuation of a product line
d. Introduction of a new product line
e. Selection of best method of production
f. Pricing of product
g. Make or buy decisions
h. Expand or buy decisions
i. Replacement of machinery
j. Closing down of business or to continue the business at a loss.

Check your Progress Section I

- **Choose the correct alternative from the given alternatives:**

1. The method of costing that leads itself to break-even analysis is ---

   a. Standard Costing b. Marginal Costing

   c. Absorption Costing d. Operating Costing

2. Given the sales volume, which of the following circumstances would lead to an increase in contribution margin?

   a. When variable cost per unit remains the same

b. When variable cost per unit decreases

c. When fixed cost decreases

d. When variable cost per unit increases

3. If margin of safety is --- the firm cannot withstand, if there is a large fall in sales

   a. Low b. High c. Does not exist d. Equal

4. Contribution would occur early to a firm if fixed costs are----

   a. Low b. High c. Does not exist d. Not relevant

5. Profit Volume (P/V) ratio = ------/ Sales X 100

   a. Contribution b. Fixed Cost c. Variable Cost d. Profit

Section II

- **Fill in the blanks:**

a. --- indicates the relationship of contribution to sales

b. ---- is the sales volume at which sales revenue equals total cost

c. ---- means difference between total sales volume and sales at break-even point

d. With the help of ----- analysis, it is possible to decide which product is most profitable and lease profitable.

e. ------ Costing is a full cost or total input concept.

Section III

- **State the following statements are 'True' or 'False':**

a. Marginal costing is not a method of costing.

b. Increase in sales volume does not affect on profit volume ratio

c. CVP analysis helps the firm in understanding the impact of change in cost volume and price on the behavior of profit

d. Contribution is also known as Gross Margin

e. P/V ratio can be used to calculate BEP and ascertain required sales to achieve a desired level of profit.

2.2.5 Profit Planning:

Profit planning refers to the process of establishing financial goals and objectives for an organization, and developing strategies to achieve them. It involves analyzing various factors that affect profitability, such as revenue, costs, pricing and market trends.

Definition:

1. Profit planning is the process of establishing goals and objectives for the firms profit performance and developing the strategies, tactics and programs necessary to achieve them.- **Edwin Flippo.**
2. Profit planning is the process of determining the optimal level of output, pricing and resource allocation to maximize profits. – **Willam J. Baumol**.
3. Profit planning is the process of developing and implementing strategies to achieve an organizations profit objectives. - **The Institute of Management Accountants**.

Profit planning is in an important respect more than a structure; it is a corporate way of life. it is a philosophy for running a business. It is of paramount importance that this be recognized by the people at top levels in a company if a program of profit planning is to have a fair chance of success.

There are four important ways of improving the profit performance of a business:

(i) Increasing the volume,

(ii) Increasing the selling price,

(iii) Decreasing variable cost, and

(iv) Decreasing fixed costs.

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

Steps in Profit planning:

The steps in profit planning are as follows:

1. Define objective:

The first step in profit planning is to establish clear and specific objectives. This involves defining what the organization wants to achieve in terms of profit, revenue growth, market share and return on investment. The objective should be measurable, achievable, relevant and time bound to ensure focus and direction.

2. Analyze internal and external Factors:

The next step is to analyze the internal and external factors that affect the organizations profitability. This includes conducting a SWOT analysis to indentify strengths, weaknesses, opportunities and threats. The analysis should also consider market trends, competitor activity, economic conditions and regulatory requirements.

3. Develop a sales forecast:

A sales forecast is a critical component of profit planning. This involves estimating future sales revenue based on historical data, market trends and other factors. The forecast should be realistic and take into account factors such as seasonality, competition and economic conditions.

4. Determine costs and pricing:

The fourth step is to determine the organizations costs and pricing strategy. This involves analyzing fixed and variable costs as well as developing a pricing strategy that balances revenue and demand. The pricing strategy should take into account factors such as competition, market conditions and customer willingness to pay.

5. Create a budget and allocate resources:

With the sales forecast cost structure and pricing strategy in place the next step is to create a budget and allocate resources. This involves outlining projected income and expenses as well as allocating resources such as labor, materials and equipment.

6. Monitor and adjust:

The final step in profit planning is to monitor and adjust the plan as necessary. This involves regularly reviewing actual performance against the budget and making adjustment to stay on track. The plan should be flexible enough to accommodate changes in the market, competition or other external factors.

2.2.6 Practical Problems

Illustration 1

a. BE point Rs.40,000, Fixed cost Rs. 15,000. What is the P/V ratio?

b. Fixed cost Rs. 12,000, Actual sales Rs. 48,000. Margin of safety Rs. 8,000. What is the P/V ratio?

c. Margin of safety 60%, Fixed cost Rs. 2,10,000, Variable cost ratio to sales 70%. Determine the amount of sales.

d. Find out BEP when P/V ratio 40%, Margin of safety 30%, Profit Rs. 12,000.

e. What is the amount of margin of safety when profit is Rs. 50,000, Contribution Rs. 70,000 and sales Rs. 7,00,000. Also determine the break even point.

f. Variable cost is 80% of sales and margin of safety is 40%. What is the amount of fixed cost if sales are Rs. 2,00,000?

Solution:

a. $$\text{BEP (Value)} = \frac{\text{Fixed Cost}}{\text{P/V ratio}}$$

$$\text{So, P/V ratio} = \frac{\text{Fixed Cost}}{\text{BEP}} 100 = \frac{15000}{40,000} \times 100 = \mathbf{37.50\%}$$

b. BEP = Actual sales - Margin of safety

= 48,000 – 8,000 = Rs. 40,000

$$\text{P/V ratio} = \frac{\text{Fixed Cost}}{\text{BEP}} 100 = \frac{12,000}{40,000} \times 100 = \mathbf{30\%}$$

c. P/V ratio = 100 – 70% = 30%

$$\text{BEP (Value)} = \frac{\text{Fixed Cost}}{\text{P/V ratio}} = \frac{2,10,000}{30\%} = \text{Rs. } 7,00,000$$

$$\text{Sales} = \frac{\text{BEP in Rs.}}{100 - \text{M/S \%}} = \frac{7,00,000}{100 - 60\%} = \frac{7,00,000}{40\%} = \textbf{Rs. 17,50,000}$$

d. Profit = Actual sales X Margin of safety% X P/V ratio

$$\text{Actual sales} = \frac{\text{Profit}}{\text{M/S ratio X P/V ratio}} = \frac{12,000}{40\% \text{ X } 30\%} = \text{Rs. } 1,00,000$$

BEP = Actual sales - Margin of safety

= 1,00,000 – 30% = **Rs. 70,000**

e. $$\text{P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{70,000}{7,00,000} \times 100 = \textbf{10\%}$$

$$\text{Margin of safety} = \frac{\text{Profit}}{\text{P/V ratio}} = \frac{50,000}{10\%} = \textbf{Rs. 5,00,000}$$

Fixed Cost = Contribution -- Profit

= Rs. 70,000 – 50,000 = Rs. 20,000

$$\text{BEP (Value)} = \frac{\text{Fixed Cost}}{\text{P/V ratio}} = \frac{20,000}{10\%} = \textbf{Rs. 2,00,000}$$

f. P/V ratio = 100 – 80% = 20%

BEP sales = Rs. 2,00,000 – 40% = Rs. 1,20,000

$$\text{BEP (Value)} = \frac{\text{Fixed Cost}}{\text{P/V ratio}}$$

Fixed Cost = BEP X P/V ratio

= Rs. 1,20,000 X 20% = **Rs. 24,000**

Illustration 2

1. Given the following information;

Units of out put	5,00,000
Fixed Cost	Rs. 7,50,000
Variable cost per unit	Rs. 2
Selling price per unit	Rs. 5

You are required to determine:

i. The break even point

j. The sales needed for a profit of Rs. 6,00,000 and

k. The profit if 4,00,000 units are sold at Rs.6 per unit

Solution:

Contribution = S – V = 5 – 2 = Rs. 3

$$\text{P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{3}{5} \times 100 = \mathbf{60\%}$$

i. $$\text{BEP (Value)} = \frac{\text{Fixed Cost}}{\text{P/V ratio}} = \frac{7,50,000}{60\%} = \mathbf{Rs.\ 12,50,000}$$

ii. $$\text{Sales} = \frac{\text{Fixed Cost + Profit}}{\text{P/V ratio}} = \frac{7,50,000 + 6,00,000}{60\%} = \mathbf{Rs.\ 22,50,000}$$

iii.

Sales (40,000 X 6)	= Rs. 24,00,000
Contribution (4,00,000 X 4*)	= Rs. 16,00,000
Less: Fixed Cost	= Rs. (7,50,000)
Profit	**Rs. 8,50,000**

(*New contribution per unit = Rs. 6 – 2 = Rs. 4)

Illustration 3 : A company manufactures a single product having a marginal cost of Rs. 0.75 a unit. Fixed costs are Rs. 12,000. The market is such that up to 40,000 units can be sold at Rs. 1.50 a unit, but any additional sales must be made at Rs. 1.00 a unit. There is a planned profit of Rs. 20,000. How many units must be made and sold?

Solution:

Planned profit = Rs. 20,000

Add: Fixed Cost = Rs. 12,000

Contribution Required = Rs. 32,000

Contribution per unit = Rs. 1.50 – 0.75 = Rs. 0.75

Contribution from 40,000 units = 40,000 X 0.75 = Rs. 30,000

New Contribution = Rs. 1.00 – 0.75 = 0.25 per unit

Additional contribution of Rs. 2,000 @ Rs. 0.25 per unit will require 8,000 units

Total sales required = 40,000 + 8,000 **= 48,000 units**.

Illustration 4 : Consider on the basis of the following data as to the reasonable of accepting a foreign order:

1. Variable cost per unit Rs. 24
2. Selling price per unit Rs. 40
3. Break even volume : 60% production capacity
4. Total production capacity : 50,000 units
5. Margin of safety : 1,00,000 units before export order
6. Export order : 10,000 units at Rs. 30 per unit

Note: Units to be exported require some modifications resulting in an increase of Rs. 1 in variable costs per unit.

Solution:

Statement showing position with export order

Particulars	Present position (Capacity 80%)	For export order (Capacity 20%)	Total Capacity (100%)
Sales (Units)	40,000	10,000	50,000
Sales Price (Rs)	40,000	30,000	--

	Rs.	Rs.	Rs.
Sales Value	16,00,000	3,00,000	19,00,000
Less: Marginal cost	9,60,000	2,50,000	12,10,000
	6,40,000	50,000	6,90,000
Less: Fixed costs	4,80,000		4,80,000
Profit	1,60,000	**50,000**	2,10,000

Export order should be accepted so far as cost considerations are concerned. Acceptance of the said order will result in an increase of Rs.50,000 in the contribution and the net profit.

Workings:

1. Production and sales at selected level of Activity : Margin of safety is 10,000 units Break even point is 60% production capacity (60% of 50,000 units = 30,000 units

   Sales at Selected activity = BEP Sales + Margin of safety

   = 30,000 + 10000 = 40,000 units

2. Fixed costs:

   BEP (in units) = Fixed cost / Contribution per unit

   = 30,000 units X Rs. 16 per unit = **Rs. 4,80,000**

3. Total variable costs at current production and for Export order:

   At current position: 40,000 units X Rs. 24 = Rs. 9,60,000

   For Export order: 10,000 units X Rs.24 + 1) = Rs. 2,50,000

Illustration 5 : A manufacturer is planning to drop one item from his product line and replace it with another. The present cost and out put data represented below:

Item	Price Rs.	Variable cost Per item	Percent of sales volume
A	20	10	40%
B	25	15	35%
C	30	18	25%

Total fixed cost per year – Rs. 1,50,000

Total sales for the previous year –Rs. 5,00,000

The item proposed to be dropped is A.

Do you agree with the proposal of the management? If you don't agree, give an alternative suggestion to the management.

Solution:

Present Profitability (Rs)

Particulars	A	B	C	Total
Selling price	20	25	30	
Less: Variable cost	10	15	18	
Contribution per unit	**10**	**10**	**12**	
P/V Ratio	10/20	10/25 X	12/30 X	
C/S X 100	X100	100	100	
	50%	40%	40%	
% of Sales Volume	40%			100%
Sales				
40% of 5,00,000	2,00,000	1,75,000	1,25,000	5,00,000
Contribution= Sales X P/V ratio				
200000 X 50%	1,00,000	70,000	50,000	2,20,000
Less: Fixed Cost				1,50,000
Profit				**70,000**

I will not agree with the proposal to drop A. It gives the highest contribution of Rs.1,00,000. Its P/V ratio also is the highest. Hence A should not be dropped. It is also suggested that C should be dropped as its P/V ratio is 40% and its total contribution is Rs. 50,000 only which is the lowest.

C. Practical Problems

Illustration 6 : The following figures relating to the performance of the company of the years I and II are available. You are asked to ascertain:

a. P/V ratio

b. Amount of fixed cost

c. Break even point

d. The budgeted profit for the IIIrd year if the budgeted sales for that year are Rs.1 crore.

Year	Total Sales (Rs. in '000')	Total cost (Rs. in '000')
First	7,000	5,800
Second	9,000	6,600

Solution :

. Year	Total Sales (Rs. in '000')	Total cost (Rs. in '000')	Profit (Rs. in '000')
First	7,000	5,800	1200
Second	9,000	6,600	2400
Change in Profit	2,000	800	1200

a. P/V Ratio = $\frac{\text{Change in profit}}{\text{Change in sales}} \times 100 = \frac{1200}{2000} \times 100 =$ **60%**

b. Fixed Cost = (Sales X P/V ratio) -- Profit

Year I = (70,000 X 60%) – 12,00,000 = **Rs. 30,00,000**

c. BEP (Value) = $\frac{\text{Fixed Cost}}{\text{P/V ratio}} = \frac{30,00,000}{60\%} =$ **Rs. 50,00,000**

d. Budgeted sales = 100,00,000

Contribution = 100,00,000 X 60% = 60,00,000

Profit = 60,00,000 – 30,00,000 = **Rs. 30,00,000**

Illustration 7 : A business expects to operate with fixed costs of Rs. 20,000 and variable costs of 60% of sales. You are required to ascertain;

a. The present break even point

b. the new break even point when (i) the fixed costs are increased by Rs.5000 (ii)

the variable costs are increased by 15% sales (iii) sales price is decreased by 20% (iv) Fixed costs are decreased by Rs.5000 (v) variable costs are decreased by 10% of sales (vi) sale price is increased by 20%.

Solution:

a. The present break-even-point = Rs. 20,000 / 40% = Rs. 50,000

b. The new break-even-point is in case:

   i. Rs. 25,000 / 40% =Rs. 62,500

   ii. Rs. 20,000 / 25% = Rs. 62,500

   iii. The decrease in sale price will not effect the amount of variable costs. Hence, the new ratio of variable costs to sales will be 60/80 X 100 or 75%. Therefore, the new BEP = Rs. 20,0000/25% = Rs. 80,000

   iv. Rs. 15,000/40% = Rs. 37,500

   v. Rs. 20,000/ 40% = Rs. 40,500

   vi. The increawe3 in sale price will not affect the amount of variable costs. Hence, the new ratio of variable costs to sales will be 60/120 X 100 or 50%

   The new BEP = Rs. 20,000/50% = Rs. 40,000.

Illustration 8 : Ravi products Ltd. Products T.V sets and sells them at Rs. 2,500 each. Variable cost per unit is Rs.1,250. Fixed costs amount to Rs. 125 lakhs.

Company operates at 75% production capacity and produces 12,000. TV sets accordingly. It considers the following two proposals.

a. 10% reduction in price to yield an increase in sales volume from 12,000 units to 14000 units.

b. 10% increase in price with decrease in volume of sales from 12,000 units to 11,000 units.

You are required to prepare a statement comparing goods revenue contribution and the P/V ratio of the two alternatives with present results. Which proposal is more profitable?

Solution:

Comparative Profit/ Loss Statement

Particulars	Current position	Proposal A	Proposal B
Sales unit	12,000	14,000	11,000
Sales price	2,500	2,250	2,750
Sales revenue	3,00,00,000	3,15,00,000	3,02,50,000
Variable cost	1,50,00,000	1,75,00,000	1,37,50,000
Contribution	1,50,00,000	1,40,00,000	1,65,00,000
Fixed cost	1,25,00,000	1,25,00,000	1,25,00,000
Net profit	25,00,000	15,00,000	40,00,000
P/V ratio	50%	44.44%	54.55%

Proposal B is more profitable as the contribution and P/V ratio is the maximum. However, before taking a final decision other cost and non-cost considerations like labour, possibility of labour unrest on account of retrenchment of labour staff, utilization of production capacity should be given due consideration.

Illustration 9 : A Component (X), the purchase price of which is Rs.10 per unit, is proposed to be manufactured at a marginal cost of Rs. 5 per unit. The processing time for the component on a machine is 5 hours. This machine is at present working at full capacity and is manufacturing another product (P), the selling price, marginal cost and processing time per unit of which are Rs.100, Rs. 60 and 20 hours respectively. The problem is whether to make or buy. Advise.

Solution:

In the above case key factor is machine hours. Hence let us find out the contribution per machine hour in respect of Component (X) and Product (P).

Particulars	Component (X)	Product (P)
	Rs.	Rs.
Price	10	100
Less : Marginal Cost	5	60
Contribution per unit	5	40
Processing time --- hours	3	20
Profitability = Contribution $\frac{Contribution}{Machine\ Hour}$	5/3 = Rs.1.67	40/20= Rs.2

Advise: It is advised to buy Component (X) from the market.

Reason: The Processing Time of Component (X) may be diverted to manufacture Product (P) as it contribution is Rs.2 per machine hour which is higher than that of Component (X).

2.3. Summary:

On the basis of separating costs into fixed and variable components, there are absorption and marginal cost approaches. These two alternative cost models have been offered to determine product costs and operating profit. It is, however, difficult to say as to which one is superior to the other because ultimately all costs have to be recouped out of revenues. Despite the developments over the years, marginal costing has not so far been accepted the world over by accounting profession and the taxation authorities for external reporting. They continue to insist on full costs for inventory values and cost of goods sold. Marginal costing has been used only for internal reporting.

Marginal costing is "a principle whereby marginal cost of cost units is ascertained. Only variable costs are charged to cost units, the fixed costs attributable to a relevant period being written off in full against the contribution. Marginal Costing is not a method of costing such as job costing, process costing and operating costing etc. but it is a special technique concerned with effect of fixed overhead on the profitability of a business. It brings out the relationship between the cost, volume of output and profit. Other terms in use are direct costing, contributory costing, variable costing and comparative costing. CVP model is extremely useful in planning the profits. Over a short time horizon, it offers valuable insights into the effect upon

profits when any of the basic parameters are changed. It is helpful in such short term decisions as pricing adding or deleting product lines. In the case of multi-product situations too, the basic formulae for B-E point remain unchanged. CVP is an elementary analysis and at best a static concept based on some rigid assumptions. It is not a cut and dried decision tool, and has to be used with caution.

2.4 Terms to Remember:

- **Absorption Costing:** This is a total cost technique under which total cost is charged as production cost.
- **Marginal costing:** It is known as variable costing or direct costing. Under this technique only variable costs are charged as product costs and included in inventory valuation.
- **Product costs:** Product costs are those costs which become a part of production cost.
- **P/V Ratio:** It is one of the important ratios to watch in business. It is an indicator of the rate at which profit is being earned.
- **Break-even-point:** This is the volume of output or sales at which total cost is exactly equal to sales. It is point of no profit and no loss.
- **Margin of Safety:** It is the difference between actual sales and sales at break-even-point.

2.5 Answer to check your progress:

Section I 1— b. 2— b. 3— a. 4— a. 5-- a.

Section II a. P/V ratio b. Break-even point c. Margin of safety d. CVP
e. Absorption

Section III – All statements are True.

2.6 Exercise:

A. Write Short Notes on the following:

1. Marginal costing—meaning
2. Break- even Analysis
3. Make or Buy decisions
4. Margin of Safety

5. Profit Volume ratio

B. Essay type questions:

1. Distinguish between Absorption costing and Marginal costing
2. Explain clearly what do you understand by "Contribution" in a cost accounting sense? How is it related to profit?
3. "Cost Volume Profit relationship provides management with a simplified framework for organizing, thing on a number of problems". Elaborate.
4. What is meant by term CVP relationship? Why is this relationship important in business management?

C. Practical Problems:

Problem 1. X firm produces four products-

Products	**Sales (in units)**	**Selling Price (per unit)**
A	20,000	5.00
B	30,000	3.00
C	15,000	3.50
D	10,000	2.50
	Fixed Cost (Rs)	**Variable Expenses (Rs.)**
A	40,000	50,000
B	90,000	60,000
C	45,000	30,000
D	25,000	20,000

Find out the present break-even point of the firm.

What will be the break-even point when,

1. Selling price is increased by 40% or
2. Volume of sales is increased by 5% or
3. The fixed cost has increased by 15% or
4. Variable cost is reduced by 20% or
5. Fixed cost is decreased by 20% or
6. Selling price is decreased by 15%.

Problem 2. The following figures for profit and sales are obtained from the accounts of ABC ltd.

Year	Sales (Rs.)	Profit (Rs.)
2023	2,00,000	20,000
2024	3,00,000	40,000

Determine the P/V ratio and BEP.

Problem 3. The sales and profit figures of two years of XYZ ltd are given below.

Year	Sales (Rs.)	Profit (Rs.)
2022	1,50,000	20,000
2023	1,70,000	45,000

Calculate:

1. P/V ratio
2. Break-even point
3. The sales required to earn a profit of Rs. 40,000
4. Margin of safety at a point of Rs. 50,000
5. The profit made when sales are Rs. 2,50,000.

Problem 4. From the following data calculate,

1. P/V ratio
2. Break-even point

	Rs.
Sales	1,00,000 (1,00,000 units at Rs. 1 each)
Variable cost	40,000
Fixed cost	50,000

Evaluate the effects of 20% decreasing sales units accompanied by 10% increase in selling price.

Problem 5. B ltd. Produces a special kind of cement which is packaged and sold in bags of 20 kgs. During March 2024. Its revenue and cost patterns were as follows.

	Rs.
Selling price per bag	30
Variable cost per bag	16
Fixed cost	10,000
Quantity	3000 bags

1. What is break-even quantity?
2. Assuming a 10% increase in the production volume, calculate the percentage change in profits.

Problem 6. The Kolhapur Industries ltd. is engaged in the manufacturing of machine. The cost structure and a motor is as under:

	Rs.
Material	50
Labour	80
Variable Overheads	75% of labour cost
Fixed overheads of the company	2,40,000 per annum

1. Determine the number of machines that have to be manufactured and sold in a year in order to break-even.
2. How many machines have to be made and sold to make a profit of Rs. 1,00,000 per year.
3. If the selling price is reduced by Rs. 15, what is the new break-even point?

Problem 7. The price structure of a bicycle made by the Hero bicycle company is as follow:

	Per Product (Rs.)
Materials	600
Labour	200
Variable Overheads	200
	1000
Fixed overheads	500
Profit	500
Selling Price	2000

This is based on the manufacture of 1,00,000 bicycle per annum. Due to competition company has to reduce selling price but units to keep the total and profits intact. How many bicycles will have to be marketed to get the same amount of profit if:

1. Selling price is reduced by 10%
2. Selling price is reduced by 20%

Problem 8. King Products Ltd., manufactured and markets a single product. The following data are available:

	Per unit (Rs.)
Materials	16
Variable cost	12
Dealers margin (10% on sales)	04
Selling price	40
Fixed cost	5,00,000
Present Sales	90000 units

There is stiff competition. Extra efforts are necessary to sell the product. If the company desires to maintain the present profit, how many units it should market, under the following alternative plans, assuming, all the goods produced are sold.

1. Reducing sales price by 5%
2. Increasing dealer's margin by 25% of the existing rate.

Problem 9. Mahesh Ltd., has submitted the following:

Its current capacity is 1,00,000 units. At its current level of operations its margin of safety is 50% of its break-even point. The contribution sales ratio is 25% current sales price is Rs. 40 per unit. The unutilized capacity at present is 10,000 units. Based on the above, calculate.

1. BEP in sales value
2. Margin of safety in units.

2.7 Reference to further study:

1. B.M. Lalla Nigam G. l. Sharma (2002) 'Cost Analysis and Conrol—A Managaemen Approach', Himalaya Publishing House, Mumbai
2. M.N. Arora (2009), 'Management Accounting' Himalaya Publishing House, Mumbai
3. P.VRatnam and D. Hanumanth Raju, (1996), 'Cost Accounting Theory, problems and Solutions', Pragati Publications, Jaipur

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Unit-3
Standard Costing and Variance Analysis

Index

3.0 Objectives

After studying this unit, you should be able to:

- To understand the theory of technique of standard costing
- To compute and analyse various cost variances

3.1 Introduction

The principle objection to normal system of costing is that it helps to ascertain the cost only but it fails to provide information as to what the cost should have been and whether the results achieved are satisfactory or not. The efficient cost system is, therefore, one which not only shows the cost of each unit produced but also explains why such cost differs from a pre-determined standard. This is achieved by means of the standard costing which provides a suitable yardstick to measure the actual performance. Predetermined costs are those which are computed in advance of production on the basis of a specification of all the factors affecting cost. Thus standard costing is not only a method of cost ascertainment but is a technique of cost control as well.

3.2 Presentation of Subject Matter

3.2.1 Definition of Standard Costing

Let us see some definitions of standard cost & standard costing.

(1) According to **Wheldon** : *"Standard Costs are pre-determined, or fore-cast estimates of costs to manufacture a single unit, or a number of units of a product during a specific immediate future period."*

(2) **Standard Cost** is a pre-determined cost which is calculated from the management's standards of efficient operation and the relevant necessary expenditure. It may be used as a basis for price fixing or for cost control through variance analysis.

(3) **Standard Costing** is the preparation and use of standard costs, their comparison with actual costs and the analysis of variances to their causes and points of incidence.

(4) **Standard Costing** is a method of ascertaining the cost whereby statistics are prepared to show

(a) the standard cost;

(b) the actual cost; and

(c) the difference between these costs, which is termed the variance.

3.2.1.1 Preliminaries to Establishment of Standards:

Before standard cost for different elements of cost is determined, management must take decisions about the following:

1. **Length of period of use:** First of all, a decision is to be arrived at relating to the period, for which standards will be used. According to this decision, management will decide to use current standard, basic standard or normal standard. This decision is the starting point for establishment or standards.
2. **Types of standards to be used:** It means that management should decide how tight or looses standards ought to be. Policy of management will help to take this decision. If cost reduction is the aim, a tight standard will be choice of management. Similarly, if pricing decision and planning the expenditure is the aim of management, standards corresponding to the current conditions will be the choice of management.
3. **Review of existing procedures:** The existing procedure should be subjected to review, because some activities may have to be routinised and wastage, rejections and losses may have to be standardized. This review will call for a complete study of technical and operational aspects of organization.
4. **Classification of accounts:** The existing accounts manual in an organization may not be sufficient to comply with the requirements of cost collection, cost analysis and variance reporting. For this reason, existing accounts manual may have to be suitably adapted to meet the requirements. This may call for a change in existing classification of heads of accounts.
5. **Review of existing coding system:** The existing coding system is subjected to review to adapt it to introduction of standard costing. This change may demand orientation of existing coding system.
6. **Constitution of standard committee:** An apex standard committee should be constituted. This committee should have representation of different functional Managers, like, Personnel Manager, Production Manager, Planning Manager and Marketing Manager. The cost accountant coordinates the functions of standard committee. It will be the job of this committee to prepare a detailed plan dealing with: a) introduction of standards; b) computation of variances; c) linking the deviations with responsibilities; d) reporting to management i.e.

deciding how various reports dealing with variances will be sent to various levels of management ;and e) developing a system of follow-up.

7. **Decisions to be taken at various levels:** For introduction of standard costing, certain important decisions will have to be taken at various managerial levels. These are summarized below:

   a) Top Management decisions

   b) Engineering Management decisions

   c) Manufacturing Management decisions.

   d) Sales Management decisions.

   e) Cost Accounting Department.

3.2.2 Characteristics of Standard Costing

From the definitions given above, the following characteristics of standard costing emerge:

(1) Standard cost is a *predetermined cost*.

(2) Standard cost is *determined after considering what can be* the cost under efficient management.

(3) It is used for *two purposes* (i) as a basis of price determination and (ii) as a tool of cost control.

(4) Standard costing is a *method of determining and using the standard cost* for cost control.

(5) For the purpose of control, *standard cost is compared with actual costs* and variances are calculated.

(6) *The variances* arrived at are then *analysed* in order to find out the root causes of variances, so that corrective steps can be taken.

Thus, in standard costing (a) cost of each element is determined before production starts. e.g. the cost of materials per unit, cost of direct labour per unit etc. are fixed on the basis of past experience, prevailing conditions and future changes likely to take place. (b) The actual costs are ascertained when actual production takes place. (c) The figures of actual costs are compared with predetermined (Standard)

costs. (d) If differences are found, causes of such differences are ascertained and corrective measures are taken.

The importance of standard costing as a modern technique of planning and control is increasing in recent times. Particularly in industrially advanced countries like the U. S. A. and the U. K., the standard costing system is widely used.

3.2.3 Advantages of Standard Costing

The main advantages derived by installation of standard costing may be summarised as follows:

(1) Useful in measuring performance: The actual performance can be readily compared with the pre-determined standards showing favorable or unfavorable variances. A standard cost is a figure which gives a fair and reasonable cost and the comparison of actual cost with such standards reveal the level of efficiency.

(2) Cost Reduction: The variances can be analysed in detail and thus it enables the management to investigate the causes. e.g. any inefficiencies of labour or use of materials will be discovered and necessary corrective actions can be taken by the management. This helps in controlling and reducing cost.

(3) Management by Exception: The principle of *'management by exception'* can be applied, which means that the attention of management is concentrated only on important matters. Analysis of variances makes it possible.

(4) Assists in performing managerial function: Standard costing provides valuable aid to the management in performing their managerial functions such as formulation of production policies, price policies, etc. It helps in planning, coordinating, organising and controlling.

(5) Less Clerical Work: On one hand it saves clerical labour and on the other hand, it gives more useful information to management. Under historical costing, a number of forms are in use, which are of little use to management. The standard costing standardises such forms and reduces the forms and records.

(6) Atmosphere of Cost Consciousness: It creates an atmosphere of cost consciousness among the personnel working in the organisation.

(7) Useful for Tenders: It facilitates submission of tenders and quotations. The scientifically fixed standards are ready at hand and quick computation becomes possible. It also serves as a guide for fixing selling price.

(8) Saving in Cost: While preparing standards, sources of inefficiency are likely to be disclosed. The setting of standards may, for instance, disclose that materials are being purchased in uneconomic lots, and that less frequent orders for a larger quantity would produce a significant saving through quantity discount.

(9) Basis of Inventory Valuation: Valuation of inventory for balance sheet purpose is made prompt and easy. Unnecessary expenditure of time and money in stock-taking is saved.

(10) Co-operation and Co-ordination: Cooperation among different departments is made possible and coordination of their work is facilitated.

3.2.4 Limitations of Standard Costing

Following are the Limitations of Standard Costing-

(1) Lack of Reliable Standards: In some of the business units, the system of standard costing has failed, because it has not been able to set the dependable standards of cost. This proves that the standards and variances are not useful for the purposes of control and guidance of management unless reasonable and dependable standards are fixed.

(2) Useless, if not flexible: Likewise, standards of cost serve no useful purpose, if they are not flexible. It means the standards must be modified in the light of the new developments or else they are useless.

(3) Duplication: Though historical costing suffers from certain limitations, it is necessary for certain purpose, e.g. for reconciling financial accounts with cost accounts. In such circumstances, it is duplication of cost accounts, if standard costing is adopted.

(4) Difficulties in setting standards: In some industries, particularly where production is carried on as per customers' orders, it is difficult to lay down standards each time a separate order is received. Besides, in industries where rapid technological changes are taking place, the standards have to be constantly revised. This makes the use of standard costing difficult.

(5) Adverse effects on Employees: Sometimes determining standards have adverse psychological effects on the employees. If the standards are fixed at a high level, they are not achieved and employees get frustrated. and hence they tend to oppose this system. Thus instead of encouraging efficiency, this system affects efficiency adversely.

(6) Controllable and Uncontrollable Variances: In order to fix responsibility for adverse variances, they are to be classified as controllable by responsible person and not controllable by him. But such classification is difficult. e.g. if wages increase due to idle time who is responsible? It may be controllable by Production Manager or may not be controllable by him.

Standard costing is thus a useful tool in the hands of management, provided its limitations are also kept in mind.

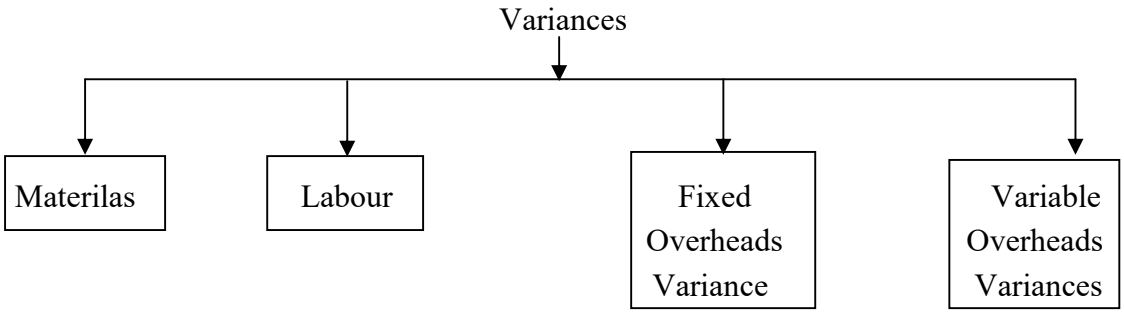
3.2.5 Variances

After standards for all elements of costs have been set, the next step is to compare the actual with standard costs to obtain the variances. When actual performances are recorded and compared with the standards set, then some deviations are found. These deviations are known as variances. *"A variance is the difference between a standard cost and the comparable actual cost incurred during a period."*

The variances may be favorable or unfavorable depending on circumstances. When the actual cost is more than the standard cost, the variance is unfavorable, adverse or red variance. But, if actual cost is less than the standard cost, it is favorable variance.

There are many variances used in practice, but the cost variances may be broadly classified as shown below.

Variances can be presented in the form of a chart as follows:

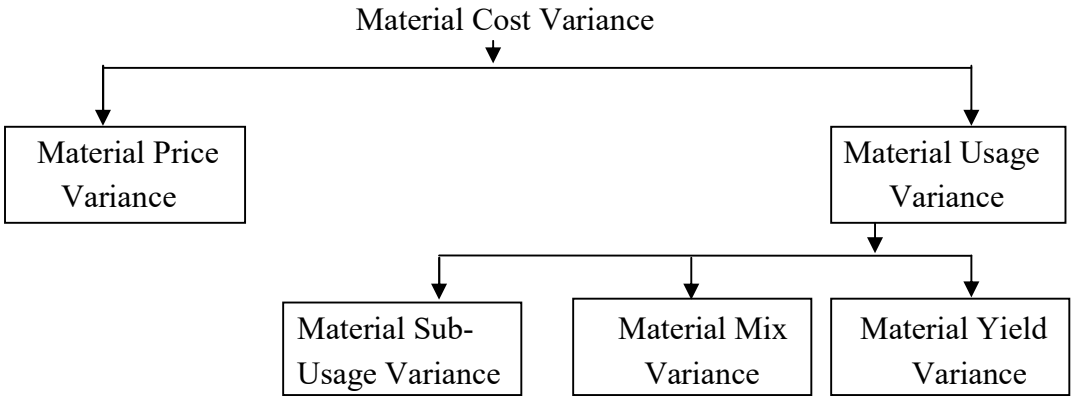


1) Material Cost Variance	2) Labour Cost Variance	1) Fixed Overhead Variance:	1) Variable Overhead Expenditure Variance
2) Material Price Variance	2) Labour Rate Variance	2) Expenditure Variance	2) Variable overhead Efficiency Variance
3) Material Usage Variance	3) Labour Effciency Variance	3) Volume Variance	
4) Material Mix Variance	4) Labour Mix Variance	4) Efficiency Variance	
5) Material Yield Variance	5) Idle Time Variance	5) Capacity Variance	
		6) Calendar Variance	

3.2.6 Material Variances

When the standard for cost of raw materials is established and the actual cost of materials turns out to be more or less, the difference is known as Material Cost Variance. This variance consists of two variances on the basis of price and use. They are (i) Material Price Variance and (ii) Material Usage Variannce.

Besides, the Material Usage Variance consists of three variance (1) Material Mix Variance (2) Material Sub-usage Variance and (3) Material Yield Variance. Thus the following Variance relate to material cost.



We discuss below these variance in detail:

(1) Material Cost Variance: As we have seen above, it is the difference between the standard cost of materials and the actual cost of materials used e.g. suppose, the standard cost of material for manufacturing one unit of a product is 100 kg. @ Rs. 5 per kg. i.e. Rs. 500. If the actual material used is 110 kilos at Rs. 6 per kg. then the material cost would be Rs. 660. It means that the actual material cost is Rs. 160 more than the standard fixed. This difference of Rs. 160 is called Material Cost Variances. As the actual cost is more than the standard, the variance is 'Unfavourable' or 'Adverse'. It is also known as 'Red' Variance. If the actual expense turns out to be less than the standard, then the variance will be 'Favourable'. It is also known as 'Black' Variance.

The above calculation can be presented as follows:

Material Cost Variance = (Standard Quantity × Std. Price)

- (Actual Qty. × Actual Price)

= (100 × Rs. 5) – (100 × Rs. 6)

= Rs. 500 – Rs. 660

= - 160 (U)

Here (U) written in bracket suggests unfavourable variance. In fact, the Standard Quantity written in the first bracket is the Standard Quantity of actual production. Hence the formula may be written as

Material Cost Variance = (Std. Qty. of Actual Output × Std. Price)

- (Actual Qty. × Actual Price)

$$= (SQ \times SP) - (AQ \times AP)$$

or = Standard Cost – Actual Cost

There are two causes of unfavorable material cost variance viz. (i) Price difference and (ii) difference in usage i.e. Quantity of materials used.

Accordingly, Material Cost Variance can be divided into (i) Material Price Variance and (ii) Material Usage Variance.

(i) Material Price Variance: When the actual price paid for the material is more or less than the standard price specified, the difference is known as Material Price Variance. When the actual material is issued for production it is charged at standard price and the difference i.e. the variance is transferred to price variance account. The formula for material price variance is as follows:

Material Price Variance = Actual Quantity (Std. Price – Actual Price)

$$= AQ (SP- AP)$$

This formula suggests that price variance is obtained by multiplying the price difference by actual quantity. Here, price difference = Std. Price – Actual Price.

Illustration 1:

A Co. Ltd. has fixed standard usage of material at 100 kg. at Rs.5 per kg. But the actual usage was 110 kg. at 6 per kg. Calculate Material Price Variance.

Solution:

Material Price Variance = Actual Qty. (Std. Price – Actual Price)

$$= AQ (SP - AP)$$

$$= 110 \text{ kgs. (Rs. 5 – Rs. 6)}$$

$$= 110 \times -1$$

$$= -110 (U)$$

It means that material cost increased by Rs. 110 due to change in the price of materials used.

Here the price difference is Rs. 5 – Rs. 6 = -Re. 1 and it is multiplied by actual quantity of 110 kgs. 110 × -1 = -110.

The following are the causes of material price variance;

1) Change in the basic price of raw material.

2) Loss of discount due to purchase of material in smaller quantity or uneconomic size.

3) Loss of cash discount because of non-payment in specified time.

4) Payment of excess freight or purchase from a distant supplier.

5) Purchase of goods of different quality.

6) Inefficiency of purchase department.

7) Purchase of some substitute at a higher or lower price.

8) Changes in government taxes or duties.

Generally, the purchase officer is answerable for the material price variance. He may sometimes be called upon to prepare a report on analysis of causes of price variance. Sometimes, the price situation may be beyond the control of purchase officer e.g. when the prices are rising continuously in the market or due to lack of cash resources, the benefit of cash discount may have been lost. Even in such circumstances the price variance analysis provides a useful guide for taking measures to maintain the targeted profit.

(ii) Material Usage Variance: When the actual quantity of materials used in production differs from the standard quantity specified, the difference in the cost is called Material Usage Variance. As we have seen, the material is charged to production at standard price, the material usage variance is calculated at standard price. e.g. in the above illustration the standard usage was 100 kgs. but the actual quantity used is 110 kgs. which means that the excess material used is 10 kgs., which is priced at Rs. 5 per kgs. comes to Rs. 50 i.e. the material usage variance is Rs. 50. It is calculated as follows:

Material Usage Variance = Std. Price (Standard Quantity – Actual Quantity)

= SR (SQ - AQ)

= Rs. 5 (100 kg. – 110 kg.)

= Rs. 5 × 10

= - 50 (U)

Now let us tally the variance. The total material cost variance is Rs. 160 (U) which arises due to excess two reasons; one, increase of Rs. 110 is due to the price and increase of Rs. 50 is due to excess usage of material.

Material Cost Variance = Price Variance + Usage Variance

= Rs. 110 (U) + Rs. 50 (U)

= 160 (U)

The following are generally, the causes of material usage variance:

1) Use of inferior quality goods or defective materials.
2) Carelessness in usage of material.
3) Theft or pilferage of materials.
4) Inefficiency in production leading to greater wastage.
5) Strict inspection leading to higher rejections.
6) Change in design or specifications.
7) More or less yield from the materials used.
8) Defective standards of yield or usage.
9) Change in mixture of different materials.

The analysis of this variance may help in locating responsibility for more consumption of materials and in taking corrective steps.

Illustration 2:

A factory has implemented standard costing. The standard of usage fixed for production of 1,000 units of a product is 400 kg. at a price of Rs. 2-50 per kg. 2,000 units were manufactured, it was found that 820 kgs. of materials were used at Rs. 2.60 per kg.

Calculate Materials Variances.

Solution:

We shall calculate three material variances in this example:

1) Material Cost Variance 2) Material Price Variance and 3) Material Usage Variance.

1) Material Cost Variance = (Std. Qty. × Std. Price) – (Actual Qty. × Actual Price)

= (800 × 2.50) – (820 × 2.60)

= Rs. 2,000 – Rs. 2,132

= -132 (U)

This shows that the Material Cost has increased by Rs. 132. This increase is due to two reasons (1) There is a difference in material price and also 2) The actual use of material is more.

2) Material Price Variance = Actual Quantity (Std. Price – Actual Price)

= 820 kgs. (Rs. 2.50 - Rs. 2.60)

= 820 x - 0.10

= - 82 (U)

This calculation shows that the material cost has increased by Rs. 82 due to increase in the price of material. Hence it is unfavourable and is denoted by (U). Had the price declined, the variance would have been favourable and would be denoted with + i.e. (F).

(3) Material Usage Variance = Standard Price (Std. Qty. - Actual Qty.)

= Rs. 2.50 (800 - 820)

= 2.50 x - 20

= - 50 (U)

This suggests that the material cost has increased by Rs. 50 due to increase in use of material. This is unfavourable or adverse variance. Material Cost Variance = M. Price Variance + M. Usage Variance

= - 82 - 50

= - 132 (U)

Illustration 3 :

In a factory, it is estimated that for the use of 1 ton of materials, 100 units are manufactured. The standard price of material is Rs. 10. During August, 2015, 100

tons of material was issued to production at Rs. 10-50 per ton. Actual production was 10,250 units.

Calculate : 1) Material Cost Variance 2) Material Price Variance 3) Material Usage Variance.

Solution :

: Let us find out standard quantity for actual production.

For 100 units 1 ton is used

∴ 10,250 units (?) $\frac{10,250}{100}$ = 102.5 tons

1) **Material Cost Variance** = (Std. Qty. of Actual Prod. x Std. Price)

= - (Actual Qty. x Actual Price)

= (102.5 x Rs. 10) – (100 x Rs. 10.50)

= Rs. 1,025 – Rs. 1,050

= - 25 (U)

2) Material Price Variance = Actual Qty. (Std. Price – Actual Price)

= 100 ton (10 – 10.50)

= 100 x 0.50

= - 50 (U)

3) Material Usage Variance = Std. Price (Std. Qty. – Actual Qty.)

= Rs. 10 (102.5 - 100)

= 10 x 2.5

= + 25 (F)

Illustration 4 :

Calculate : A) Material Cost Variance, B) Material Price Variance, C) Material Usage Variance from the following data.

Purchase of Material	6,000 units
Cost of Purchase of Material	Rs. 24,000

For Production of 1 ton,

Standard quantity of material required	50 units
Standard Price	Rs. 3.50 per unit
Closing stock of material	1,000 units
Actual production	95 ton

Solution :

A) Let us find out Standard Quantity for actual production.

1 Ton Production = 50 Units

for 95 Production ? $\frac{50x9}{1}$ = 4,750 units

Let us Find out Actual Material used :

Purchase of Material	6,000 units
Less : Closing stock	1,000 units
Actual usage	5,000 units

1) Material Cost Variance = (Std. Qty. of Actual Prod. x Std. Price)
- (Actual Qty. x Actual Price)
= (4,750 units x Rs. 3.50) – (5,000 x Rs. 4)
= Rs. 16,625 – Rs. 20,000
= - 3,375 (U)

2) Material Price Variance = Actual Qty. (Std. Price - Actual Price)
= 5,000 (3.50 – 4.00)
= 5,000 x – 0.50
= - 2,500 (U)

3) Material Usage Variance = Std. Price (Std. Qty. – Actual Qty.)
= Rs. 3.50 (4,750 – 5,000)
= Rs. 3.50 x -250
= - 875 (U)

iv) Material Mix Variance : In some industries two or more materials are used in the production of a single commodity in a fixed proportion. The budgeted mixture of two or more materials in called standard material mix. If actual mix is different from the standard mix for any reason, then there will arise material cost variance, which is known as material mix variance. In short, material mix variance refers to the difference between actual material mix and standard material mix. For instance, suppose materials A and B both are used in the production of a product. Their relative proportion is as follows:

A 20 kgs. at the price of Rs. 5 per kg.	= Rs. 100
B 30 kg. at the price of Rs. 2 per kg.	= Rs. 60
Total material 50 kg	Rs. 160

Suppose, actually 25 kg of A and 25 kg. of B have been used in production. In that case material cost will be as under:

A	25 kg x Rs. 5	= Rs. 125
B	25 kg x Rs. 2	= Rs. 50
Total	50 kg	Rs. 175

Thus and adverse variance of Rs. 15 (Rs. 175 – Rs. 160) has arisen. Rs. 150 will be debited to production while Rs. 15 will be debited to material mix variance account.

Note that two types of situations have be to considered to find out the material mix variance.

a) When standard weight and actual weight of the material mix are equal:

For instance the standard quantity of material A is 40 kg and that of material B is 30 kg. Hence, the weight of the standard mix is 70 kg.

Now, if actual quantity used of A is 45 kg and that of B is 25 kg. Hence actual weight of the mix is 70 kg. which is the same as standard weight. In this case, variance can be obtained with the help of following formula:

Material Mix Variance = Standard Price (Standard Mix - Actual Mix)

= SP (SM - AM)

Illustration 5 :

Find out material mix variance from the following information taken from cost accounts of a factory:

	Standard	Actual
Material		
A	60 kg at Rs. 5 per kg.	70 kg at Rs. 5 per kg.
B	50 kg. at Rs. 6 per kg.	40 kg. at Rs. 6.20 per kg.
	110 kg.	110 kg.

Solution :

On the basis of the data given above, it is seen that the weight of the standard material mix is 110 kg. and actual weight is also 110 kg. Hence, following formula can be used:

Material Mix Variance = Std. Price (Std. Mix – Actual Mix.)

A = Rs. 5 (60 – 70 kg)

= Rs. 5 (-10 kg.)

= - Rs. 50 (U)

B = Rs. 6 (50 – 40 kg.)

= Rs. 6 (10 kg)

= Rs. 60 (F)

∴ Mix Variance = 50 + 60 = Rs. + 10 (F)

Note : When the total weight of actual mix equals the total weight of standard mix and yet there arises a mix variance, it will be treated as material mix variance and the usage has neither increased nor decreased. Hence, we need not calculate material usage variance in such cases. Also, the formula of material mix variance is the same of material usage variance in such case.

Illustration 6 :

Two material X and Y are used in the production of a commodity in a factory. The information about its production in August, 2015 is as under:

Standard Material Mix : X 100 kg at Rs. 30 per kg.	Rs. 3,000
Y 50 kg at Rs. 12 per kg.	Rs. 600
150 kg.	Rs. 3,600

Actual Material Mix :	X 110 kg. at Rs. 32	Rs. 3,520
	Y 40 kg. at Rs. 11	Rs. 440
	150 kg.	Rs. 3,960

Compute Material Variances.

Solution:

In this case, two variances are self evident : firstly, there is a difference in the standard rate and actual rate for both materials, and hence the price variance arises. Secondly their relative amounts in the actual mix is also different. This gives rise to mix variance. No doubt, the quantity of actual mix is same as the quantity of standard mix. Therefore Material mix variance can be calculated on the basis of the above formula.

1) Material Cost Variance = Standard Cost – Actual Cost = (SQ x SP) – (AQ x AP)

= Rs. 3,600 – Rs. 3,960

= - Rs. 360 (U)

There are two parts of material cost variance:

2) Material Price Variance = Actual Qty. (Std. price – Actual Price)

X = 110 (Rs. 30 – Rs. 32)

= - Rs. 220 (U)

Y = 40 (Rs. 12 – Rs. 11)

= + Rs. 40 (F)

Total Material Price Variance = -220 + 40 = - Rs. 180 (U)

3) Material Mix Variance = Std. Price (Std. Mix – Actual Mix)

X = Rs. 30 (100 kg. – 110 kg.)

= Rs. 30 (-10)

= - Rs. 300 (U)

Y = Rs. 12 (50 kg – 40 kg.)

= Rs. 12 (10 kg)

= + Rs. 120 (F)

Total Material Mix Variance = - 300 + 120

= - Rs. 180 (U)

b) When the weight of standard Mix and weight of Actual mix are unequal: In this case too the above formula is to be applied, but the standard quantity needs to be revised. The formula will be as follows:

∴ Material Mix Variance = SP (Revised SM - AM)

Here, Revised Mix $= AQ \times \frac{\text{Standard Quantity of One Material}}{\text{Total Standard Quantity}}$

$= TAQ \times \frac{SQ}{TSQ}$

Where, SQ = Standard quantity of one material

TAQ = Total actual quantity

TSQ = Total standard quantity.

We may clarify this point with the help of an example.

Illustration 7 :

Calculate material mix variance in a factory on the basis of the data given below:

Material	Actual	Standard
A	120 units at Rs. 10 per unit	150 units at Rs. 10
B	180 units at Rs. 8 per unit	180 units at Rs. 9
	300 units	330 units

Solution:

In the above case, standard mix is 300 units, while actual mix is 330 units. Hence standard mix should be revised.

Revised standard Mix $= \text{TAQ} \times \frac{\text{SQ of one material}}{\text{TSQ}}$

A $= 330 \text{ units} \times \frac{120}{300} \text{ units} = 132 \text{ units.}$

B $= 330 \text{ units} \times \frac{180}{300} \text{ units} = 198 \text{ units.}$

Now, apply the formula.

Material mix variance = Std. Price (Revised Std. Mix – Actual Mix)

A = Rs. 10 (132 units – 150 units)

= Rs. 10 (-18 units)

= - Rs. 180 (U)

B = Rs. 8 (198 units – 180 units)

= Rs. 8 x 18 units

= Rs. 8 x 18 units

= + Rs. 144 (F)

∴ **Total Mix Variance** = - 180 + 144

= - Rs. 36 (U)

Two other variances in the above example are : 1) material price variance and 2) material usage variance.

These two variances can be computed as follows:

Material Price Variance = AQ (SP - AP)

A + B = 150 (10-10) + 180 (8-9)

= 0 + (-180)

= - Rs. 180 (Adverse)

Material Usage Variance = SP (SQ - AQ)

A + B = Rs. 10 (120 – 150 units) + Rs. 8 (180 - 180)

= Rs. 10 x 30 + 0

= - Rs. 300 (A)

The total of these two variances will give material cost variance.

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

= (10 x 120 + 8 x 180) – (10 x 150 + 9 x 180)

= (1200 + 1440) – (1500 + 1620)

= Rs. 2640 – Rs. 3120

= - Rs. 480 (A)

Note: Material mix variance is a part of material usage variance. Hence it is not taken into account while tallying the total variances.

v) Material Sub- usage Variance: In the above example, total usage variance is Rs. 300, while mix variance is Rs. 36. What, then, about Rs. 264? That is material sub-usage variance. When the sum of standard mix is not equal to the sum of actual mix, material sub-usage variance arises. It means that the quantity used has also increased or decreased. So there are two reasons for Material usage variance i) Mix has changed ii) More quantity is used. It is calculated in the following manner:

Material Sub- usage Variance = Std. Price (Std. Mix – Revised Std. Mix)

A = Rs. 10 (120 kg – 132 kg)

= Rs. 10 (-12)

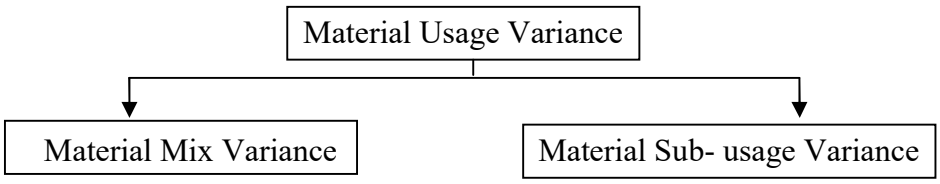
= - Rs. 120 (U)

B = Rs. 8 (180 kg. – 198 kg)

= Rs. 8 (-18)

= - Rs. 144 (U)

Total Rs. 264 (U)



iv) Material Yield Variance: If, for any reason, actual yield (actual good units produced) of a given amount of material is different from the standard yield, this difference is known as material yield variance. Generally, in the processing

industries where some wastage of material is inevitable, the problem of material yield variance arises.

Here, too when standard mix and actual mix are equal, following formula is to be used:

Material Yield Variance = Standard cost per unit (Actual Yield- Standard Yield)

Per unit standard cost can be obtained by dividing total standard cost by total standard output.

$$\text{Cost per unit} = \frac{\text{Total Standard Cost}}{\text{Total Standard Output}}$$

Illustration 8 :

Calculate Material Yield variance from the following information.

Material standard price	: Rs. 13.50 per kg.
Actual standard Quantity	: 2,000 kg.
Normal loss	: 10%
Actual Production	: 1,700 kg.

Solution:

First we find out standard cost per unit

$$\text{Standard cost per unit} = \frac{\text{Total Standard Cost}}{\text{Total Standard Output (Yield)}}$$

= Std. Qty. x Std. Price

= 2,000 kg. x Rs. 13.50

= Rs. 27,000

= Std. Qty. – Normal Loss

= 2,000 kg. – 200 kg. loss (10% of 2,000)

= 1,800 kg.

$$\therefore \quad \textbf{Standard cost per unit} = \frac{\text{Rs.27,000}}{\text{1,800 kg.}} = \text{Rs. 15}$$

Material Yield Variance = Std. cost per unit (Actual Yield – Std. Yield)

= Rs. 15 (1,700 kg. – 1,800 kg.)

= Rs. 15 x -100

= - 1,500 (U)

Remember that in all other variances worked out above, we were writing Standard amount first in the bracket. But here Actual yield is written first. This is because it is a credit item, whereas in other variances, there were debit items of expenses. If we want to write standard item first, even in this variances, the formula will be changed. Instead of yield, we write wastage in the bracket.

Material Yield Variance = Standard cost per unit (Std. Wastage – Actual Wastage)

= Rs. 15 (200 kg. – 300 kg.)

= Rs. 15 x -100

= - Rs. 1,500

Illustration 9:

In a factory, the standard production during April, 2024 was fixed at 180 kgs. for which standard cost was as follows:

Material O :	120 kg. per Rs. 10	Rs. 1,200
Material P :	80 kg. per Rs. 50	Rs. 4,000
	200 kg.	Rs. 5,200
Less : 10 % loss	20	-
	180 kg. Production	Rs. 5,200

Details about actual production were as follows:

Material O	130 kg. per Rs. 12	Rs. 1,560
Materials P	70 kg. per Rs. 50	Rs. 3,500
	200 kg. production	Rs. 5,060
Less: Loss	30 kg.	-
	170 kg.	Rs. 5,060

Calculate Material Variances

Solution :

First we shall calculate price variance. But in case of P there seems to be no price difference. Hence we shall find out price variance for O only.

A) Material Price Variance = Actual Qty. (Std. Price – Actual Price)

= 130 (Rs. 10 – Rs. 12)

= 130 (- Rs. 2)

= - 260 (U)

Now are shall find out mix variance. As the quantity of standard mix and quantity of actual mix are the same, there is no need to find out revised standard mix.

B) Material Mix Variance = Std. Price (Std. Mix – Actual Mix)

For O = Rs. 10 (120 kg. – 130 kg.)

= - Rs. 100 (U)

For P = Rs. 50 (80 kg. – 70 kg)

= Rs. 50 x 10

= + Rs. 500 (F)

∴ Total Mix Variance = - Rs. 100 + Rs. 500 = Rs. 400 (F)

C) Material Yield Variance = SC (AY - SY)

Now per unit standard Cost $= \frac{\text{Standard Cost}}{\text{Standard Yield}}$

$= \frac{5,200}{180}$ = Rs. 28.9

∴ Yield Variance = Rs. 28.9 (170 kg. – 180 kg.)

= 28.9 (-10)

= - Rs. 289 (U)

Now we shall calculate Material cost variance.

D) Material Cost Variance = (Std. Qty. x Std. Price) – (Actual Qty. x Actual Price)

= (170 kg. x 28.9) – Rs. 5,060

= - 149 (U)

Verification :

Material Cost Variance = Price Variance + Mix Var. + Yield Variance

= -260 + 400 – 289

= -149 (U)

Illustration 10 :

The standard cost of a certain chemical mixture is as follows:

40% Material A at Rs. 20 per ton.

60 % Material B at Rs. 30 per ton.

A standard loss of 10 % is expected in production. During one month 171 ton is produced and 90 tons of Material A at Rs. 18 per kg. and 110 tons of Material B at Rs. 34 is used.

Calculate : 1) Material Price Variance 2) Material Mix Variance 3) Material Yield Variance.

Solution:

1) First we shall find out standard quantity of material for actual production of 171 tons. If 100 tons of material are used, then at 10 % standard loss, we get standard output of 90 tons.

For 90 tons production = 100 tons materials used

∴ For 171 tons of actual prod. = (?) $\frac{100 \text{ x } 171}{90}$ = 190 tons

2) We find out standard quantity of 190 tons

A 40% = 190 tons x $\frac{40}{100}$ = 76 tons: B 60% = 190 x $\frac{60}{100}$ = 114 tons

1) Material Cost Variance = (Std. Qty. x Standard Price) – (Actual Quantity x Actual Price)

A = (76 tons x Rs. 20) – (90 tons x Rs. 18)

= 1,520 – 1,620= -100

B = (114 tons x Rs. 30) – (110 tons x Rs. 34)

= 3,424 – 3,740 = -320

Total -420 (U)

2) Material Price Variance = Actual Quantity (Std. Price – Actual Price)

A = 90 tons (Rs. 20 – Rs. 18) = +180

B = 110 tons (Rs. 30 – Rs. 34) = - 440

-260 (U)

Std. Mix = 90 tons + 110 tons = 200 tons

A = 200 tons x 44% = 80 tons

B = 200 tons x 60% = 120 tons

3) Material Mix Variance = Std. Price (Std. Mix – Actual Mix)

A + B = Rs. 20 (80-90) + Rs. 30 (120 - 110)

= (20 x -10) + (30 + 10)

= -200 + 300

= + 100 (F)

Std. Qty. = A 80 x Rs. 20 = Rs. 1,600

B 120 x Rs. 30 = Rs. 3,600

Std. cost = Rs. 5,200

Std. Yield = Actual Quantity – Std. Loss

= 200 units – 10% loss 20 units = 180 units

∴ Per unit std. cost = $\frac{\text{Std.Cost}}{\text{Std Yield}}$

= $\frac{5,200}{180}$ = Rs. 28.89

4) Material Yield Variance = Std. cost (Actual Yield – Std. Yield)

= Rs. 28.89 (171 - 180)

= 28.89 x -9

= -260 (U)

5) Material Cost Variance = Price Variance + Mix Variance + Yield Variance

= -260 + 100 – 260

= -420 (U)

Illustration 11:

The Standard mix of product 'M' is as follows:

Material	Kgs.	Price per Kg. Rs.
A	50	5-00
B	20	4-00
C	30	10-00

The standard loss in production is 10% of the input. There is no scrap value.

Actual production of product M was 7,200 kgs.

Actual consumption of material and cost were as follows:

Material	Kgs.	Price per Kg. Rs.
A	4,160	5-50
B	1,680	3-75
C	2,560	9-50

You are required to calculate the following variances:

i) Material cost variance ii) Material price variance

iii) Material usage variance iv) Material Mix variance

v) Material Yield variance

Solution:

First of all we shall find out std. quantity for actual output.

Here actual output is 7,200 kgs. while std. loss is 10%

If the output is Std. quantity

90 kgs. = 100 kg.

∴ 7,200 kgs. (?)

= $7{,}200 \times \frac{100}{90} = 8{,}000$ Std. quantity

The standard quantity for each type of material:

For A = 8,000 kg. x $\frac{50}{100}$ = 4,000 kgs.

B = 8,000 kg. x $\frac{20}{100}$ = 1,600 kgs.

C = 8,000 kg. x $\frac{30}{100}$ = 2,400 kgs.

8,000 kgs.

Now we shall calculate necessary variances.

1) Material Cost Variance = (Std. Quantity x Standard Price) – (Actual Quantity x Actual Price)

A = (4,000 kg. x Rs. 5) – (4,160 x 5.50)

= 20,000 – 22,880

= - 2,880 (U)

B = (1,600 kg. x Rs. 4) – (1,600 x Rs. 3.75)

= 6,600 – 6,300

= + 100 (F)

C = (2,400 kg. x Rs.20) – (2,560 x 9.50)

= 24,000 – 24,320

= -320 (U)

= - 2,880 + 100 – 320

Total Variance = -3,100 (U)

2) Material Price Variance = Actual Quantity (Std. Price – Actual Price)

= A 4,160 (5 – 5.50) + B 1,680 (4-3.75) + C 2,560 (10-9.50)

= (4160 x 0.50) + (1,680 x 0.25) + (2560 x 0.50)

= - 2,080 + 420 + 1,280

= - 380 (U)

3) Material Usage Variance = Std. Price (Std. Qty. – Actual Qty.)

= A 5 (4,000 – 4,060) + B 4 (1,600 – 1,680) + C 10 (2,400 – 2,560)

= - 800 – 320 - 2,560

= - 2,720 (U)

4) Material Mix Variance:

For computing mix variance, it is necessary to find out revised std. mix, because the total standard quantity is 8,000 kgs. while the total actual quantity is 8,400 kgs. (4,160 + 1,680 + 2,560).

∴ Revised Std. mix

A = 8,400 x $\frac{4,000}{8000}$ = 4,200 kgs.

B = 8,400 x $\frac{1,600}{8000}$ = 1,680 kgs.

C = 8,400 x $\frac{2,400}{8000}$ = 2,520 kgs.

8400 kgs.

Material Mix Variance = Std. Price (Revised Std. Mix – Actual Mix)

= 5 (4,200 – 4,160) + 4 (1,680 – 1,680) + 10 (2,520 – 2,560)

= 200 + Zero - 400

= - 200 (U)

Material Yield Variance –

Std. Cost per unit

A	4,000 kgs. x Rs. 5	= 20,000
B	1,600 kgs. x Rs. 4	= 6,400
C	2,400 kgs. x Rs. 10	= 24,000
	8,000	50,400
Less 10% Loss	800 kgs.	-
	7,200 kgs.	50,400

Per unit Std. Cost $= \frac{50,400}{7,200} = $ Rs. 7

Revised Std. Yield = Actual Qty. – Std. Loss

= 8,400 – 840 = 7,560 kgs.

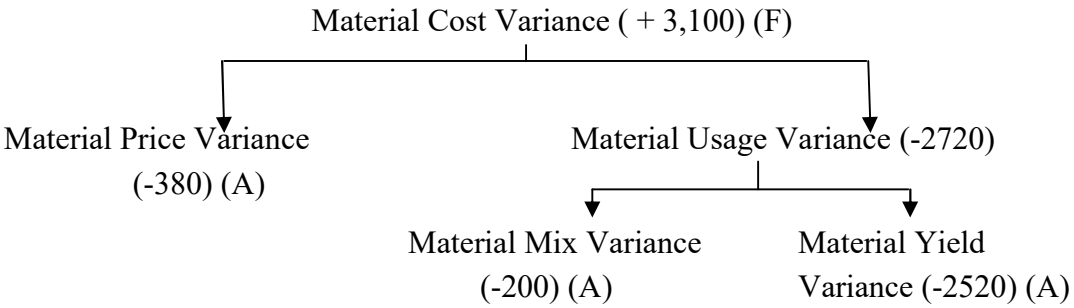
5) Material Yield Variance = Std. Cost (Actual Yield – Revised Std. Yield)

= Rs. 7 (7,200 – 7,560)

= Rs. 7 x – 360

= - 2,520 (U)

Verification :



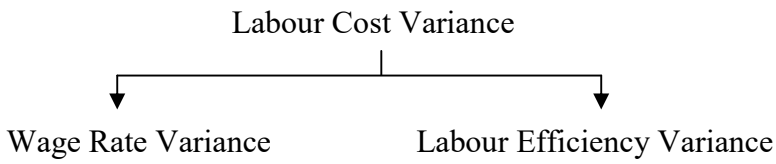
Material Variances

1	**Material Cost Variance**	(SQ x SP) – (AQ x AP) (Std. Quantity x Standard Price) – (Actual Quantity x Actual Price)
2	**Material Price Variance**	AQ (SP - AP)
3	**Material Usage Variance**	SP (SQ - AQ)
4	**Material Mix Variance:** a) When standard mix quantity and actual mix quantity are equal. b) When they are unequal.	SP (SM - AM) SP (RSM - AM) RSM = Revised Standard Mix

		= AQ x $\frac{\text{SQ of one material}}{\text{TSQ}}$
5	**Material Sub- Usage Variance** When standard mix quantity and actual mix quantity are unequal.	SP (SQ - RSQ)
6	**Material Yield Variance** When standard mix quantity and actual mix quantity are unequal.	Per unit standard cost (AY SY) Per unit standard cost (Standard loss - actual loss) where standard cost = total standard Price ÷ SQ Per unit standard cost (AY - RSY) Where RSY = AQ introduced – loss at the standard rate

3.2.7 Wage or Labour Variances:

If the actual wages are more or less than the standard amount of wages fixed, then the difference is the labour variance. There are two reasons for labour cost variances : 1) The wage rate actually paid may differ from wage rate fixed (standard wage rate). This is wage rate variance. 2) The workers may take more time or less time. Then the time fixed and as a result the wage cost may increase or decrease. This is called Labour Efficiency Variance. Thus labour variances are mainly two.



The formulas for labour variances can be derived from the formulas for material variances. If we write wage rate in place of 'price' in case of material price variance,

we get labour rate variance. But in place of material quantity, we have to write labour hours.

Similarly, if we write actual hours instead of actual quantity in Material usage variance, we get Labour Efficiency variance.

i) Labour Cost Variance: It is the difference between standard labour cost and actual labour cost. This is total labour cost variance. It is obtained as follows:

Labour Cost Variance = (Standard Wage Rate x Standard Hours)
- (Actual Wages Rate x Actual Hours)
= Standard Labour Cost – Actual Labour Cost

Illustration 12 :

Standard wage rate is Rs. 2 per hour and standard time is 10 hours. But actual wage rate is Rs. 2.25 per hour and actual hours used are 12 hours.

Calculate labour cost variance.

Solution:

Labour Cost Variance = (Std. Rate x Std. Hours) – (Actual Rate x Actual Hours)
= (SR x SH) – (AR x AH)
= (Rs. 2 x 10) – (RS. 2.25 x 12)
= Rs. 20 – Rs. 27
= - Rs. 7 (U)

Here labour variance is adverse or unfavorable because actual labour cost exceeds standard labour cost by Rs.7

ii) Wage Rate Variance: Standard labour cost is calculated on the basis of standard wage rate. But if more efficient and skilled workers are required, then it becomes necessary sometimes to pay higher wage rate than the standard one. Hence actual labour cost will rise. It is very useful to differentiate between various labour cost variance according to the difference in their causes. More particularly, the labour cost variance arising out of the controllable factors must be separated from the labour cost variance caused by some uncontrollable factors. For example, suppose standard time of a job is 10 hours and standard wage rate is Rs. 2 per hour. If,

however, actually 12 hours are taken on the job and if workers are actually paid at the wage rate of Rs. 2.25 per hour, the labour cost will be up by Rs. 3 due to the fact that for each hour used up in production, 25 paise more have been paid to the laboures (25 paise x 12 hours = Rs. 3.00) This is known as Wage Rate Variance. It is just like material price variance.

Wage Rate Variance = Actual Hours (Std. Rate – Actual Rate)

= AH + (SR - AR)

Illustration 13 :

Calculate labour cost variance and wage rate variance from the following information:

Standard production	: 200 units
Standard hours	: 1,000 hours
Wage rate per hour	: Rs. 4
Actual production	: 170 units
Actual time taken	: 900 hours
Actual wage rate paid	: Rs. 4.20 per hour

Solution:

Actual production is 170 units, for which standard hours will have to be calculated, because we are required to multiply wage rate per hour with standard hours of actual production.

Std. time for one unit = 1,000 hours ÷ 200 units = 5 hours

∴ Std. hours for actual production 170 units = 170 x 5 = 850 hours.

Labour Cost Variance = (Std. Hours of Actual Prod. x Std. Rate) - (Actual Hours x Actual Rate)

= (850 Hours x Rs. 4) – (900 Hours x Rs. 4.20)

= Rs. 3,400 – Rs. 3,780

= Rs. -380 (U)

Wage Rate Variance = Actual Hours (Standard Rate – Actual Rate)

= 12 hours (Rs. 2.00 – Rs. 2.25)

= 12 hours (-Rs. 0.25) – Rs. 3 (U)

Some of the causes of wage rate variances are as follows:

1) A change in the method of wage payment, e.g piece wage system may be substituted for time wage system.

2) If workers are guaranteed daily wage, it must be paid irrespective of whether they complete a standard task or not.

3) Newly required workers may not be paid full amount.

4) A change may be introduced in the structure of wages e.g. a new scale may be introduced in response to the tribunal's award.

5) Workers may be paid for overtime work which may not have been taken into account while calculating the standard rate.

6) The workers employed actually may be more or less skilled than anticipated.

7) The workers employed on temporary basis may be more or less than the standard rate.

A this point, it is important to note that in most cases wage rate is beyond the control of management. It is determined by the market forces of demand and supply in the labour market or by the tribunal award or by the government ligislation.

Illustration 14 :

The data about wages paid in a factory is as follows:

Type	**Standard**	**Actual**
Skilled	200 hours at Rs. 2	210 hours at Rs. 2.20
Semi-skilled	200 hours at Rs. 1.50	190 hours at Rs. 1.40

Calculate wage rate variance.

Solution:

Wage Rate Variance = Actual Hours (Standard Rate – Actual Rate)

Skilled = 210 Hours (Rs. 2.00 – Rs. 2.20)

= 210 x –Rs. 0.20

= -Rs. 42 (U)

Semi- skilled = 190 Hours (Rs. 1.50 – Rs. 1.40)

= 190 x 0.10

= + 19 (F)

Total Variance = -42 + 19 = -21 (U)

iii) Labour Efficiency Variance: A worker is expected to produce a standard quantity of output during standard period of time. If actually he produces more or less than the standard quantity within the standard time, a labour cost variance emerges which is known as labour efficiency variance. This can be calculated as follows:

Labour Efficiency Variance = Standard Rate (Standard Hours – Actual Hours)

= SR (SH - AH)

Note : Standard hours taken here are that of actual production.

As in the above example, if standard output is one unit during 10 hours in a factory and standard rate is Rs. 2.00 per hour, but if actually 12 hours are taken and actual rate paid is Rs. 2.25 per hour, then labour efficiency variance will be as follows:

Labour Efficiency Variance = Standard Rate (Std. Hours – Actual Hours)

= SR (SH- AH)

= Rs. 2.00 (10 hours – 12 hours)

= - Rs. 4 (U)

In this case, a labourer taken 12 hours instead of 10 hours as expected in producing a unit of the product. He turns out to be less efficient than expected. Consequently labour cost has increased by Rs. 4 (Rs. 2 x 2 hours). If follows that labour efficiency variance is just like material usage variance.

In the above example, total labour cost has gone up by Rs. 7.00 of this, increase in cost of Rs. 3.0 has been caused by an increase in wage rate, while increase in cost of Rs. 4.00 has been the result of low labour efficiency.

Thus, Labour Cost Variance = Wage rate variance + Labour efficiency variance

= - Rs. 3 – Rs. 4

= -Rs. 7 (U)

Some of the causes responsible for labour efficiency variance are inefficiency of workers, defective machines and equipment, incompetence of the supervisor, defective planning, irresponsible inspection and unfavorable working conditions in the factory etc.

Illustration 15:

The data regarding labour cost of production in February 2001 in a factory is as follows:

Actual direct wages paid	Rs. 26,240
Standard hours	8,640
Standard wage rate per hour	Rs. 3.00
Actual hours	8,200

Calculate labour cost variances

Solution:

Actual wage rate per hour = $\frac{\text{Actual Wages Paid}}{\text{Actual Hours}}$

$= \frac{26,240}{8,200}$ = Rs. 3.20

1) **Labour Cost Variance** = SLC – ALC

= Std. Labour Cost - Actual Labour Cost

= (Std. Hours x Std. Rate) – (Actual Hours x Actual Rate)

= (8640 x Rs. 3) – Rs. 26,240

= Rs. 25,920 - Rs. 26,240

= - Rs. 320 (U)

This labour variance is made up to two variances: wage rate variance and labour efficiency variance.

2) Wage Rate Variance = Actual Hours (Std. Rate – Actual Rate)

= 8,200 (Rs. 3.00 – Rs. 3.20)

= 8,200 (- Rs. 0.20)

= - Rs. 1640 (U)

3) **Labour Efficiency Variance** = Std. Rate (Std. Hours – Actual Hours)

= Rs. 300 (8640 - 8200)

= Rs. 3.00 x 440

= Rs. 1,320 (F)

Labour Cost Variance = Wage Rate Variance + Labour Efficiency Variance

= - 1,640 + 1,320

= - Rs. 320 (U)

Illustration 16:

Data about a company for March, 2015 are as follows:

Total Direct Labour	Rs. 4,320
Direct Standard Hours	2,000 hours
Standard wage rate per hour	Rs. 2
Actual paid hours	1,800 hours
Abnormal Idle Time	80 hours

Solution:

Let us calculate actual wage rate per hour in this case.

Actual wage rate per hour $= \frac{\text{Actual Total Payament}}{\text{Actual hours}}$

$= \frac{\text{Rs.4,320}}{\text{1,800}}$

= Rs. 2.40

1) **Labour Cost Variance** = Standard wage rate for std. time
– Actual wage rate for actual time
= (2,000 hours x Rs. 2) – (1,800 hours x Rs. 2.40)
= Rs. 4,000 – Rs. 4,320
= - Rs. 320 (U)

2) **Wage Rate Variance** = Actual hours (Standard rate – Actual rate)
= 1,800 hours (Rs. 2 – Rs. 2.40)
= 1,800 x – 0.40
= - Rs. 720 (U)

3) **Labour Efficiency Variance** = Std. rate (Std. hours – Actual hours)
= Rs. 2 (2,000 – 1,720)
= Rs. 2 x 280
= + Rs. 560 (F)

Note: Here, the idle hours must be deducted from actual hours.

Actual hours 1,800 – Idle time 80 hours = 1,720 hours.

4) **Idle Time Variance** = Abnormal Idle x Standard wage rate
= 80 hours x Rs. 2
= - Rs. 160 (U)

Verification:

Labour Cost Variance = Wage Variance + Efficiency Variance + Idle time Variance
= - 720 + 560 – 160
= - Rs. 320 (U)

5) **Labour Mix Variance** : When number of different types of workers required for a job is fixed, but in practice, a different mix of labour is used for the job, a labour cost variance arises which is described as labour mix variance. It is just like material mix variance. It is also known as Labour Gang Composition Variance. Its formula is as follows:

Labour Mix Variance = Standard Wage Rate (Standard Mix – Actual Mix)

Illustration 17 :

The standard mix of labour for a job is as under (This job finishes within 50 hours).

5 male workers paid at Rs. 2.50 per hour

6 female workers paid at Rs. 2.00 per hour

2 child workers paid at Rs. 1.50 per hour

But, actually, 7 male workers, 5 female workers and 1 child are employed for this job. Compute labour mix variance.

Solution:

Labour Mix Variance = Standard Rate (Standard Mix – Actual Mix)

Males = - Rs. 2.50 (5-7) = Rs. 2.50 x -2 = -Rs. 5

= - Rs. 5 x 50 hours = -Rs. 250 (U)

Females = Rs. 2 (6-5) = 2 x 1 = Rs. 2

= Rs. 2 x 50 hours = Rs. 100 (F)

Child = Rs. 1.50 (2-1) = Rs. 1.50

= Rs. 1.50 x 50 hours = Rs. 75 (F)

Total Mix Variance = -250 + 100 + 75 = - 75 (F)

Note: In this problem total number of Standard workers are 13 and actual number of workers are also 13 and so standard mix has not been revised. If both are different, then instead of Std. mix. Revised Std. Mix will have to be written in the formula as we are doing in material mix variance.

Illustration 18 :

Following labour mix had been provided in the budget to produce 1000 units of a product :

			Total Standard Hours	**Total Standard Cost (Rs.)**
30 males	0.40 per hour	50 hours	1,500	600

20 Females	0.30 per hour	30 hours	600	180
10 Children	0.20 per hour	20 hours	200	40
			2,300	820

The information abour actual hours of work and labour mix is as follows:

			Total Actual Hours	**Total Actual Cost (Rs.)**
25 males	0.45 per hour	50 hours	1,250	562-50
30 Females	0.30 per hour	30 hours	900	270-00
10 Children	0.20 per hour	15 hours	150	30-00
			2,300	862-50

Calculate: 1) Labour cost variance 2) Wage rate variance 3) Labour efficiency variance and 4) Labour mix variance.

Solution:

1) Labour Cost Variance = (Std. hrs x Std. Rate) – (Actual hrs. x Actual Rate)

Male = (1500 hours x 0.40) – (1250 x 0.45)

= Rs. 600 – Rs. 562.50 = + Rs. 37.50 (F)

Females = (600 x 0.30) – (900 x 0.30)

= Rs. 180 – Rs. 270 = - Rs. 90 (U)

Children = (200 x 0.20) – (150 x 0.20)

= Rs. 40 – Rs. 30 = + Rs. 10 (F)

Total Labour Cost Variance = -Rs. 42.50 (U)

OR

= Std. Wage Cost - Actual Wage Cost

= 820 – 862.50

= -42.50 (U)

2) Wage Rate Variance = Actual Hours (Standard Rate – Actual Rate)

Male	= 1250 (0.40 – 045)		
	= 1250 (0.05)	=	-Rs. 62.50 (U)
Females	= 900 (0.30 – 0.30)	=	0
Children	= 150 (0.20 – 0.20)	=	0
Total Wage Rate Variance		=	- Rs. 62.50 (U)

3) Labour Mix Variance = Standard Rate (Standard Mix - Actual Mix)

Male	= 40 paise (1500 - 1250)		
	= 40 paise x 250	=	+ Rs. 100 (F)
Females	= 30 Paise (600 - 900)		
	= 30 paise x – 300	=	- Rs. 90 (U)
Children	= 20 paise (200 – 150)		
	= 20 paise x 50	=	+ Rs. 10 (F)
	Total labour mix variance	=	+ Rs. 20 (F)

Note: Since standard hours and actual hours are equal (2300) in this case, there is no need to revise standard mix. Hence there is no efficiency variance in this case. Labour efficiency variance does not arise when labour mix variance is accompanied by the equality between standard hours and actual hours. But if standard hours and actual hours are unequal, labour efficiency variance does arise and is similar to material sub- usage variance. It is known as Revised Labour Efficiency Variance.

Illustration 19 :

Data about standard cost of a unit of output in a factory is as follows:

Material : 4 kg. Rs. 50 per kg.	Rs. 200
Labour : 50 hours Re. per hour	Rs. 50
	Rs. 250

Data about actual cost:

Actual production : 100 units

Material : 390 kg. Rs. 52 per kg. Rs. 20,280

Labour : 4,920 hours Rs. 1.10 per hour Rs. 5,412

Rs. 25,692

Solution:

Standard material cost of actual production of 100 units

100 units x 4 kg. = 400 kg. x Rs. 50 = Rs. 20,000

Let us now compute material variance.

1) Material Cost Variance = (Std. Qty. x Std. Price)
- (Actual Qty. – Actual price)
= Rs. 20,000 – Rs. 20,280
= - Rs. 280 (U)

2) Material Price Variance = Actual Quantity (Std. Price – Actual Price)
= 390 kg. (Rs. 50 – Rs. 52)
= 390 x -2
= - Rs. 780 (U)

3) Material Usage Variance = Std. Price (Std. Qty – Actual Qty.)
= Rs. 50 (400 kg. – 390 kg.)
= Rs. 50 x 10
= Rs. 500 (F)

Now, Material Cost Variance = Material Price Variance + Material Usage Variance
= - 780 + 500
= - Rs. 280 (U)

Labour Variance:

1) Labour Cost Variance = (Std. Hours x Std. Rate) – (Actual Hours x Actual Rate)
= (100 units x 50 hours x Re. 1) – (Rs. 5,412)

= Rs. 5000 – Rs. 5,412

= - Rs. 412 (U)

2) Wage Rate Variance = Actual Hours (Std. Rate – Actual Rate)

= AH (SR - AR)

= 4,920 hours (Re. 1 – Re. 1.10)

= 4,920 x 0.10

= - Rs. 492 (U)

3) Labour Efficiency Variance = Std. Rate (Std. Hours – Actual Hours)

= SR (SH - AH)

= Re. 1 (5,000 hours 4,920 hours)

= Re. 1 x 80 hours

= + Rs. 80 (F)

Labour Cost Variance = Wage Rate Variance + Efficiency Variance

= - 492 + 80

= - Rs. 412 (U)

Illustration 20 :

Following is the data about standard and actual issues of Chemical No. 15 as obtained from the accounts of A chemical Company Limited.

Calculate relevant variances.

Kgs.	Standard	Rs.	Kgs.	Actual	Rs.
450	Material X Rs. 20 per kg.	900	450	Material X Rs.19 per kg.	8,550
360	Material Y Rs. 10 per Kg.	3,600	360	Material Y Rs. 11 per kg.	3,960
810		**12,600**	**810**		**12,510**
2,400	hours for skilled	4,800	2,400	hours for skilled	5,400

	workers at the rate of Rs. 2 per hour			workers at the rate of Rs. 2.25 per hour	
1,200	hours for unskilled workers, at the rate of Re. 1 per hour	1,200	1,200	hours for unskilled workers at the rate of Rs. 1.25 per hours	1,500
		6,000			**6,900**
90	Normal loss		50	Loss	
720	Production		760	Production	
	Total Rs.	**18,600**		**Total Rs.**	**19,410**

Solution:

A) Material Variances:

Standard Cost per unit: Per unit standard cost is required to calculate material yield variance. It can be calculated as under:

X = 450 kg. x Rs. 20 = Rs. 9,000

Y = 360 kg. x Rs. 10 = Rs. 3,600

Rs. 12,600

The standard quantity is 720 kg. the standard cost of which is Rs. 12,600

Hence per unit standard Cost $= \frac{12,600}{720}$

= Rs. 17.50

1) Material Cost Variance = (Actual Production x per unit standard Cost) – (Actual production x Actual Cost)

= (760 kg. x Rs. 17.50) – Rs. 12,510

= Rs. 13,300 – Rs. 12,510

= + Rs. 790 (F)

2) Material price Variance= Actual Qty. (Std. Price – Actual price)

X = 450 kg.(Rs. 20 – Rs. 19) = + Rs. 450 (F)

Y	= 360 kg. (Rs. 10 – Rs. 11)	=	- Rs. 360 (U)
	Total	=	Rs. 90 (F)

3) Material Yield Variance = Standard Cost (Actual yield – Standard yield)

= Rs. 17.50 (760 - 720)

= Rs. 17.50 x 40

= Rs. 700 (F)

Labour Variances:

It is necessary to calculate per unit standard labour cost to obtain labour yield variance. It can be calculated as follows:

$$\frac{\text{Total Standard labour cost}}{\text{Standard production}} = \frac{\text{Rs.6,000}}{\text{720 kg.}} = \text{Rs. } 8\frac{1}{3}$$

1) Labour Cost Variance = (Actual production x per unit standard cost)

– (Actual hours x Actual wage rate)

= $(760 \times 8\frac{1}{3}) - (6{,}900)$

= 6,333.33 – 6,900

= - Rs. 566.67 (U)

2) Wage Rate Variance = Actual Hours (Standard Rate – Actual Rate)

Skilled	= 2,400 (2 – 2.25)	=	- Rs. 600 (U)
Unskilled	= 1,200 (1 – 1.25)	=	- Rs. 300 (U)
	Total	=	- Rs. 900 (U)

3) Labour Yield Variance = Per unit Standard labour cost

(Actual production – Standard Production)

= Rs. 25/3 (760 - 720)

= Rs. 25/3 x 40

= Rs. 333.33 (F)

Labour Cost Variance = Wage Rate Variance + Labour Yield Variance

= 900 + 333.33

= - Rs. 566.67 (U)

Illustration 21:

Find out variance from the following data:

Standard cost per unit:

Material : 5 kg	Rs. 50
Wage Cost : 20 hours	Rs. 10
	Rs. 60

For actual production of 500 units, 2.7 metric tons of materials costing Rs. 25,650 was used and wages of Rs. 6,050 for 11,000 hours were paid, which include 20 hours of idle time due to machine breakdown.

Solution:

Standard : For 500 units, Usage = 500 x 5 kgs. = 2,500 kgs.

Price = 500 units x Rs. 50 = Rs. 25,000

Actual : Usage = 2.7 m. tons x 1,000 kgs. = 2,700 kgs.

Price = Rs. 25,650

Actual Price per kg. = Rs. 25,650 ÷ 2,700 = Rs. 9.50

Remember : 1 metric ton = 1,000 kilograms

1) **Material Cost Variance** = Standard Cost – Actual Cost

= Rs. 25,000 – 25,650

= - 650 (U)

2) **Material Price Variance** = Actual Qty. (Std. Price – Actual Price)

= 2,700 (Rs. 10 – Rs. 9.50)

= 2,700 x 0.50

= + 1,350 (U)

3) **Material Usage Variance** = Std. Price (Std. Usage – Actual Usage)

= 10 (25,000 – 25,650)

= -650 (U)

B) Labor Variance :

Std. Labour Cost = 500 units x Rs. 10 = Rs. 5,000

Actual Labour Cost = Rs. 6,050

Standard hours = 500 units x 20 hrs per unit = 10,000

Standard wage rate = 10 ÷ 20 hrs. = 0.50 per hour

Actual wage rate = Rs. 6,050 ÷ 11,000 = 0.55 per hour.

1) **Labour Rate Variance** = Std. Labour Cost – Actual Cost

= Rs, 5,000 – Rs. 6,050

= - 1,050 (U)

2) Wage Rate Variance = Actual Hours (Std. Rate – Actual Rate)

= 11,000 (0.50 – 0.55)

= -550 (U)

3) Labour Efficiency Variance = Std. Rate (Std. Hours – Actual Hours)

= 0.50 (10,000 – 10,980)

= 0.50 x – 980

= -490 (U)

Remember that while calculating Efficiency Variance, idle time is deducted from actual Hours.

4) Idle Time Variance = 20 hours x Std. Rate 0.50

= - Rs. 10 (U)

3.2.8 Overhead Cost Variance (OCV)

Overhead Cost Variance is the difference between the standard cost of overhead allowed for actual output achieved and the actual overhead cost incurred. It arises due to under or over recovery of overhead. The formula for the calculation of overhead cost variance is as under:

Overhead Cost Variance = [(Standard Overhead Rate per unit x Actual Output) – Actual Overhead cost]

Overhead cost variance can be classified as under:

1) Variable Overhead Variance (VOV)

2) Fixed Overhead Variance (FOV)

1) Variable Overhead Variance (VOV) : It is the difference between the standard variable overhead cost allowed for actual output and the actual overhead cost incurred during the period. The formula for the calculation of overhead cost variance is as under:

Variable overhead Variance = [(Std. Variable Overhead Rate x Actual Output) – Actual Variable Overhead]

Or

Variable Overhead Variance (VOV) = [(Std. Variable Overhead Rate per Hour x Standard Hours for Actual Output) – Actual Variable Overhead]

In case the standard time allowed and actual time taken is given, Variable overhead Variable can be classified into i) Variable Overhead Expenditure Variance ii) Variable Overhead Efficiency Variance as under:

i) Variable Overhead Expenditure Variance =

[(Standard Variable Overhead Rate per Hour x Actual Hours Worked) – Actual Variable Overheads]

Or

Actual Hours (Std. Variable Overhead Rate per Hour – Actual Variable Overhead Rate per Hour)

ii) Variable Overhead Efficiency Variance =

(Std. time for actual production x Std. Variable Overhead Rate per Hour) – (Actual hours worked x Std. Variable Rate per Hour.)

Or

Std. Variable Overhead Rate per Hour (Std. Hours for Actual Production – Actual Hours)

Illustration 22 : (Variable Overhead Variances)

From the following data, calculate variable overhead variances:

	Budgeted	**Actual**
Variable overhead (Rs.)	2,50,000	2,60,000
Output in units	25,000	20,000
Working Hours	1,25,000	1,10,000

Solution:

Standard Variable Overhead per unit= Budgeted Variable Overhead / Budgeted output in units

= 2,50,000/ 25,000 = **Rs. 10 per unit**

Std. Variable Overhead per hour = Budgeted Variable Overhead / Budgeted output in hours

= 2,50,000 / 1,25,000 = **Rs. 2 per hour**

Time Allowed per unit of output = Budgeted Working Hours / Budgeted output in units

= 1,25,000 / 25,000 = **5 hours per unit**

Overhead Cost Variance

= [(Standard Overhead Rate per unit x Actual Output) - Actual Overhead cost]

= [(10 x 20,000) – 2,60,000] = (2,00,000 – 2,60,000) = **(-) Rs. 60,000 Adverse**

Variable Overhead Expenditure Variance

= [(Std. Variable Overhead Rate per Hour x Actual Hours Worked) – Actual Variable Overheads]

= [(2 x 1,10,000) – 2,60,000] = **(-) Rs. 40,000 Adverse**

Variable Overhead Efficiency Variance

= Std. Variable Overhead Rate per Hour (Std. Hours for Actual Production – Actual Hours)

= 2[(20,000 x 2) – 1,10,000] = **(-) 20,000 Adverse**

2) Fixed Overhead Variance (FOV): It is a part of total overhead cost variance. It occurs due to difference between the standard cost of fixed overhead allowed for the actual production undertaken and the actual fixed overhead cost incurred. The formula for the calculation of overhead cost variance goes as under:

FOV = (Std. Fixed Overhead Rate per unit x Actual Production) – Actual Fixed Overheads

Or

FOV = (Std. Fixed Overhead Rate per Hour x Actual Hours of Production) - Actual fixed Overhead

Fixed Overhead Variance can be further analyzed as under:

3) Expenditure Variance: It is a portion of Fixed Overhead Variance that occurs when actual fixed overhead expenditure incurred is not as per the budgeted fixed overhead expenditure. Budgeted fixed Overhead Expenditure (consisting of standing charges like Rent, Lighting, Depreciation, Insurance, Administrative Expenses etc.) is expected to remain unchanged irrespective of small changes in the production level. But in reality they may change marginally causing expenditure variance. The formula for the calculation of overhead cost variance goes as under:

Expenditure Variance = Budgeted fixed Overhead – Actual Fixed Overhead

Or

Expenditure Variance = (Std. Fixed Overhead Rate per Hour x Budgeted Hours) – Actual Fixed Overhead

4) Volume Variance = Total Fixed Overhead are expected to remain constant over a period of time irrespective of changes in the production. Hence with the same amount of fixed overhead if we increase the volume of production the firm is going to gain and if we decrease the volume of production the firm is going to lose. Such gain or lose if fixed overhead arising form increase or decrease in the volume of production is indicated by volume variance. This variance indicates the over or under absorption of fixed overheads arising from the changes in the volume of production during a particular period. This variance can be ascertained as under:

Volume Variance = Std. Rate of Fixed Overhead p.u. (Actual Output – Budgeted Output)

Or

Volume Variance = Std Rate per Hour (Std. Hours for Actual Output – Actual Hours)

Or

Volume Variance = (Actual Output x Std. Rate) – Budgeted Fixed Overhead

Volume variance can be further subdivided into three variance as: i) Capacity Variance ii) Calendar Variance, and iii) Efficiency Variance

i) Capacity Variance = It represent that portion of volume variance that arises due to working at higher or lower capacity than the budgeted capacity. In other words, this variance occurs when a factory works for more or less hours than the budgeted working hours. Thus this variance is related to the under or over utilization plant capacity can arise due to several reasons like idle time, strikes, lockouts, breakdown of the machinery, power failure, shortage of material, labour, absenteeism, overtime working changes in the number of shifts etc. This variance can be ascertained as under:

Capacity Variance = Standard Rate of Fixed Overhead p. u. (Revised budgeted units due to changed capacity – Budgeted Output in Units)

Or

Capacity Variance = Std. Rate of Fixed Overhead per Hour (Revised Budgeted hours due to changed capacity – budgeted Hours)

ii) Calendar Variance = It represents the portion of volume variance that arises due to difference between the actual working days and budgeted working days during the period. In other words, this variance occurs when a factory works for more or less days than the budgeted working days during the period. If actual working days are more than the budgeted working days this variance will be favorable. On the other hand if the actual working days are less than the budgeted it will be favorable. On the other hand if the actual working days are less than the budgeted it will be unfavorable. The formula to compute this variance is as under:

Calendar Variance = Standard Rate of Fixed Overhead p.u. (Revised budgeted units due to changed working days – Budgeted Output in Units)

Or

Calendar Variance = Std. Rate of Fixed Overhead per Hour (Revised Budgeted hours due to changed working days – Budgeted Hours)

Or

Calendar Variance= Increased or decreased production due to more or less working days at the rate of budgeted capacity x Std. rate per unit.

iii) Efficiency Variance = It is the portion of volume variance that arises due to the difference between the budgeted efficiency of workers and actual efficiency achieved. It indicated the gain or loss arising from the efficiency or inefficiency of workers respectively. The formula for ascertainment of this variance is as under:

Efficiency Variance = Standard Rate per Unit (Actual Production units – Standard Production units)

Efficiency Variance = Standard Rate per Hour (Standard hours for actual output – Actual hours worked)

Following chart indicates the relationship between variance overhead variances:

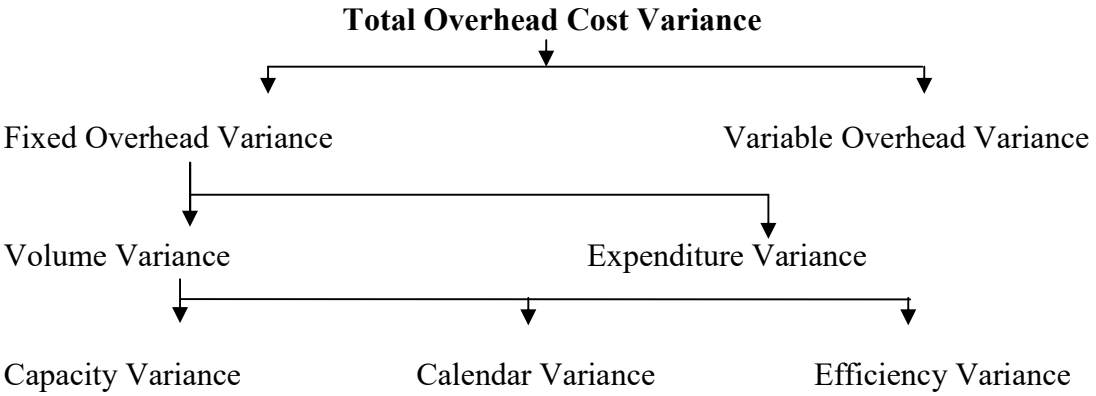


Illustration 23:

Rajesh Ltd. has furnished you the following data:

	Budgeted	**Actual**
Output	15,000 units	16,000 units
No of working days	25	27
Fixed Overhead	Rs. 30,000	Rs. 30,500
Variable Overhead	Rs. 45,000	Rs. 47,000

There was an increase of 5% in capacity

Calculate all the overhead variacne.

Solution:

Standard Fixed Overhead Rate p. u. = Budgeted Fixed Overhead / Budgeted Output

= 30,000 / 15,000 = **Rs. 2 p.u.**

Standard Variable Overhead Rate p.u = Budgeted Variable Overhead / Budgeted Output

= 45,000 / 15,000 = **Rs. 3 p.u.**

Standard Total Overhead Rate p.u = Budgeted Total Overhead / Budgeted Output

= 75,000 / 15,000 = **Rs. 5 p.u.**

1) Total Overhead Cost Variance:

= Std. total overhead rate x Actual units- Actual total Overhead cost

= Rs. 5 x 16,000 – 77,500 = **Rs. 2,500 Favorable**

2) Variable Overhead Cost Variance:

= (Std. Variable Overhead Rate per Hours x Standard Hours for Actual Output) – Actual Variable Overhead

= (3 x 16,000) – 47,000 = **Rs. 1,000 Favorable**

3) Fixed Overhead Cost Variance:

= (Std. Fixed Overhead Rate per unit x Actual Production) – Actual Fixed Overhead

= (2 x 16,000)- 30,500 = **Rs. 1,500 Favorable**

4) Expenditure Variance:

= Budgeted Fixed Overhead – Actual Fixed Overhead

= 30,000 – 30500 = **(-) Rs. 500 Adverse**

5) Volume Variance:

= Std. Rate of Fixed Overhead p. u. (Actual Output - Budgeted Output)

= 2 (16,000 – 15,000) = **Rs. 2,000 Favorable**

6) Calendar Variance:

= Std. Rate of Fixed Overhead per Hour (Revised Budgeted Output due to changed working days – Budgeted Output)

= Rs. 2 (15,000 x $\frac{27}{25}$ - 15,000) = 2 (16,000 – 15,000) = **Rs. 2,400 Favorable**

7) Capacity Variance:

= Standard Rate of Fixed Overhead p. u. (Revised Budgeted Output with changed working days & capacity – Revised Budgeted Output with changed working days)

= Rs. 2 (16,200 $\frac{105}{100}$ - 16,200) = 2(17,010- 16,200) = **Rs. 1,620 Favorable**

8) Efficiency Variance:

= Standard Rate of Fixed Overhead p. u. (Actual output - Revised Budgeted Output with changed working days & capacity)

= 2(16,000- 17,010) = **Rs. 2,020 unfavorable.**

Verification:

1) **Total Overhead Variance** = Variable Overhead Variance + Fixed Overhead Variance

   2500 = 1000 + 1500

2) **Fixed Overhead Variance** = Expenditure Variance + Volume Variance

   1500 = -500 + 2000

3) **Volume Variance** = Capacity V. + Calendar V + Efficiency V.

   2,000 = 1620 + 2400 + 2020

Illustration 24 : (Fixed Overhead Variance)

Rajkamal Ltd. has furnished you the following data:

	Budgeted	Actual
No of working days	25	27
Production in units	20,000	22,000
Fixed Overheads	Rs. 30,000	Rs. 31,000

Budgeted Fixed Overhead Rate is Re. 1 per hour. In July, 2015 the actual hours worked were 31,500

Calculate: 1) Total Overhead Variance 2) Expenditure Variance 3) Volume Varinace 4) Capacity Variance 5) Calendar Variance 6) Efficiency Variance

Solution:

Budgeted Fixed Overhead Rate per hour = Re. 1 per hour (Given)

Budgeted Fixed Overhead = Rs. 30,000 (Given)

Therefore, **Budgeted Hours** = (30,000 / 1) = 30,000 Hours

Budgeted Production in units = 20,000 (Given)

Therefore, **Standard time per unit** =Budgeted Hours/ Budgeted Production in units
= (30,000 / 20,000)

= 1.50 hours

Standard Rate per Unit = (Budgeted Overhead / Budgeted Output) =

(Rs. 30,000 / 20,000 units) = Rs. 1.50

Fixed Overhead Variance = [(Std. Fixed Overhead Rate per unit x Actual Production) – Actual Fixed Overhead]

= [(1.5 x 22,000) – 31,000] = (33,000 – 31,000) = Rs. 2,000 Favorable

Expenditure Variance = Budgeted Fixed Overhead – Actual Fixed Overhead

= 30,000 – 31,000= (-) Rs. 1,000 Adverse

Volume Variance = Std. Rate of Fixed Overhead p. u. (Actual Output – Budgeted Output)

= 1.50 (22,000 – 20,000) = Rs. 3,000 Favorable

Calendar Variance:

Budgeted Fixed Overhead Rate is Re. 1 per hour and Budgeted Fixed Overhead are Rs. 30,000 Therefore, Budgeted Working Hours are 30,000 for 25 days that is 30,000 / 25 = 1200 hours per day.

Actual number of days worked is 27 days, Therefore revised budgeted hours for 27 days are 27 days at 1200 hours = 32,400 hours.

Calendar Variance = Std. Rate of Fixed Overhead per Hour (Revised Budgeted hours due to changed working days - Budgeted Working Hours)

= Re. 1 (32,400 – 30,000) = Rs. 2400 Favorable

Capacity Variance = Revised Budgeted hours due to changed working days are 32,400, however, actual hours worked as given in the problem are 31,500

Capacity Variance:

= Std. Rate of Fixed Overhead per Hour (Revised Budgeted hours due to changed capacity – Budgeted Hours)

= Re. 1 (31,500 – 32,400) = (-) Rs. 900 Adverse

Efficiency Variance:

= Standard Rate per Hour (Standard hours for actual output – Actual hours worked)

= Re. 1 [(1.5 x 22,000) – 31,500) = Re. 1(33,000 – 31,500) = Rs. 1,500] Favorable

Verification:

3) Fixed Overhead Variance = Expenditure Variance + Volume Variance

   2000 = - 1000 + 3000

4) Volume Variance = Capacity V. + Calendar V + Efficiency V.

   3000 = - 900 + 2400 + 1500

3.2.9 Sales Variance: Sales Variance has two types:

Sales Variances/Sales Revenue Variance/Sales Value Variance

Sales Margin or Profit Variances :

3.2.9.1 Sales Variances/Sales Revenue Variance/Sales Value Variance

Sales variance is the aggregate variance or net variance like material cost variance or labour cost variance. These variances are computed with reference to budget. Sales variances are income. It arises due to difference between the actual sales value and the budgeted sales value. This variance can be caused by:

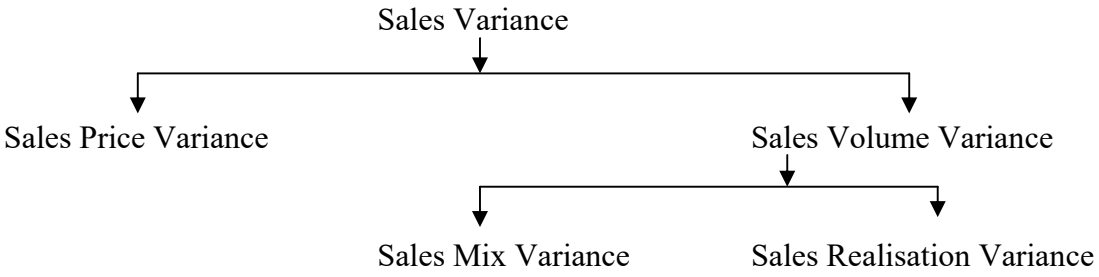
a) Actual sales price being different from the budget sales price for any reason. Therefore, it is called as Sales Price Variance.

b) Actual volume of sales being different from the budgeted volume of sales. Therefore, it is called as Sales Volume Variance.

c) Actual sales mix being different from the standard sales mix as originally envisaged in the budget. But this variance will arise only in case of multi product units. Therefore, it is called as Sales Mix Variance.

d) Actual sales allowance being different from the budgeted or standard allowance.

Sales Variance and its sub-divisions are summarized in a flow-chart given below:



One can find out the variances with the help of following formulas:

a) Sales Revenue/Sales Value Variance = Actual Sales Value – Budgeted Sales Value

b) Sales Price Variance: Sales price variance is that portion of sales revenue variance, which is due to difference between actual selling price and budgeted/standard selling price.

Sales Price Variance = Actual Quantity × Difference in Price.

Or

Sales Price Variance = Actual Quantity Sold × (Actual Selling Price – Standard Selling Price)

c) **Sales Volume Variance**: Sales Volume Variance is that portion of sales value/revenue, which is due to difference between actual volume of sales and budgeted sales. This difference may be caused by-

i) Unforeseen competition.

ii) Ineffective sales promotion.

iii) Lack of proper sales planning etc.

Sales Volume Variance = Budgeted Selling Price × Difference in Quantity

Or

Sales Volume Variance = Budgeted Selling Price × (Actual Sales Quantity – Budgeted Sales Quantity)

This variance can be further classified into:

i) Sales Mix Variance and

ii) Sales Realisation Variance or Sales Quantity Variance.

i) **Sales Mix Variance:** Sales Mix Variance is that portion of sales volume variance, which is due to change in the composition of budgeted sales mix. However, this will arise only in case of multi product selling units.

Sales Mix Variance = Budgeted Price × Difference in Actual Quantity and Budgeted proportion of Actual Quantity.

ii) **Sales Realisation Variance =** Average Budgetary Selling Price × Difference in Quantity Sold.

Where,

a) **Average Budgeted Selling Price =** $\frac{\text{Budgeted Realisation}}{\text{Budgeted Units}}$

b) **Difference in Quantity Sold** =

	Actual Quantity Sold
Less	Budgeted Quantity Sold
=	Difference

If Actual Quantity Sold is more than the Budgeted Quantity Sold, the difference is Favorable and vice-versa.

Illustration 25.

M ltd. operates a budgetary control and standard costing system. Calculate Sales Variance.

Product	Budgeted		Actual	
	Units to be sold	Sales Value (₹)	Units Sold	Sales Value (₹)
A	200	2400	200	2200
B	100	1200	100	1200
C	200	1800	400	3400
D	150	900	100	600

Solution:

Product	Budgeted			Actual			Budgeted proportion of AQ
	Qty	Price	₹	Qty	Price	₹	Qty
A	200	12	2400	200	11.00	2200	246.2
B	100	12	1200	100	12.00	1200	123.0
C	200	09	1800	400	8.50	3400	246.2
D	150	06	900	100	6.00	600	184.6
Total	**650**		**6300**	**800**		**7400**	**800.0**

Calculation of Budgeted proportion of Actual Quantity:

e.g. Product A

$\frac{650}{800}$ 200 $\frac{800}{650} \times 200$

?

= 246.2

Note: Students should have to calculate the Budgeted proportion of Actual Quantity of other products i.e. B, C & D

I) Sales Price Variance = Actual Quantity × Difference in Price

A = 200 × 1 (A) = 200 (A)

B = 100 × NIL = NIL

C	=	400	×	0.5(A)	=	200	(A)
D	=	100	×	NIL	=	NIL	
			TOTAL			**400**	**(A)**

II) Sales Volume Variance = Budgeted Price × Difference in Quantity

A	=	12	×	NIL	=	NIL	
B	=	12	×	NIL	=	NIL	
C	=	09	×	200(F)	=	1800	(F)
D	=	06	×	50 (A)	=	300	(A)
			TOTAL			**1500**	**(F)**

III) Sales Revenue Variance = Actual Sales Value – Budgeted Sales Value

A	=	2200	-	2400	=	200	(A)
B	=	1200	-	1200	=	Nil	
C	=	3400	-	1800	=	1600	(F)
D	=	600	-	900	=	300	(A)
		6300	**-**	**7400**		**1100**	**(F)**

IV) Sales Mix Variance = Budgeted Price × (Difference in Budgeted proportion in Actual Quantity and Actual Quantity)

A	=	12	×	46.2	(A)	=	554.4	(A)
B	=	12	×	23	(A)	=	276	(A)
C	=	09	×	153.8	(F)	=	1384.2	(F)
D	=	06	×	84.6	(A)	=	507.6	(A)
							46.2	**(F)**

V) Sales Realisation Variance = Average Budgeted Selling Price × Difference in Quantity Sold.

a) Average Budgeted Selling Price = $\frac{\textbf{Budgeted Realisation}}{\textbf{Budgeted Units}}$

$= \frac{6300}{650}$

Average Budgeted Selling Price= 9.692

b) Difference in Quantity Sold =

Actual Quantity Sold = 800

Less: Budgeted Quantity $= \frac{650}{150\ (F)}$

∴ Sales Realisation Variance = 9.692 × 150 (F) = 1453.8

Reconciliation Statement:

	SPV	+	**SVV**	=	**S Rev. V**	**SMV**	**SRV**
A	200 (A)	+	Nil	=	200 (A)	554.4 (A)	
B	Nil	+	Nil	=	Nil	276 (A)	
C	200 (A)	+	1800 (F)	=	1600 (F)	1384.2 (A)	
D	Nil	+	300(A)	=	300 (A)	507.6 (A)	
TOTAL	**400 (A)**	+	**1500(F)**	=	**1300 (F)**	**46.2 (F)**	**1453.8 (F)**

3.2.9.2 Sales Margin or Profit Variances

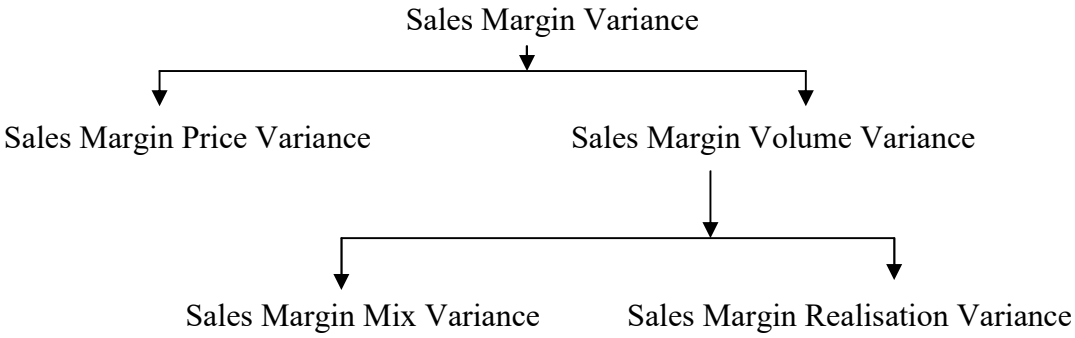
Total Sales Margin or Profit Variance:

This variance is also known as the overall profit variance and arises due to difference between actual profit margin and budgeted profit margin, this variance further analysed under two heads-

a) Sales Margin Price Variance and

b) Sales Margin Volume Variance.

Sales Margin Variance and its sub-divisions are summarized in a flow-chart given below:



One can find out the variances with the help of following formulas:

Total Sales Margin Variance = Actual Profit – Budgeted Profit

a) Sales Margin Price Variance:

Sales price margin variance is that portion of sales margin variance, which is due to difference between actual selling price and the standard selling price of actual sales.

Sales Margin Price Variance = Actual Quantity sold × (Actual Selling Price – Standard Selling Price)

Or

Sales Margin Price Variance = Actual Quantity × Difference in Margin

b) Sales Margin Volume Variance:

Sales Margin Volume Variance is that portion of toral sales margin variance, which is due to difference between standard/budgeted profit and actual profit margin. Quantity and mix are the two components of the sales margin volume variance and the variations in profits can be explained to some extent by analysing sales quantity and sales mix.

Sales Margin Volume Variance= Standard profit per unit × (Actual sales quantity – Standard sales quantity)

- Sales Margin Volume Variance is sub-divided into :
  a) Sales Margin Mix Variance.
  b) Sales Margin Realisation Variance.

a) **Sales Margin Mix Variance:**

Sales Margin Mix Variance is that portion of sales margin volume variance, which is due to change in actual sales mix and budgeted sales mix.

Sales Margin Mix Variance = Budgeted Margin × Difference in Actual Quantity and Budgeted Proportion of Actual Quantity.

b) **Sales Margin Realisation Variance:**

This variance is that portion of sales margin effect on profits of any increase or decrease in the total number of units sold, if sales were made in the standard product mix.

Sales Margin Realisation Variance = Average Budgeted Profit × Difference in Quantity Sold.

Illustration 26

S Ltd. has drawn up the following sales budget for June, 2024.

Particulars	Budgeted		Actual	
	Units	Price/unit	Units	Price/unit
B	5000	200	5750	240
C	4000	400	4850	360
S	6000	360	5000	330

The cost per unit of B,C & S were ₹ 180, ₹ 340 and ₹ 260 respectively. Analyse the variance to show:

i) Sales margin price variance.

ii) Sales margin volume variance.

iii) Sales margin mix variance.

iv) Sales margin realisation variance

v) Sales margin value variance.

Solution:

Particulars	Budgeted			Actual			Budgeted proportion of Actual Quantity
	Qty.	Margin/ unit	Total	Qty.	Margin/ unit	Total	Qty
B	5000	20	100000	5750	60	345000	5200

C	4000	60	240000	4850	20	97000	4160
S	6000	100	600000	5000	70	350000	6240
Total	15000		940000	15600		792000	15600

i. SMPV = Actual Quantity × Difference in Margin

B	=	5750	×	40	F	=	2,30,000	F
C	=	4850	×	40	A	=	1,94,000	A
S	=	5000	×	30	A	=	1,50,000	A
							1,14,000	A

ii. SM Volume Variance = Budgeted Margin × Difference in Quantity

B	=	20	×	750	F	=	1500	F
C	=	60	×	850	F	=	51,000	F
S	=	100	×	1000	A	=	1,00,000	A
							47,500	A

iii. SM Value Variance = Budgeted Total Margin - Actual Total Margin

B	=	1,00,000	-	3,45,000		=	2,45,000	F
C	=	2,40,000	-	97,000		=	1,43,000	A
S	=	6,00,000	-	3,50,000		=	2,50,000	A
							1,48,000	A

iv. SM Mix Variance = Budgeted Margin × Difference in Budgeted proportion of Actual Quantity and Actual Quantity.

B	=	20	-	550	F	=	11,000	F
C	=	60	-	690	F	=	41,400	A
S	=	100	-	1240	A	=	1,24,000	A
							71,600	A

v. Sales Margin Realisation Variance = Average Budgeted Profit × Difference in Quantity Sold.

$$\textbf{Average Budgeted Profit} = \frac{\textbf{Budgeted total margin}}{\textbf{Budgeted Quantity}}$$

$$= \frac{9{,}40{,}000}{15{,}000}$$

∴ Average Budgeted Profit = 62.67

Difference in Quantity Sold = Actual Quantity Slod – Budgeted Quantity Sold

= 15600 – 15000 = 600 F

∴ **Sales Margin Realisation Variance =** 62.67 × 600 F = 37,600 F

Check Your Progress-I

I) Choose the correct answer from the following multiple choice question:

1) An unfavorable material price variance occurs because of :
   a) Price increase in materials
   b) Price decrease in materials
   c) Less than normal wastage of materials
   d) More than normal wastage of materials
2) An unfavorable material usage variance arises because of:
   a) Price increase in materials
   b) Price decrease in materials
   c) Less than normal wastage of materials
   d) More than normal wastage of materials
3) Volume variance arise because of :
   a) Increase in overhead rate per hour
   b) Decrease in overhead rate per hour
   c) Change in actual output
   d) Difference in overhead rate per hour
4) Expenditure variance arises because of :
   a) Increase in overhead rate per hour

b) Decrease in overhead rate per hour

c) Change in actual output

d) Difference in budgeted and actual overhead

5) Adverse capacity variance arises because of:

a) More than normal wastage

b) Less than budgeted working hours

c) Increase in working days

d) Deterioration in working conditions

6) Favorable calendar variance arises because of

a) More than normal wastage

b) Less than budgeted working hours

c) Increase in working days

d) Deterioration in working conditions

II) Say TRUE or False:

1) A standard costing is a technique of cost control.

2) Labor absenteeism leads to adverse labor rate variance.

3) Idle time variance= Idle time x actual rate.

4) Volume variance is a portion of capacity variance.

5) Adverse efficiency variance leads to adverse volume variance.

6) Material usage variance = Actual rate (Standard time – actual time)

7) Abnormal material wastage leads to unfavorable material yield variance.

8) Material yield variance is a portion of material usage variance.

9) Standard costing is a method of ascertainment of cost.

10) Standard costing may be used for cost control by trading organizatons.

III) Fill in the blanks:

1) Standard cost is ..... cost.

2) Material usage variance = Material Yield Variance + ...

3) Idle Time Variance = Idle time x .....

4) Fixed Overhead Variance is divided into Volume Variance and .....

5) Volume Variance ..... (Actual Output – Budgeted Output)

3.3 Summary

Standard Costing is a method of ascertaining the cost whereby statistics are prepared to show the standard cost, the actual cost and the difference between these costs, which is termed as variance. The basic characteristics of standard costing are predetermined cost, cost under efficient management, tool of cost control, a basis of price determination etc.

A variance is the difference between a standard cost and the comparable actual cost incurred during a period. The variances may be favorable or unfavorable depending an circumstances. There are different types of variances like Materials Variances, Labour Variances, Fixed Overhead Variances, Variable Overhead Variances etc.

3.4 Terms to Remember

1. **Sales variance:** Sales variance is the aggregate variance or net variance like material cost variance or labour cost variance. These variances are computed with reference to budget. Sales variances are income. It arises due to difference between the actual sales value and the budgeted sales value.
2. **Sales Margin or Profit Variance**: This variance is also known as the overall profit variance and arises due to difference between actual profit margin and budgeted profit margin.

3.5 Answers to Check Your Progress

I) 1 – a , 2-d, 3-c, 4-d, 5-b, 6-c.

II) True - 1, 5,,7, 8 False – 2, 3, 4, 6, 9, 10.

III) 1- Predetermined, 2- Material Mix Variance, 3- Standard Rate, 4- Expenditure Variance, 5- Standard Rate.

3.6 Exercise

A) Broad Answer Type Questions:

1) What is standard costing ? Explain the features of standard costing.
2) Define standard costing and explain the merits and limitations of standard costing.
3) Explain any six variances, two each under material, labor and overhead.
4) What are variances? How do they arise ? What are the benefits of analyzing variances?

B) Write Short Notes:

1) Standard cost and standard costing
2) Merits of standard costing
3) Limitations of standard costing
4) Material Yield variance
5) Volume variance

C) Practical Problems :

Exercise:

Problem 1 : M ltd. operates a budgetary control and standard costing system. Calculate Sales Variance.

Product	Budgeted		Actual	
	Units to be sold	Sales Value (₹)	Units Sold	Sales Value (₹)
A	2000	24000	2000	22000
B	1000	12000	1000	12000
C	2000	18000	4000	34000
D	1500	9000	1000	6000

1. Budgeted and actual sales for the month of January, 2024 of two products A & B are as follows.

Product	Budgeted Units	Sales price / unit (₹)	Actual units	Price /unit (₹)
A	6000	5.00	5000	5.00
			1500	4.75
B	10000	2.00	7500	2.00
			1750	1.90

Budgeted costs for products A & B are ₹ 4.00 and 1.50 per unit respectively. Work out the following variances:

i. Sales Value Variance

ii. Sales Volume Variance

iii. Sales Price Variance

iv. Sales Mix Variance

v. Sales Quantity Variance.

Problem 2 : S Ltd. has drawn up the following sales budget for June, 2024.

Particulars	Budgeted		Actual	
	Units	Price/unit	Units	Price/unit
B	15000	1200	15750	1240
C	14000	1400	14850	1360
S	16000	1360	15000	1330

The cost per unit of B,C & S were ₹ 1180, ₹ 1340 and ₹ 1260 respectively. Analyse the variance to show:

i) Sales margin price variance.

ii) Sales margin volume variance.

iii) Sales margin mix variance.

iv) Sales margin realisation variance

v) Sales margin value variance.

Problem 3 :

Calculate : (1) Material Cost Variance (2) Material Price Variance (3) Material Usage Variance from following data.

Material	Standard		Actual	
	Quantity (kg.)	Price Rs.	Quantity (kg.)	Price Rs.
A	600	8	720	7.50
B	900	10	1,080	10.20
	1,500		1,800	

Problem 4 :

Standard costing is used in a factory in which the information regarding production of August 2024 is as follows:

Standard : for production of 80 kg. material required 100 kg.

Standard price of material is Rs. 2 per kg.

Actual : production 24,000 kg.

Material used 29,000 kg.

Cost of material used Rs. 52,200

Calculate : 1) Materials Cost 2) Material Price Variance 3) Material Usage Variance.

Problem 5 :

Calculate Material Yield Variance on the basis of following data:

Material	**Standard**	**Actual**
A	120 unit at Rs. 20	105 unit at Rs. 22
B	80 unit at Rs. 15	95 unit at Rs. 15
	200 kg.	200 kg.

Normal loss is 10 percent and actual production is 170 units.

Problem 6 :

Compute Material Yield Variance in a factory on the basis of the information given below:

Material	Standard	Actual
A	20 kg. at Rs. 50	30 kg. at Rs. 40
B	30 kg. at Rs. 80	50 kg. at Rs. 90
	50 kg.	80 kg.

Standard loss is 15 per cent of the input and actual output is 70 kg.

Problem 7 :

From the following data, calculate labour variance:

	Standard	Actual
Number of workers employed	200	180
Average monthly wages per worker	Rs. 600	Rs. 720
Number of working days during the month	25	24
Production during the month (units)	20,000	18,000

Problem 8:

Data about labour employed in a factory to produce one unit of product X are as follows:

	Hours	Wage Rate (Rs.)	Total Payment (Rs.)
Skilled Workers	10	3.00	30.00
Unskilled Workers	16	1.00	16.00
Semiskilled workers	8	1.50	12.00
			58.00

Actual situation:

Actual Production : 200 units

	Hours	Wage Rate (Rs.)	Total Payment (Rs.)
Skilled Workers	1,800	4.00	7,200
Unskilled workers	4,000	0.90	3,600
Semi- skilled workers	1,680	1.50	2,520
	7,480		13,320

Calculate following variance:

1) Labour cost variance.
2) Wage rate variance.
3) Labour efficiency variance.
4) Labour mix variance.

Problem 9 : (Fixed Overhead Variances)

From the following data, calculate overhead variance:

	Budgeted	Actual
Fixed Overhead	Rs. 3,75,000	Rs. 3,77,500
No of working days	25	27
Man hours per day	5,000	5,500
Output per man hour in units	2	1.9

3.7 Reference to further study

1) Dr. Maheshwari S. N: Principles of Management Accounting, Sultan Chand & Sons, New Delhi.
2) Man Mohan, S. N. Goyal: Principles of Management Accounting, SahityaBhavan, Agra.
3) Pandey I. M.: Management Accounting, Vikas Publishing House Pvt. Ltd., New Delhi.
4) Paul S. Kr.: Financial Statement Analysis, New Central Book Agency (P) Ltd. Kolkata.
5) Raman B. S.: Management Accounting, United Publishers Mangalore.

❑❑❑

Unit-4

Price Level Changes or Inflation and Financial Management

Structure of Unit

4.0 Objectives

After studying this unit you will be able to:

1. Understand the meaning and relevance -concept, features, objectives of Price level changes or Inflation accounting.
2. Learn limitation of historical accounting and methods of price level changes or inflation accounting
3. Know about inflation and financial decisions.
4. Understand the CPP and CCA methods, objectives, features, advantages and disadvantages.
5. Know the concepts of COSA, MWCA, Depreciation Adjustment, Gearing Adjustment under CCA.
6. Prepare Current cost Reserve Account and Revaluation surplus, Restatements of Profit & Loss account and Balance Sheet.

4.1 Introduction:

Accounting presents true and fair financial position of any business by preparing the financial statements to its internal and external users. Accounting concepts and conventions are playing a vital role in preparation of financial statements. To carry on all operating and financial activities of any business, the money measurement concept is a basic attribute of accounting. Under this concept the transactions are expressed in the form of money or money's worth. Money or currency is the medium of business transactions of any country. Our country has a measuring unit is "Rupee" which is stable unit of value. The value of rupee changes due to the inflation. Also there is always change in the price level due to the economic conditions like inflation, depression, depression etc. Inflation indicates the state of continuous rise in prices. It brings downward changes in the purchasing power of monetary unit. Therefore, business prepares its financial statements without considering the change in purchasing power of the monetary unit loses their significance. There is a need to prepare inflation adjusted financial statements. There are different methods to prepare such inflation adjusted financial statements in inflation accounting. Such accounting is also known as accounting for price level changes.

4.2 Presentation of subject Matter

This topic contains accounting of companies with restated figures or due to the change in the price level, which is known as price level changes or inflation accounting. We will get knowledge of price level changes and its relevance, historical accounting, inflation and financial decisions, limitations of preparation of the restatements of Profit and loss account and Balance sheet under CPP and CCA method. While preparing the statements one should consider the concepts like depreciation adjustment, COSA, MWCA, Gearing adjustment, current cost reserve, revaluation surplus etc.

4.2.1 Meaning and Relevance of Price level changes or Inflation Accounting:

Inflation refers to the decrease in purchasing power of money due to an increase in the general price level. According to The Penguin Dictionary of Economics, "Rise in prices brought about by the expansion of the supply of bank money, credit etc".

Inflation is nothing but an unexpected expansion of currency and credit beyond the necessities of trade, commerce and industry. Inflation is occurred due to several reasons such as production failure due to strikes or lockouts in the business, an increase in cost of production, shortage of agriculture products due to natural calamities, monopoly and speculative market conditions etc. The cause of inflation affects economic system of any country. During the inflation period the general price levels increases and the value of money falls and vice versa. Due to this situation an accountant faces the problems in accounting of the business. As a result, the accountants in India are doing accounting with conventional methods as assuming that the value of rupees is stable. e.g suppose the general base price index is 100 in 1990 and it is increased to 1000 in the year 2000, it means it has gone up by ten times during the period. But it is neglected by the accountants in India. Therefore, the meaning of inflation accounting cab be understood by following ways:

1. Inflation accounting is the practice of adjusting financial statements according to price indexes,
2. The IAS 29 of the International Financial Reporting Standards (IFRS) defines, hyperinflation as prices, interest, and wages linked to a price index rising 100% or more cumulatively over three years.
3. It is the system of accounting which records all economic and financial activities related to the business in terms of current cost is known as inflation accounting.
4. In inflation accounting the historical costs are to be changed on the basis of current costs. The historical financial statements changed on the basis current costs for updating information.
5. The numbers are restated to reflect current values as well as the Restatement of financial statements to reflect the effect of changes in the general price level is known as accounting for price level changes or inflation.
6. Inflation accounting also states about reporting dates and maintenance of accounting with current cost.

Rate of Inflation:

Inflation refers to a steady rise or growth in the prices of various goods and services in the economy. Inflation is measured on a year-on-year basis. For example,

Suppose, there is an inflation of 6% in April 2024 in India, it means prices of goods and services have increased by 6% when it is compared to the prices in April 2023.

It is usually expressed as a rate as follows:

Rate of Inflation = (Price in this/current Period – Price in the Previous Period) X 100/Price in the Previous Period

4.2.1.1 Objectives and Importance of Price level changes or Inflation Accounting:

The following points show the objectives and importance of Price level changes or Inflation Accounting:

1. **True financial position:** Inflation accounting shows true financial position of business by reflecting all books of accounts at current price. It adjusts all record as per current price index for determining real profitability.
2. **Avoids profit overstatement:** This branch of accounting keeps eyes on financial statements of business for avoiding any overstatements of profits. All expenses and income are considered at current values which avoids overstatement of profit.
3. **Correct amount of depreciation:** Inflation accounting charges correct amount of depreciation by calculating it on present value rather than historical value. This helps business in easy replacement of assets.
4. **Easy profit comparison:** Inflation accounting helps business in comparing inter-periods performance of various activities for determining their profitability. Inflation accounting also helps in avoiding distortion of historical data by adjusting effects of prices changes on all expenses and incomes which are shown in financial statements.
5. **True and fair information:** Inflation accounting provides true and fair information based on present price level to its shareholders and employees. Due to this information, it enables the business in determining of satisfactory dividend policy towards shareholders and high wages to the employees.

4.2.1.2 Features of Price level changes or Inflation Accounting :

1. **Presents true position:** Inflation accounting presents true and fair financial position by showing all changes as per the current price index. Hence, we get updated financial statements with current price index.
2. **Inter period comparison:** Due to the preparation of profit & loss account and Balance sheet with current value or index, it is easy to make inter period comparison of profitability, income and expenditures etc. for future decision making.
3. **Remove distortions:** Inflation accounting helps in removing all misrepresentations arising due to historical data and makes accounting records updated with current values.
4. **Avoids Mis-leading deeds:** Due to the historical accounting, data shows the higher profitability in the business. It results in huge wages demand by employees. The inflation accounting helps such misleading deeds by showing current financial position. Hence, the employees also understand the situation in the business without any query.
5. **Efficient decision making:** Inflation accounting provides true and fair picture of business organization, As a result the management can take any decision very effectively and efficiently.
6. **Inbuilt automatic mechanism:** Inflation accounting has an inbuilt and automatic mechanism to do the adjustments as per changing price level and update the books of accounts. Hence, the business can get real financial position of the business.

4.2.1.3 Limitations of Historical Accounting:

The limitations of historical cost accounting include:

1. Failure to disclose the current worth of the enterprise:

The historical cost accounting fails to disclose the current worth of the enterprises. It cannot show many effects that arises due to the inflation gap. Hence, it cannot reflect a true and fair view of enterprise.

2. Incomparable items in financial statements:

During the inflation, certain items show higher values in the financial statement, it does not mean there is progress made by an enterprise. For example, if the enterprise has sales for three years may be Rs. 2,00,000, Rs. 6,00,000, and Rs. 3,80,000. In this case, the higher sales figures of any enterprise are attributable to inflation and not to an increase in sales. When we covert such sales against common index number, it will show the same sales as it's earlier.

3. Replacement of fixed assets:

Under the historical cost concept, depreciation is charged on the original cost. Under inflation, the cost of fixed assets increases, and so the rate of depreciation is not sufficient to replace fixed assets. Hence it is difficult to replace the fixed assets.

4. Determination of Incorrect profit:

Historical cost accounting does not reveal the accurate or correct profit or loss in an inflationary condition. Under inflation, more profit is always shown due to over-valuation of closing stock. In this cases, there is an increase in income tax burden and on the other hand, employees may demand higher salaries with other perks. The distribution of profits in the form of dividends does not add to the general reserves.

5. **Mixing up of holding and operating profits:**

Historical cost accounting does not disclose the effect of closing stock on profit. As a result, profit due to the overvaluation of stocks is mixed up with business profits, and does not show the correct profitability.

4.2.1.4 Inflation and Financial Decisions:

Inflation significantly influences financial decisions in various ways:

1. **Purchasing Power**: As inflation rises, the purchasing power of money gets decline. It means that the same amount of money buys fewer goods and services over time. Therefore, Individuals and businesses have to change their spending and saving habits to avoid loss in value.
2. **Interest Rates**: The Reserve Bank or the Central banks, like the Federal Reserve, often adjust interest rates to manage inflation. It is necessary to know that the higher inflation leads to higher interest rates. Due to this, there is an,

increase in borrowing costs for consumers and businesses. On the other hand, lower inflation can lead to lower interest rates, making borrowing cheaper.

3. **Investment Decisions**: while Inflation there is always impact on the real returns on investments. As a result, the investors may invest their money in those assets that traditionally outpace inflation, such as real estate or stocks, to preserve their wealth. Bonds and fixed-income investments may become less attractive during high inflation periods due to their fixed returns.
4. **Debt Management**: Inflation can affect the real value of debt. For borrowers, inflation can be beneficial as it reduces the real value of fixed-rate debt over time. However, the lenders can get the real returns on loans during inflation.
5. **Cost of Living**: During the period of inflation, the cost of living increases the prices of commodities, goods and services go high. Hence the budget of households can be affected. People may need to save money and adjust their spending on essentials like food, housing, and healthcare.
6. **Pricing Strategies**: During the inflation, Businesses have to reduce their excess cost on material and labour. They have to determine their pricing strategy to maintain profitability during inflationary periods. This can involve increasing prices to cover higher costs of raw materials and labour.

4.2.2 Accounting for Price Level Changes

It is necessary to understand the prices do not constant over a period of time. It varies according to the economic, financial, political, social etc. factors may change. There is a variation in price level due to economic conditions i.e inflation and deflation. It leads to inaccurate financial positions of the organization, therefore for maintaining true and fair financial statements accounting under price level changes is must. It reflects the current values of items related to the financial statement. It has certain methods of accounting.

4.2.2.1 Methods of Price Level Changes or Inflation Accounting:

It is a system to maintain accounts in which for Inflation accounting is known as Accounting for Price level changes. The price level changes are classified into – a) General price level changes and b) Specific price level changes.

a) General Price level Changes:

It reflects the overall increase or decrease in the value of monetary unit. the most suitable examples of this is the changes in wholesale price index (WPI) or the consumer price index (CPI).

b) Specific Price level Changes:

It refers to changes in the price of a specific asset. In this case, it is noted that the price of a particular asset do not follow the same trend as WPI or CPI.

As a result the following methods are generally accepted:

1. Current Purchasing Power (CPP) method OR General Purchasing Power (GPP) Method based on changes in general price level changes.
2. Current Cost Accounting (CCA) method, based on changes in prices of specific assets.
3. Hybrid Method i.e. a combination/ mixture of CPP and CCA methods.

4.2.2.2 Current Purchasing Power method:

Current Purchasing Power (CPP) Method is also known as General Purchasing Power (GPP) Method of inflation accounting. CPP method seeks to restate the financial statements of the business in terms of units of equal purchasing power. It results that there is no effect of changes in the money value. This method overcome the limitation of money changes its value from time to time. In simple sense, the items in the financial statements are converted into new figures on the basis of general price index at a given time or date.

4.2.2.3 Merits of Current Purchasing Power (CPP) Method:

Following are some of the merits or advantages of CPP method:

1. This method adopts the similar unit of measurement by taking into account the price changes.
2. The historical accounts continue to be maintained under this method. The statements of CPP are prepared on supplementary basis.
3. It facilitates the calculation of gain or loss in purchasing power due to the holding of monetary items.

4. Under this method, the comparative study is possible by using common purchasing power as measuring unit.
5. It provides reliable financial information; hence it is easy to take management decision for formulating plans and policies.
6. CPP makes sure to keep intact the purchasing power of capital contributed by shareholders.

4.2.2.4 Demerits of Current Purchasing Power (CPP) Method:

Following are the demerits of the CPPP method:

1. It shows only the changes in general purchasing power. It does not consider the changes in the value of individual or single items.
2. It is based on statistical index number, hence not used by most of the business firms.
3. It makes the problem in determining a suitable price index.
4. This method fails to eliminate all the defects of historical cost accounting system.

4.2.2.5 Steps of Current Purchasing Power (CPP) Method

The following steps are to be followed for preparing financial statements under the CPP method of accounting for price level changes.

(1) Calculation of Conversion Factor

CPP method includes the restatement of historical figures at current purchasing power. Therefore, historical figures must be multiplied by conversion factors.

The conversion process of historical figures into CPP figures involves two steps:

i) Multiplying the Historical Cost figures by the price index at the end of the period;

ii) Dividing the figures obtained in Step (i) above by the index which existed at the date of original transaction.

$$\text{Conversion factor} = \frac{\text{Price Index at the date of Conversion}}{\text{Price Index at the date of Transaction}}$$

OR

$$\text{Conversion Value} = \frac{\text{Price Index at the date of Conversion}}{\text{Price Index at the date of Transaction}} \text{ x Existing value}$$

OR

$$\text{Conversion Value} = \frac{\text{Price Index Number of Current year}}{\text{Price Index Number of Base year}} \text{ x Historical Cost of Asset}$$

Illustration 1.

A Company purchased a machine costing Rs.200000 on 1st January, 2023 when the retail price index was 300. You are required to restate the value of machine on 31st December, 2023. Assume that the price index to be at 750 on that date according to Current purchasing power.

Solution:

Cost of Machine on 1st January, 2023 Rs. 2,00,000

Index on 1st January, 2023 was 300

Index on 31st December 2023 is 750

$$\text{Conversion Value} = \frac{\text{Price Index Number of Current year}}{\text{Price Index Number of Base year}} \text{ x Historical Cost of Asset}$$

Conversion = 750/300 x 200000 = Rs. 5,00,000

It is possible that the same machine can be purchased for Rs. 5,00,000 but under Current Purchasing Power Method (CPP) the real price of 2020 will not be considered, on the other hand price changes on the basis of general price level index numbers are considered.

Following considerations are made under Current Purchasing Power (CPP) Method.

1. For conversion of Historical amount: Multiply Historical amount with the division of index number on the date of valuation and Index number on the date of existing amount.

   Index number on the date of valuation / Index number on the date of Existing amount x Historical amount

2. If the items like purchases, sales, wages and advertisement expenses etc. occurred through out the year, the average index number is to be considered and made conversion.

Index number at the end of the year / Average Index Number x Converted items

Average Index Number =

$$\frac{\textbf{Index number at beginning of the year + Index number at the end of the year}}{2}$$

It is noted that opening stock, closing stock and depreciation are not converted with this index number. Only Trading and Profit & Loss Account debit and credit recorded items are to be considered. If average index number is not given, above such index number is to be used. It is also known as "Mid Period Conversion".

3. Adjusted amount of receipts, payments and working capital can be calculated on the basis of index numbers and at the end of the year monetary capital is calculated. If Real monetary working capital is more than such capital amount under CPP, the excess amount is known as Profit and if it is less then there is loss. It is possible to calculate profit or loss only on monetary items.

   Profit = Actual Amount -- CPP Amount

   Loss = CPP Amount -- Actual Amount

4. General price index number of retail price should be used.

Illustration 2

On 1st January 2023, a company purchased a printing machine at a cost Rs. 15,00,000. At the same time the general price index number was 500. The market value of printing machine on 31st December, 2023 was Rs.20,00,000 and general price index number was 750.

Calculate the profit or loss on machinery under Current Purchasing Power (CPP) Method.

Solution:

Conversion Value of Printing Machine =

$$\frac{\text{Price Index Number of Current year}}{\text{Price Index Number of Base year}} \text{ x Historical Cost of Asset}$$

= 750 / 500 x 15,00,000

= Rs. 22,50,000

Value of Printing Machine on 31st December, 2023 = Rs. 22,50,000

But Market Value of Printing Machine on 31st December, 2023 = Rs.17,50,000

Hence, Loss = Value under CPP -- Actual Value

= 22,50,000 -- 20,00,000

= Rs. 2,50,000

(2) Monetary and Non-monetary Accounts

CPP method categorizes all assets and liabilities into two groups viz. a) Monetary items and B) Non-monetary items.

a) Monetary Items:

In case of monetary items, the values of these items are fixed and there is effect of change in price level. Monetary items involve assets and liabilities, amount receivable or payable only at a current monetary value. Monetary assets consist of cash, bank, bills receivables, debtors, prepaid expenses, account receivables, investment in bond or debentures, accrued income, etc. On the other hand, Monetary liabilities involves creditors, accounts payable, bills payable, outstanding expenses, notes payable, dividend payable, tax payable, bonds or debentures, loan, advance income, preference share capital, etc.

The CPP method comprise of assets and liabilities such as Debtors, cash, creditors etc. This method assumes that the value of these assets on the Balance sheet date reflect the CPP as at the end of the previous year.

Such figures are converted into CPP figures as follows:

$$\text{Historical Cost} \times \frac{\text{Index at the end}}{\text{Index on the date of Balance Sheet}}$$

b) Non-monetary Items: Those items which do not fixed monetary value are known as non-monetary items. There is a need to restate the value for representing the current general purchasing power. Non-monetary accounts consists of land, building, machinery, vehicles, furniture, inventory, equity share capital, irredeemable preference share capital, accumulated depreciation, etc.

Non-Monetary Assets are converted under following three heads:

a) Fixed Assets b) Depreciation c) Stock d) Shareholders Funds

i) Fixed Assets =

$$\text{Historical Cost figures} \times \frac{\text{Index at the end}}{\text{Index on the date of Acquisition}}$$

ii) Depreciation =

$$\text{Accumulated Depreciation} \times \frac{\text{Index at the end}}{\text{Index on the date of Acquisition}}$$

If assets are acquired over a period of time, the calculations are to be done separately for each of the acquisition.

iii) Stock

While converting Historical cost of stock, the first step is to find the period during which the items in stock were purchased and then a price index representative of the price level during such period is identified.

iv) Shareholders Funds:

It is not possible to convert shareholders funds i.e. share capital + Accumulated Reserves on historic cost figures into CPP figure by multiplying with any specific index. It is arrived at by subtracting all liabilities at CPP from the assets both fixed and current at CPP.

(3) Gain or Loss on Monetary items

As stated that there is no any effect of changes in price level on monetary items . They are fixed in amounts either receivables or payables. The change in purchasing power of money has an effect on monetary assets and monetary liabilities, Therefore, the holding of such items results in gain or loss in terms of real purchasing power. This gain or loss is denoted as general price level gain or loss.

Illustration No.3

The following data are available from the books of M/s Atharv Ltd as on 31st March 2024

Particulars	1st April 2023	31st March 2024
Cash	3500	4,500
Book Debts	25,000	30,000
Creditors	18,000	22,000
Loan	40,000	40,000
Retail Price Index Number 1st April 2023 31st March, 2024 Average for the year	 240 360 300	

You are required to work out the net monetary result of the company as at 31st March 2024.

Solution :

i) Monetary Liabilities at the beginning of the year:

Creditors Rs. 18,000 + Loan Rs. 40,000 = Rs 58,000

CPP Value at the end of the year = $\frac{58{,}000 \text{ x Index at the end of the year}}{\text{Index at the beginning of the year}}$

= 58000 x 360/240 = Rs. 87,000

Increase in Monetary Liabilities during the year:

Creditors: Rs 22,000 – Rs. 18,000 = Rs 4,000

Loan: Rs. 40,000 –Rs. 40,000 = $\frac{\text{Rs. NIL}}{4{,}000}$

CPP Value at the end of the year = 4,000 x $\frac{\text{Index at the end of the year}}{\text{Average Index for the year}}$

= 4,000 x 360/300 = Rs. 4,800

Thus, CPP value of Monetary Liabilities at the end of the year = 87,000 + 4,800

= Rs. 91,800

Less: (-) Actual value (as per HCA) at the end of the year = 22,000+40,000

Rs. 62,000

Monetary Gain on account of increase in Liabilities (A) = Rs. 29,800

ii) Monetary Assets at the beginning of the year:

Cash 3,500 + Book Debts 25,000 = 28,500

CPP value of above at the end of the year = 28,500 x 36/240 = 42,750

Increase in Monetary Assets during the year:

Cash: Rs. 4,500 - Rs. 3,500 = Rs. 1,000

Book Debts: Rs. 30,000 – Rs. 25,000 = Rs. 5,000

Rs. 6,000

CPP value of Increase at the end of the year = 6,000 x 360/300 = Rs. 7,200

CPP Value of monetary Assets at the end of the year = 42,750+7,200 = Rs. 49,950

(-) Actual value (as per HCA) at the end of the year = 4,500+30,000 = Rs. 34,500

Thus, **Monetary loss on account of increase in Assets (B) = Rs. 15,450**

Net Monetary Gain **= A - B =** Rs. 29,800 - Rs. 15,450 = Rs. 14,350

(4) Valuation of Cost of Sales and Inventories

According to the change in method of valuation of inventories i.e Last in First out (LIFO) and First In First Out (FIFO), the Cost of sales and inventory value varies. In case of FIFO, the good purchased first are sold first to the customers while in case of LIFO; the good purchased at the latest are issued at first to the customers. It is must to state the method of application while restating the figures under Current Purchasing Power (CPP) method.

Under this method, current purchases are considered as Average index of the year, similarly, purchase for the last year is also considered as Average index for the last year(s) and the indices for opening stock is used as index at the beginning of the year.

a) First In First out:

It Comprises –

Cost of Sale = [Opening Stock + Purchases] – Closing Stock

Closing Stock = From current or latest purchases

Or

Closing Stock = [Opening Stock + Purchases] – Cost of sale

It means if the opening stock is excess over cost of sale, the unsold goods are known as closing stock.

b) Last In First Out:

In this case, there is shortage in opening stock due to cost of goods sold is excess over latest or current purchases.

Cost of Sale = Current or Latest Purchases

Closing stock = Purchases of the last/previous year(s).

Illustration 4

Following is the details of M/S. Shambhavi Industries for the given period.

Particulars	**Historical Cost**	**Price Index**
Opening Stock on 1st April, 2023	10,000	100
Purchases during the year 2023-2024	50,000	130
Closing Stock	45000	125
Index No. on 31st Marck,2024		140

Ascertain- 1) Cost of Sale 2) Closing Inventory as per CPP method under FIFO.

Solution:

Cost of Sale and Closing Inventory as per CPP method under FIFO

Particulars	**Historical Cost**	**Conversion Factor**	**Converted Amount as per CCP)**
Opening Stock	10,000	140/100	14,000
Add Purchases	50,000	140/130	53,846
	60,000		**67846**
Less- Closing Stock	45,000	140/125	50,400
Cost of Goods sold	**15,000**		**17,446**

Illustration 5

Following is the details of M/S. Manjushri & Co for the given period.

Particulars	Historical Cost	Price Index
Opening Stock on 1st April, 2024	20,000	110
Purchases during the year 2024-2025	1,30,000	125
Closing Stock	22,000	150

Ascertain- 1) Cost of Sale 2) Closing Inventory as per CPP method under LIFO.

Solution:

Cost of Sale and Closing Inventory as per CPP method under LIFO

Particulars	Historical Cost	Conversion Factor	Converted Amount as per CCP)
Opening Stock	20,000	150/110	27,272
Add Purchases	1,30,000	150/125	1,56,000
	1,50,000		**1,83,272**
Less- Closing Stock			
From opening stock	(20,000)	150/110	(27272)
From Purchases	(2,000)	150/125	(2400)
Cost of Goods sold	**1,28,000**		**1,53,600**

Note: The figure derived of Closing Stock as -

Closing Stock = Opening Stock + Additional Purchases (Bal. fig)

22000 = 20000 + 2000 (Bal. Fig)

(5) Restated Income Statement/ Determination of Profit:

The further step in under CPP method is to determine profit or income. It has two different methods to determine profit as-

a) Net Change Method

According to this method, the profit is the change in equity during an accounting period. The openings and closing balance sheets are converted into CPP terms with

the help of appropriate index numbers. The difference in the balance sheet is considered as reserves after converting the equity capital also.

If equity capital is not converted, the difference is treated as equity capital or it may be taken as the balancing figure. In case of closing balance sheet, the monetary items will not change, only non-monetary items are to be converted. Under this method -a) where equity capital is converted the Profit is calculated as the net change in reserves and 2) where equity is not converted the profit will be equal to net change in equity.

Hence, Profit is net changes in reserves or equity capital as the case may be.

b) Conversion or Restatement of Profit/ Income Method:

According to this method-

i) the historical income statement is converted under CPP.

ii) Purchases, sales and other expenses are converted at average index which are incurred throughout the year.

iii) Cost of sales is converted as per the assumptions of FIFO and LIFO.

iv) Depreciation can be calculated on converted values and also the fixed assets are converted from the date of acquisition on the basis of index.

v) The expenses like dividend or tax paid are also converted on the basis of indices from the date of payment.

v) Monetary gain or loss is also ascertained and shown separately in Restated income statement to ascertain profit or loss under the CPP accounting method.

Illustration 6 : Samarjit Ltd. furnishes the following income statement for the year ending 31st March, 2024 on the basis of conventional accounting. You are required to adjust the same for price level changes under CPP method.

Particulars	Amt (Rs)	Amt (Rs)
Sales		1,80,000
Less: Cost of goods sold:		
Opening Stock	16,000	
Add: Purchases	1,20,000	
Less: Closing Stock	12,000	1,24,000

		56,000
Less: Expenses		
Wages & Salaries	12,000	
Other Expenses	9000	
Depreciation on Building	1400	
Interest	600	23,000
Net Income		33,000
Less : Dividend		8,000
Retained Earnings		**25,000**

Additional Information:

1. Index of general price level was on 1st April, 2023 as 200 and on 31st March, 2024 as 400 and Average index was 300.
2. Interest and dividend are paid at the end of the year.
3. Index was 100 while building purchased.

Solution:

Restated Income statement of Price Level Changes as per CPP method

Particulars	Amt (Rs)	Conventional Amt (Rs)	Conversion Factor	Adjusted Values (Rs)	
Sales		1,80,000	400/300		2,40,000
Less: Cost of goods sold:	16,000		400/200	32,000	
Opening Stock	1,20,000		400/300	1,60,000	
Add: Purchases	12,000	1,24,000	400/300	16,000	176000
Less: Closing Stock					
		56,000			64,000
Less: Expenses					
Wages & Salaries	12,000		400/300	16,000	
Other Expenses	9000		400/300	12,000	
Depreciation on Building	1400		400/100	5600	
Interest	600	23,000	400/400	600	34,200
Net Income		33,000			29800

Less : Dividend		8,000	400/400		8000
Retained Earnings		25,000			21800

Check Your Progress 1

Fill in the blanks:

1. The value of rupee changes due to the ----------
2. Inflation refers to the decrease in ---------- of money due to an increase in the general price level.
3. Inflation accounting also states about reporting dates and maintenance of accounting with --------current cost.
4. It adjusts all record as per ---------- for determining real profitability.
5. ---------- provides true and fair information based on present price level to its shareholders and employees.
6. Inflation accounting is known as ----------.
7. It reflects the overall increase or decrease in the value of ----------.
8. Current Purchasing Power (CPP) Method is also known as ----------Method of inflation accounting.
9. ----------method includes the restatement of historical figures at current purchasing power.
10. Historical figures must be multiplied by ----------conversion factors.
11. Those items which do not ----------monetary value are known as non-monetary items.
12. Cost of Sale = [Opening Stock + ----------] – Closing Stock
13. The difference in the ---------- is considered as reserves after converting the equity capital also.
14. If ----------equity capital is not converted, the difference is treated as equity capital or it may be taken as the balancing figure.

4.2.2.6 Current Cost Accounting Method:

Current Costing Accounting (CCA) method is an alternative method to Current Purchasing Power (CPP) method that it was introduced in 1975 to overcome the

problems of CPP method. The British Government had appointed a committee as Sandilands Committee under the chairmanship of Mr. Francis C.P. Sandilands to study and recommend the accounting for price level changes. The committee finalized the issue of SSAP 16 (Statement of Standard Accounting Practice). And presented its report in the year 1975 and recommended to adopt Current Cost Accounting Technique instead of Current Purchasing Power of Replacement Cost Accounting Technique for price level changes.

Under this method current price of each item is considered and not the historical prices of the items in financial statement. It is also called as Replacement cost. This method is used as "Value to the business" as the measurement basis. The value is determined as Net current Replacement cost or Recoverable amount which is more to net realizable value of an asset.

Current cost can be calculated by following three ways:

a) Net Current Replacement Value:

b) Net Realisable value

c) Economic or Recoverable value

a) Net Current Replacement Value:

This is the cost of new one purchased asset on the date of balance sheet. The said purchases price is at gross value. The depreciation on old asset used is to be deducted from the gross value and the remaining balance is known as net replacement cost.

b) Net Realisable Value:

If the old one asset sold on the date of balance sheet, at the same time the net price of the asset will be realized. Such amount is known as Net Realisable Value.

c) Economic or Recoverable Value:

If the net income earned from the present or existing asset during its remaining life, it is known as Economic or Recoverable value. This is also called as discounted present value. E.g. if the machine has 4 years lifespan and earning per year Rs.5,000 after maintenance of Rs. 2000 on it. The net income is earned during 4 years will be Rs. (5000 – 2000) x 4 years = Rs.12,000.

It is presumed that the net current replacement cost is the best method of all.

4.2.2.7 Objectives of Current Cost Accounting (CCA):

1. CCA provides correct and reliable financial information on the basis of current replacement cost.
2. It determines the profit without changing the historical profit.
   3. CCA protects the business in the event of normal inflationary situation.
   4. To maintain capital position by making valuation of assets in proper value based on replacement value.
5. CCA provides realistic information to the management, investors, creditors, government and to other interested parties.
6. On the basis current values, it is possible to prepare financial statement at the end of the year.

4.2.2.8 Features of Current Cost Accounting method:

The following are some of the features-

1. The fixed assets are shown in the balance sheet at their replacement cost or current values and not on historical costs.
2. The depreciation on fixed assets is charged at the current values or replacement cost and not on original cost.
3. Inventories are valued in the balance sheet at their current replacement costs or market value and not as cost or market price whichever is less.
4. The cost of goods sold is calculated on the basis of their replacement cost to the business and not on their original cost.
5. The surplus on revaluation is transferred to Current Cost Accounting Reserve and are not available for distribution as dividend to the shareholders.
6. Balance sheet, profit and loss account, appropriation account and a statement of changes are prepared. The profit from operation and profit on revaluation are also calculated.

7. Liabilities are recorded in their original value due to there is no any change in monetary unit.

After all, Current Cost Accounting method faces the problems in operating as:

(a) difficult to determine the 'Value to the business' of a real asset.

(b) an element of subjectivity in this method.

(c) Not good during the periods of depression.

4.2.2.9 Merits of Current Cost Accounting Method:

Following are some of the advantages of Current cost Accounting Method:

1. This method provides realistic information about the values of assets, cost of various business items and income or profit.
2. It makes the difference between income / gain from operations and income from holding assets.
3. This method is used as "Value to the business" as the measurement basis. Depreciation is calculated on such value of business.
4. After charging depreciation on current values of fixed assets, it is easy to replace them with sufficient available funds under CCA method.
5. The business efficiency in the inflation period can be shown with the help of a statement of changes in equity.
6. Cost of Sale Adjustment (COSA) assists to determine value of business in real terms.
7. As compared to CPP method, CCA technique adopts a book keeping system.

4.2.2.10 Demerits of Current cost Accounting Method:

Following are the disadvantages of CCA method:

1. Under this method the company cannot distribute profit as per the requirement for replacement of asset that company charge backlog depreciation against current cost accounting reserve (capital reserve) cannot charge backlog depreciation against revenue reserve (available for Dividend). But it must to charge against on revenue reserve.

2. This system avoids to do gearing adjustment against value of stocks and fixed assets of the company.
3. No uniform accounting system is applied by various companies. But under CCA method needs it requires uniform accounting method.
4. This method avoids to consider gains or losses on monetary items of company.
5. Due to the different depreciation policy and inadequate fund, it fails to acquire a new asset to the company against replacement of asset.

4.2.3 Preparation of Accounts under CCA method:

Current Cost Accounting method (CCA) is very useful in the preparation of following accounts:

i) Current Cost Profit and Loss Account

ii) Current Cost Balance Sheet.

4.2.3.1 Current Cost Profit and Loss Account:

This account is to be prepared to determine Current Cost Operating profit and loss. CCOP is calculated before interest on net borrowings and taxation. It helps to determine the need of funds required in operations of the business. Current cost profit and loss account is determined after considering three important adjustments of depreciation adjustment, Cost of Sale Adjustment (COSA) and Monetary Working Capital Adjustment (MWCA) before interest and tax. After considering these adjustments, we derived the value of net income after interest and tax. This income is distributed among the shareholders after considering operational capabilities as a surplus amount**.**

4.2.3.1.1 Depreciation Adjustment:

The Depreciation adjustment is calculated by two ways:

a) On the basis of total replacement cost of the asset:

It is the difference between Required depreciation on the current cost of fixed assets and depreciation charged under historical cost.

This is calculated as:

Depreciation Adjustment = Required Depreciation under CCA -- Depreciation Charged under HCA

b) On the basis of Average current cost of the asset:

Average Current Cost = $\frac{\text{Opening current cost of Asset+Closin Current Cost of Asset}}{2}$

In this case following journal entry is to be passed.

Profit & Loss Account ---DR

To Current Cost Accounting Reserve

Illustration-8

A machine was purchased on 1st April 2013 for Rs. 2,40,000 when the price index was 100. The life of the machine was estimated to be 10 years having no scrap value. On 31st March,2021 the relevant price index was 150. Calculate amount of Depreciation Adjustment.

Solution:

Particular	Historical Cost	Index factor	Current Cost
Value of machine Rs.	2,40,000	150/100	3,60,000
Accumulated Depreciation	1,20,000		1,80,000
Depreciation Adjustment	1,20,000		1,80,000

Current cost depreciation p.a. 10% of Rs. 360000 = Rs. 36000

Historical cost depreciation p.a. 10% of Rs. 2,40,000 = Rs. 24,000

Depreciation Adjustment = Rs. 12000

Backlog Depreciation:

Backlog depreciation is the short depreciation every year on revaluation of fixed asset. The backlog depreciation is the amount needed to cover total depreciation provision based on current cost at the end of the year.

This backlog depreciation arising out of increase in current costs is to be charged either to the "Current Cost Accounting Reserves" or "credited to the provision for Depreciation Account".

Illustration: 9 Calculate the Back log Depreciation from the following:

Current cost of an Asset Rs. 20,00,000

Depreciation rate 10% per year

Life of asset 3years

No scrap value is to be given.

Depreciation provision is made duriong the years Rs.5,20,000

Solution:

	Rs.
Depreciation provision on Current cost Rs.20,00,000 @ 10% for 3 years	6,00,000
Less: Depreciation provision during the years	5,20,000
Backlog Depreciation	80,000

4.2.3.1.2 Cost of Sales Adjustment (COSA):

It is the difference between current cost of stock at the date of sale and amount charged as the cost of goods sold under historical cost profit. If the sales are at current costs, there is no need of adjustment of sales, sometimes all the factors of cost of sales are not on current cost, then they are adjusted with current cost.

There is a need of adjustment when stock is inclusive in the cost of sale. It is because of rest amounts of cost of sales are at current prices. This adjustment is called Cost of Sale Adjustment.

Following are the methods of Cost of Sale Adjustment:

a) Average current cost of closing stock:

=Average Index Number / Closing Index Number x Closing Stock

b) Average current cost of opening Stock

= Average Index Number / opening Index Number x opening Stock

c) **Cost of Sale Adjustment =** Average current cost of closing stock –(less) Average current cost of opening Stock

COSA = (HCCS – HCOS) – Av. Index [HCCS/Cl. Index - HCOS/Op. Index]

Here,

HCCS = Historical Cost of Closing Stock

HCOS = Historical Cost of Opening Stock

Op. Index = Opening Index

Cl. Index = Closing Index

Av. Index = Average Index

COSA is debited to P/L Account and credited to Current Cost Accounting Reserve Account.

Illustration 10: Calculate cost of sales adjustment from the following data of M/S. Nibhish & Co.

Particulars	Rs
Opening Stock	4000
Add: Purchases	8000
	12,000
Less: Closing Stock	2000
Cost of Goods sold at Historical Cost	10,000
Price level during the year:	
Opening	100
Closing	120
Average	110

Solution:

COSA = (HCCS – HCOS) – Av.Index [HCCS/Cl.Index - HCOS/Op.Index]

= (2000 -4000) – 110 [2000/120 - 4000/100]

= 567

OR

Alternate Method,

Revised stock as per average stock:

Opening stock = 4000 x 110/100 = Rs.4400

Closing stock = 2000 x 110/120 = Rs. 1833

Current cost of sale on the basis of revised stock

Cost of Sales on current basis = OP. Stock + Purchases - Cl.Stock

= 4400 + 8000 – 1833

= Rs.10567

COSA = Cost of Sales on current basis - Cost of Sales on historical basis

= 10567 - 10000

= Rs. 567

4.2.3.1.3 Monetary Working Capital Adjustment (MWCA):

The Monetary Working Capital is taken as the difference between Trade Debtors and Trade creditors.

Monetary Working Capital = (Trade Debtors including B/R, Prepayments, Amt. of the stock which is not included in Cost of goods sold) – (Trade Creditors including B/P, Bank overdraft which relates to stock only)

In case of banks and other financial institutions, MWCA covered assets and liabilities are also related to operating activities of the business.

The MWCA refers to the additional or lesser amount is needed for monetary working capital as per the change in input. Hence, the finance is required.

While calculating MWCA, if the creditors are more than the debtors, the negative working capital arises. Such negative working capital is added in borrowings for calculating gearing ratio and gearing adjustment.

Steps in Calculation of MWCA:

1. Calculate opening and closing MWC by above formula.
2. Take difference between Closing and Opening MWC.
3. Adjust Opening and Closing MWC with general price indices.

4. Take difference between closing MWC and opening MWC.
5. In the last deduct amount of no (2) from No (4).
6. The amount is treated as MWC Adjusted.

The formula of MWCA is similar to COSA.

MWCA = [Cl. MWC - Op. MWC] - Av. Index[Cl. MWC/Index Cl. MWC - Op. MWC/Index Op.MWC]

Llustration 11. Calculate from the data monetary working capital adjustment.

Historical Cost Balance Sheet

Particulars	1st January, 2023	31st Decemebr, 2023
Trade Debtors	120000	160000
Less: Sundry Creditors	100000	130000
Net Monetary Working Capital	20000	30000
Specific price index for finished goods-		
Opening Closing	100 120	

Solution

The average price index = 110

Cl.MWC = 160000 – 130000 = Rs. 30000

Op. MWC = 120000 - 100000 = Rs. 20000

MWCA = [Cl. MWC - Op. MWC] - Av. Index[Cl. MWC/Index Cl. MWC - Op. MWC/Index Op.MWC]

= [30000 - 20000] - 110[30000/120 - 20000/100]

= Rs.4500

OR

Alternate method,

Net Monetary Working Capital in terms of current cost

Opening MWC (1st January) : 20,000 X 110/100 = Rs. 22,000

Closing MWC (31st December) 30,000 x 1107120 = Rs. 27,500

Change due to volume = Rs. 27,500 – Rs. 22,000 = Rs. 5,500

Total change in MWC = Rs. 30,000 – Rs. 20,000 = Rs. 10,000

Monetary working capital adjustment = Rs. 10,000 – Rs. 5,500 = Rs. 4,500

The following journal entry is made to record monetary working capital adjustment:

Profit and Loss A/c Dr. 4,500

To Current Cost Reserve A/c. 4,500

4.2.3.1.4 Gearing Adjustment:

The COSA, MWC and additional depreciation are recorded in Profit and loss account. Such profit and loss is shown by profit and loss account is affected by this amount. As a result, the additional adjustment is made with the total amount of these amounts is known as Gearing adjustment.

The Gearing Adjustment Formula is:

Gearing Adjustment = Net Borrowings / (Net Borrowings + Shareholders Fund) x Total of the adjustment amounts of COSA, MWCA & Add. Depreciation

Net borrowings = All liabilities and provisions including convertible debentures and deferred tax but excluding dividends and items included in MWCA - (less) All current assets other than items included in MWCA and COSA.

The gearing ratio is the relationship between net borrowings and average net operating assets.

Average net operating assets = $\frac{\text{Opening net operating Asset + Closing net operating}}{2}$

On the basis of this the gearing ratio is calculated as:

Gearing Ratio = Average Net Borrowings / Average Net Operating Assets

In case banking or financial institutions, the Gearing Ratio is calculated when the current assets are excess over current liabilities. Here current asset is treated as bank balance.

Gearing ratio is also determined by using average equity capital:

Gearing Ratio = Average Net Borrowings / Av.Net Borrowings + Av. Equity capital

4.2.3.1. 5 Current Cost Reserve Account:

Under Current Cost Accounting (CCA) reserve account is to be maintained which is known as current cost reserve account.

The Current Cost Reserve consists of following important factors:

(i) Current cost adjustments viz. depreciation backlog adjustment, Cost of Sales Adjustment (COSA), Monetary Working Capital Adjustment (MWCA) and Gearing adjustment.

(ii) Current cost Reserve also includes un-realised revaluation surplus amount on fixed assets, closing stock and investment.

It is noted that the gearing adjustment amount is credited to profit and loss account and debited to Current Cost Reserve Account.

Check Your Progress: 2

Fill in the Blanks:

1. The British Government had appointed a committee as ---------- under the chairmanship of Mr. Francis C.P. Sandilands to study and recommend the accounting for price level changes.
2. The committee finalized the issue of ----------Statement of Standard Accounting Practice 16..
3. Under this method current price of each item is considered and not the historical prices of the items in financial statement. It is also called as ----------
4. CCA method is used as "----------" as the measurement basis.
5. The value is determined as ----------and ----------which is more to net realizable value of an asset.

6. The ---------- on old asset used is to be deducted from the gross value and the remaining balance is known as net replacement cost.

7. If the old one asset sold on the date of balance sheet, at the same time the net price of the asset will be realized. Such amount is known as ----------.

8. If the net income earned from the present or existing asset during its remaining life, it is known as Economic or Recoverable value. This is also called as ----------

9. ---------- are valued in the balance sheet at their current replacement costs or market value and not as cost or market price whichever is less.

10. ---------- is the short depreciation every year on revaluation of fixed asset.

11. ----------is debited to P/L Account and credited to Current Cost Accounting Reserve Account.

12. The ----------is taken as the difference between Trade Debtors and Trade creditors.

13. The COSA, MWC and additional depreciation are recorded in ----------

14. The ---------- is the relationship between net borrowings and average net operating assets.

15. Under Current Cost Accounting (CCA) reserve account is to be maintained which is known as ----------

16. ---------- also includes un-realised revaluation surplus amount on fixed assets, closing stock and investment.

Illustration:12

On 1st January, 2023 the amounts of share capital, debentures, long term loan and cash respectively were Rs. 6,00,000. Rs.3,60,000, Rs.1,00,000 and Rs.60,000. On 31st December,2023, the amounts of share capital Rs.7,00,000, debentures Rs.400,000, long term loan Rs. 120000 and cash Rs. 80,000

Adjustment for Cost of sale Rs.70000, Adjustment for Monetary Working capital Rs.80000 and Additional depreciation Rs.14000.

Calculate the amount of Gearing Adjustment under CCA method.

Solution:

Gross Borrowings 1.1.2023 Net Borrowings 1.1.2023	=Debentures + Long term loan =360000 + 100000 = Rs.460000 =Rs 460000 – 60000 (cash) =Rs.400000
Total of Net Borrowings & Shareholders funds	=Rs.400000 + 600000 = Rs 10,00,000
Gross Borrowings 31.12.2023 Net Borrowings 31.12.2023	=Debentures + Long term loan =400000 + 120000 = Rs.520000 =Rs 520000 – 80000 (cash) =Rs.440000
Total of Net Borrowings & Shareholders funds	=Rs.440000 + 700000 = Rs 1140,000
Total of Adjustments =	COSA + MWCA + Additional Depreciation =70000 + 80000 + 14000 = Rs. 1,64000

Gearing Adjustment = Net Borrowings / (Net Borrowings + Shareholders Fund) x Total of the adjustment amounts of COSA, MWCA & Add. Depreciation

= 400000 + 440000 / 1000000 + 1140000 x 164,000

= Rs.64374 Approx.

The Forms of profit and loss account, balance sheet and current cost reserve account under current cost accounting as follows:

Current Cost Accounting (CCA) Profit and Loss Account:

		Rs.
Historical profit before interest and tax		-
Less : Current cost operating adjustments:		
i) Depreciation adjustment	-	
ii) Cost of sales adjustment (COSA)	-	
iii) Monetary working capital adjustment (MWCA)	-	-
Current cost operating profit		-
Less : Interest on borrowings including debentures and dividend on preference shares		-
Current cost profit after interest		-

Add : Gearing adjustment*	-
Current cost profit before tax	-
Less : Provision for tax	-
Current cost profit after tax (attributable to shareholders)	-
Less : Dividends proposed	-
Current cost profit retained	-

Note : Amount of gearing adjustment is generally deducted from interest

Notes:

1. Alternatively, The gearing adjustment amount is to be deducted from the sum of current cost operating adjustments i.e. dep. adjustment, COSA and MWCA.
   a) If it is deducted the same effect will be observed. or
   b) If it is not deducted from current cost operating adjustment then it will be added in current cost profit later.
2. Gearing adjustment is considered -
   a) when a company has partly borrowings. There is no gearing adjustment made when there is fully shareholders capital.
   b) No gearing adjustment if cash balance is excess over borrowings.
   c) Hence, to determine net borrowings, cash balance is excluded from the total borrowings if any.

Illustration 13:

M/S. Atharv & Co. deals with buying and selling activities. During the three months ending 31st December 2023, following are the company transactions:

October 1. Purchase of 500 units costing Rs. 750

October 31. Sell of 400 units for Rs. 2000 and replace them with units costing Rs.1400

November 30. Sell of 200 units for Rs. 1000 and on the same day Purchase 50 units costing Rs.200

On 31st December,2023, Sell of 200 units for Rs.1100 is made and buy 100 units costing Rs.500

The retail price index during the period was as follows.

1st October 2023	100
31st October, 2023	110
30th November, 2023	115
31st December,2023	120

You are required to prepare trading accounts under the following situations:

1. Historical Cost Accounting
2. Current Purchasing Power Accounting
3. Current Cost Accounting

Solution:

Trading Account for the 3 months during 31st March, 2023

Particulars	Rs.	Rs
1. Historical Cost Accounting		
Sales:		
31st October		2000
30th November		1000
31st December		1100
		4100
Less: Cost of Sale		
31st October (750 x 4/5)	600	
30 th November (750 x 1/5 + 1400 x 1/4)	500	
31st December (1400 x 2/4)	700	1800
Gross Profit		2300
2. Current Purchasing Power Accounting Sale		
31st October (2000 x 120/110)		2182
30th November (1000 x 120/115)		1043
31st December		1100
Less: Cost of sale		4325
1st October (750 x 120/100)	900	
31st October (**1050** x 120/110)	1145	2045
Gross profit		2280

3. Current Cost Accounting		
Sale (as per Historical Cost)		4100
Less: Cost of sale		
31st October	1400	
30th November (100/50 x 200)	400	
31st December (100/100 x 500)	500	2300
Gross profit		1800

Working Note: 1400 x 3/4 = 1050

4.2.3.2 Preparation of Current Cost Balance Sheet:

Under Current Cost Accounting (CCA) method current cost balance sheet is prepared. The following table will show how assets and liabilities are valued and shown in the balance sheet on the basis of given prices/costs:

Sr.No	Assets/ Liabilities	Basis for Valuation
1	Plant and Machinery	Valued on Net Replacement Cost
2	Land & Building (self occupied)	Valued on open market price + Acquisition cost
3	Long term Investment a) Quoted on Stock Exchange b) Not quoted on Stock Exchange	 On the price ruling/quoted Current cost
4	Current Investment	At stock
5	Current Assets (exclusive of stock & WIP)	Historical cost
6	Stock	Replacement cost & net realizable cost whichever is less
7	Work in progress	Replacement cost & net realizable cost whichever is less
8	Current liabilities	Historical cost

4.2.3.3 Revaluation Surplus:

Revaluation surplus is transferred to Current Cost Reserve Account:

If there is an increase in the value of fixed assets like plant and machinery, land and building, closing stock, investment, the surplus on assets is credited to current cost reserve account.

Increase in value of fixed asset = Net Current Cost of asset at the end of the year - (less) Net historical cost of the asset.

It is noted that the historical cost and current cost are being calculated before taking depreciation into account.

Illustration 14.

A company purchased plant and Machinery for Rs. 2,40,000 having a useful life of 10 years. The replacement cost of plant & machinery is Rs. 3,60,000. Calculate the amount of revaluation surplus transferred to current cost reserve account at the 5th year.

Solution:

Revaluation Surplus on Plant & Machinery

	Net Book Value after 5 years + Depreciation for 5th year	**Net Book Value before depreciation (Rs.)**
Current Cost	Rs. 180000 + 36000	216000
Historical Cost	Rs. 120000 + 24000	144000
Net Credit to Current Cost Reserve Account	Revaluation surplus = Current Cost - Historical Cost	72000

In the fifth year, the amount to be transferred to current cost reserve account will be Rs. 72,000.

4.2.3.4 Practical Problems

Illustration 15

Following is the balance sheet of Sunil Ltd as at 31st March, 2024

Liabilities	Rs.	Assets	Rs.
Share Capital	1,60,000	Fixed Assets	1,60,000
Total	1,60,000	Total	1,60,000

1. The replacement cost of the Fixed Assets on 31st March,2024 is Rs.200000.
2. General Price index is increased by 10%
3. The Fixed Asset is sold for Rs.240000.

Find out the profit or loss on sale of Fixed Asset and prepare balance sheet according to Historical Cost method, Current Purchasing Power Method and Current Cost Accounting method.

Solution:

Statement showing Profit or loss on sale of Fixed Assets

Particulars	HCA (Rs.)	CPP (Rs)	CCA (Rs)
Sale of Fixed Assets	240000	240000	240000
Less: Cost of Fixed Asset	160000	176000	200000 (Replacement cost)
Profit on sale of fixed cost	80,000	64000	40,000

Cost CPP =160000 + 10%(160000) = 176000

Balance sheet as at 31st March, 2024

Liabilities	HCA (Rs.)	CPP (Rs)	CCA (Rs)	Assets	HCA (Rs.)	CPP (Rs)	CCA (Rs)
Share Capital	160000	176000	160000	Cash	240000	240000	240000
Profit on sale of Fixed Asset	80,000 ----	64000 -----	40,000 40000				

Revaluation Reserve							
	240000	240000	240000		240000	240000	240000

Working note:

Revaluation Reserve =Replacement Cost - Original Cost

= Rs. 200000 - Rs.160000 = Rs. 40000

Illustration 16

Following is the Profit and loss account of M/S. Nibhish & Co. for the year ended 31st March,2024 and Balance sheets as on 31st March,2023 and 31st March 2024 is given as:

Profit and Loss Statement of Rama Ltd. For year ending 31st March, 2024

Particulars	Rs.	Rs.
Sales		100000
Opening stock	30000	
Purchases	61000	
	91000	
Less- Closing Stock	40000	
Cost of goods sold		51000
Gross Profit		49000
Less: Other Expenses including 10% debentures Interest	10000	
Dep Building		
Equipment	4000	
	10000	24000
Net Profit		25000
Less: Proposed Dividend		15000
Balance c/f		10000

Balance Sheet of Rama Ltd. As on

Liabilities	31st March,2023	31st March,2024	Assets	31st March,2023	31st March,2024
Equity Share Capital	150000	150000	Land & Building Cost Rs. 160000	152000	148000
Reserves	60000	70000	Equipment Cost Rs. 100	50000	40000
Proposed Dividend	15000	15000	Stock	30000	40000
10% Debentures	Nil	20000	Debtors	13000	28000
Creditors	10000	15000	Bank	-	14000
Bank overdraft	10000				
Total	245000	270000	Total	245000	270000

Relevant price indices are:

i. Average date of building acquisition 2020	- 105
ii. 2017 Average date of Equipment acquisition and issue of equity shares	- 80
iii. 2023 Last Quarter average	- 114
iv. 2024 1:1 Debenture Issue	- 116
v. 2024 Average	- 118
vi. 2024 31st March, 2024	- 125

Closing stock of 2024 was acquired in the last quarter of 2024 and opening stock during 2023. Rama Ltd. Wishes to adjust its historical cost accounts respective current cost in line with CCA method. Assuming that the value to the business of the

assets is given by price indices above, prepare the accounts on CCA basis showing C.C. Adjustment for year ended 31st March 2024 under following heads:

a. COSA

b. Depreciation Adjustment

c. MWCA

d. Gearing Adjustment

Working Notes:

Part I Current Cost profit attributable to shareholders

i. COSA

Particulars	HC	Conversion	CC
Opening Stock	30000	30000 x 118/114	31053
Closing Stock	40000	40000 x 118/122	38689
Increase	10000	Increase	7636
COSA = HC – CC COSA = 10000 – 7636 = Rs. 2364			

ii. a) MWCA

Particulars	Opening	Closing
Debtors	13000	28000
Less: Creditors	10000	15000
MWCA	3000	13000

ii. b) MWCA Adjustment

Particulars	HC	Conversion	CC
Opening Stock	3000	3000 x 118/116	3052
Closing Stock	13000	13 000 x 118/125	12272
Increase	10000	Increase	9220
MWCA = HC - CC = 10 000 – 9220 = Rs. 780			

iii. Depreciation Adjustment

Particulars	HC	Conversion	CC
Opening Stock	4000	4000 x 118/105	4495
Closing Stock	10000	10 000x 118/80	14750
Increase	14000	Increase	19245
Depreciation Adjustment = 19245 - 14000 = 5245			

iv. Total Current Cost of Adjustment = COSA + MWCA+ Depreciation Adjustment

= 2364 + 780+ 5245 = 8389

v. Gearing Adjustment:

Particulars	Opening	Closing
Shareholders funds (Share capital + Reserves + Proposed Dividend)	225000	235000
Borrowed Funds (Debentures + BOD /Cash balance)	10000	6000
Total Funds	235000	241000
Gearing Ratio	10000/235000 = 0.04	6000/241000 = 0.02
Average Gearing Ratio	(0.04+0.02)/2 = 0.03	
Gearing Adjustment (CC op. Adjustment x Average Gearing ratio)	8389 x 0.03 = 251.67 i.e. 252 Approx.	

vi. Creation of Current Cost Revenue

Total CC op. Adjustment	8389
Less: Gearing Adjustment	252
Current Cost to be created =	8137

P & L A/c Dr ----------Rs. 8137

To Current Cost Reserve A/c -----Rs.8137

vii. Current Cost Profit transfer to B/S

Net Profit	25000
Less: Current Cost Reserve	(8137)
Proposed Dividend	(15000)
c/f to B/S	1863

PART II Balance Sheet

i. Fixed Assets

Particulars	HC	Conversion	CC
Building	148000	148000 x 125/105	176190
Equipment	40000	40000 x 125/80	62500
Increase	188000	Increase	238690
Fixed Asset Replacement Reserve to be created = 238690 - 188000 = 50690			

ii. Stock (Closing)

a. Historical Cost = 40000

b. Value to business = 40000 x 125/122 = 40984

c. Stock Replacement Reserve = 40984 - 40000 = 984

iii. Total Current Cost Reserve

Current Cost Reserve (out of profits)	8137
Add: Fixed Asset Replacement Reserve	50690
Stock Reserve	984
Total Current Cost Reserve	59811

BALANCE SHEET:

Liabilities	Amount	Assets	Amount
Share Capital	150000	Building	176190
Reserve & Surplus		Equipment	62500
a) Current Cost Reserve	59811	Stock	40984

Reserve(60000+transfer1863)	61863	Sundry Debtors	28000
Debentures	20000	Cash	14000
Creditors	15000		
Proposed Dividend	15000		
	321674		321674

Illustration 17

Following are the balance sheets and profit and loss account of Ganesh & Co

Balance Sheet as on 31st March, 2023

Liabilities	Rs	Assets	Rs
Share Capital	10,00000	Plant & Machinery	600000
Profit & Loss A/C	150000	Motor car	120000
Trade creditors	270000	Closing stock	300000
		Sundry debtors	200000
		Cash in hand	200000
	14,20,000		14,20,000

Balance Sheet as on 31st March, 2024

Liabilities	Rs	Assets		Rs
Share Capital	10,00000	Plant & Machinery	600000	540000
		Less Dep	60000	
Profit & Loss A/C	350000	Motor car	120000	108000
		Less Dep	12000	
Trade creditors	70000	Closing stock		240000
		Sundry debtors		300000
		Cash in hand		232000
	14,20,000			14,20,000

Profit & Loss Account for the year ended 31st March, 2024

Particulars	Rs	Particulars	Rs
To Opening Stock	300000	By sales	2400000
To Purchases	1740000	By Closing stock	240000
To Depreciation	72000		

To other expenses	328000		
To Net Profit c/d	200000		
	2640000		2640000

Othe Information:

1. Replacement cost on 31st March, 2024: Inventory Rs.300000, Plant & Machinery Rs.6,60,000, Motor Car Rs. 100000.
2. The replacement cost of goods sold on the dates the sale were done worth Rs. 20,00,000

Prepare Restatement of Profit & Loss for the year ended 31st March,2024 and Balance Sheet as on that date under CCA method.

Solution:

Restatement of Profit & loss for the y.e. 31st March, 2024

Particulars	Rs.	Rs.
Sales		24,00,000
Less: Cost of Goods Sold at replacement cost		(20,00,000)
		4,00,000
Less: Depreciation on Replacement Cost@10%		
Plant & Machinery on 6,60,000	66000	
Motor Car 100000	10000	
Other operation Expenses	328000	(4,04,000)
Operating Loss		(4000)
Add: Realsied Holding Gain		200000
Realised Profit		196000
Add: Unrealised Profit		100000
Total Profit		296000

Restatement of Balance Sheet as on 31st March, 2024

Liabilities	Rs	Assets	Rs
Share Capital	10,00000	Plant & Machinery 660000	594000

		Less Dep 66000	
Profit & Loss A/C Bal.on 1st April Realised profit 150000 Realsied Profit for the year 196000	346000	Motor car 100000 Less Dep 10000	90000
Trade creditors	70000	Closing stock	300000
Unrealsed holding gain (Revalation reserve)	100000	Sundry debtors	300000
		Cash in hand	232000
	15,16000		15,16,000

Working Note:

Retained Holding Gain		
COGS (replacement cost)		2000000
Less Historical Cost Op.stock Purchases Less Closing Stock	 300000 1740000 2040000 240000	 1800000
Realised Holding Gain		**200000**
2. Unrealised Holding Gain Repalcement cost 31-3-2024 Plant & Machinery Motor car Stock		 660000 100000 300000
   Less; Historical Cost on 01-04-2023 Plant & Machinery Motor car Stock	 600000 120000 240000	1060000 960000
Unrealsied Holding gain		100000

Note: Operating expenses and sales are at current cost(Market price) hence they do not arises at replacement cost.

4.3 Summary

Every business has to carry all operating and financial activities to gain. The money measurement concept is a basic attribute of accounting. Our country has a measuring unit is "Rupee" which is stable unit of value. The value of rupee changes due to the inflation. Inflation indicates the state of continuous rise in prices. It brings downward changes in the purchasing power of monetary unit. There is a need to prepare inflation adjusted financial statements. Such accounting is also known as accounting for price level changes. The IAS 29 of the International Financial Reporting Standards (IFRS) defines, hyperinflation as prices, interest, and wages linked to a price index rising 100% or more cumulatively over three years. Inflation accounting has objectives as true financial position, avoids profit overstatement, correct amount of depreciation, easy profit comparison etc likewise it has features of presents true position, inter period comparison, remove distortions, avoids mis-leading deeds etc. Inflation accounting is known as Accounting for Price level changes. The price level changes are classified into – a) General price level changes and b) Specific price level changes. As a result the following methods are generally accepted:1. Current Purchasing Power (CPP) method OR General Purchasing Power (GPP) Method based on changes in general price level changes. 2. Current Cost Accounting (CCA) method, based on changes in prices of specific assets. 3. Hybrid Method i.e. a combination/ mixture of CPP and CCA methods.

Current Purchasing Power (CPP) Method is also known as General Purchasing Power (GPP) Method of inflation accounting. CPP method seeks to restate the financial statements of the business in terms of units of equal purchasing power. It has to follow various steps under this method as Calculation of Conversion Factor, Monetary and Non-monetary Accounts, CPP method categorizes all assets and liabilities into two groups viz. a) Monetary items and B) Non-monetary items, Stock, Shareholders Funds, Gain or Loss on Monetary items, Valuation of Cost of Sales and Inventories, (5) Restated Income Statement/ Determination of Profit:

Under CPP method profit is determined by different methods a) Net Change Method and b) Conversion or Restatement of Profit/ Income Method.

Current Costing Accounting (CCA) method is an alternative method to Current Purchasing Power (CPP) method that it was introduced in 1975 to overcome the problems of CPP method. Under this method current price of each item is considered and not the historical prices of the items in financial statement. It is also called as Replacement cost. This method is used as "value to the business" as the measurement basis. The value is determined as Net current Replacement cost or Recoverable amount which is more to net realizable value of an asset. Current cost can be calculated by following three ways: Current Replacement Value , Net Realisable value and Economic or Recoverable value. Current Cost Accounting method (CCA) is very useful in the preparation of following accounts: Current Cost Profit and Loss Account and ii) Current Cost Balance Sheet. Current cost profit and loss account is determined after considering three important adjustments of depreciation adjustment, Cost of Sale Adjustment (COSA) and Monetary Working Capital Adjustment (MWCA) before interest and tax. The COSA, MWC and additional depreciation are recorded in Profit and loss account. The additional adjustment is made with the total amount of these amounts is known as Gearing adjustment. **The Current Cost Reserve consists of following important factors:** (i) Current cost adjustments viz. depreciation backlog adjustment, Cost of Sales Adjustment (COSA), Monetary Working Capital Adjustment (MWCA) and Gearing adjustment. Revaluation surplus on assets is transferred to Current Cost Reserve Account.

4.4 Terms to Remember

1. **Inflation Accounting:** It is known as accounting for price level changes.
2. **COSA-** It is Cost of Sale Adjustment needs while stock is including in cost of sale.
3. **MWCA-** It is Monetary Working Capital Adjustment required for operating activities of business.
4. **Backlog Depreciation:** Additional depreciation due to increase in prices results increase in value of asset.

4.5 Answers to Check Your Progress

Check Your Progress- 1

1. Inflation 2. purchasing power 3. current cost. 4. current price index 5. Inflation accounting 6. Accounting for Price level changes 7. monetary unit. 8. General Purchasing Power (GPP) 9. CPP 10. conversion factors, 11. fixed, 12. Purchases, 13. balance sheet, 14. equity capital

Check your Progress- 2

1. Sandilands Committee 2. Statement of Standard Accounting Practice 16 3. Replacement cost. 4. value to the business 5. Net current Replacement cost or Recoverable amount 6. Depreciation 7. Net Realisable Value 8. discounted present value. 9. Inventories 10. Backlog depreciation 11. COSA 12. Monetary Working Capital 13. Profit and loss account. 14. gearing ratio 15. current cost reserve account. 16. Current cost Reserve

4.6 Exercise

1. Explain the term inflation accounting. States its objectives and features.
2. Explain the methods of inflation accounting.
3. Explain the objectives, features, advantages and disadvantages of CPP accounting method.
4. Explain the objectives, features, advantages and disadvantages of Current Cost Accounting method.
5. Explain the following concepts under CCA method:
   a) Cost of Sale Adjustments (COSA)
   b) Monetary Working Capital Adjustment(MWCA)
   c) Depreciation Adjustment
   d) Gearing Adjustment
6. Write Short note on:
   a) Limitation of Historical Accounting
   b) Inflation and financial decision

7. A Company purchased a machine costing Rs.250000 on 1st January, 2023 when the retail price index was 200. You are required to restate the value of machine on 31st December, 2023. Assume that the price index to be at 700 on that date according to Current purchasing power.

8. On 1st January 2023, a company purchased a printing machine at a cost Rs. 12,00,000. At the same time the general price index number was 500. The market value of printing machine on 31st December, 2023 was Rs.16,00,000 and general price index number was 750.

Calculate the profit or loss on machinery under Current Purchasing Power (CPP) Method.

9. The following data are available from the books of M/s Atharv Ltd as on 31st March 2024

Particulars	1st April 2023	31st March 2024
Cash	2500	3,500
Book Debts	20,000	25,000
Creditors	12,000	20,000
Loan	35,000	35,000
Retail Price Index Number 1st April 2023 31st March, 2024 Average for the year	 220 350 290	

You are required to work out the net monetary result of the company as at 31st March 2024.

10. Following is the details of M/S. Shambhavi Industries for the given period.

Particulars	Historical Cost	Price Index
Opening Stock on 1st April, 2023	20,000	100
Purchases during the year 2023-2024	60,000	130
Closing Stock	55000	125

Index No. on 31st Marck,2024		140

Ascertain- 1) Cost of Sale 2) Closing Inventory as per CPP method under FIFO.

11. Following is the details of M/S. Manjushri & Co for the given period.

Particulars	Historical Cost	Price Index
Opening Stock on 1st April, 2024	30,000	110
Purchases during the year 2024-2025	1,40,000	125
Closing Stock	25,000	150

Ascertain- 1) Cost of Sale 2) Closing Inventory as per CPP method under LIFO.

12. Samarjit Ltd. furnishes the following income statement for the year ending 31st March, 2024 on the basis of conventional accounting. You are required to adjust the same for price level changes under CPP method.

Particulars	Amt (Rs)	Amt (Rs)
Sales		1,80,000
Less: Cost of goods sold:		
Opening Stock	15,000	
Add: Purchases	1,15,000	
Less: Closing Stock	10,000	1,40,000
		40,000
less: Expenses		
Wages & Salaries	10,000	
Other Expenses	7000	
Depreciation on Building	1000	
Interest	500	18500
Net Income		21500
Less : Dividend		1500
Retained Earnings		20000

Additional Information:

1. Index of general price level was on 1st April, 2023 as 200 and on 31st March, 2024 as 400 and Average index was 300.

2. Interest and dividend are paid at the end of the year.

3. Index was 100 while Building purchased.

13. A machine was purchased on 1st April 2023 for Rs. 5,40,000 when the price index was 100. The life of the machine was estimated to be 10 years having no scrap value. On 31st March,2024 the relevant price index was 150. Calculate amount of Depreciation Adjustment.

Calculate the Back log Depreciation from the following:

1. Current cost of an Asset Rs. 40,00,000
2. Depreciation rate 10% per year
3. Life of asset 3years
4. No scrap value is to be given.
5. Depreciation provision is made duriong the years Rs.10,40,000

14. Calculate cost of sales adjustment from the following data of M/S. Nibhish & Co.

Particulars	Rs
Opening Stock	8000
Add: Purchases	16000
	24,000
Less Closing Stock	4000
Cost of Goods sold at Historical Cost	20,000
Price level during the year:	
Opening	100
Closing	120
Average	110

15. Calculate from the data monetary working capital adjustment.

Historical Cost Balance Sheet

	January 1 (Rs)	Dec.31 (Rs)
Trade Debtors	240000	320000
Trade creditors	200000	260000
Net monetary Working capital	40000	60000

Specific price indexes of Finished goods-		
Opening	100	
Closing	120	

16. On 1st January, 2023 the amounts of share capital, debentures, long term loan and cash respectively were Rs. 5,00,000. Rs.2,60,000, Rs.90,000 and Rs.50,000. On 31st December,2023, the amounts of share capital Rs.6,00,000, debentures Rs.300,000, long term loan Rs. 110000 and cash Rs. 70,000

Adjustment for Cost of sale Rs. 60000, Adjustment for Monetary Working capital Rs.70000 and Additional depreciation Rs.12000.

Calculate the amount of Gearing Adjustment under CCA method.

17. Following is the balance sheet of Sachin Ltd as at 31st March, 2023

Liabilities	Rs.	Assets	Rs.
Share Capital	3,20,000	Fixed Assets	320,000
Total	3,20,000	Total	320,000

1. The replacement cost of the Fixed Assets on 31st March,2023 is Rs.400000.
2. General Price index is increased by 10%
3. The Fixed Asset is sold for Rs.480000.

Find out the profit or loss on sale of Fixed Asset and prepare balance sheet according to Historical Cost method, Current Purchasing Power Method and Current Cost Accounting method.

18. Following is the Profit and loss account of M/S. Manjushri & Co. for the year ended 31st March,2024 and Balance sheets as on 31st March,2023 and 31st March 2024 is given as:

Profit and Loss Statement of Rama Ltd. For year ending 31st March,2024

Particulars	Rs.	Rs
Sales		200000
Opening stock	60000	
Purchases	122000	
	182000	

Less- Closing Stock	80000	
Cost of goods sold		102000
Gross Profit		98000
Less: Other Expenses including 10% debentures	20000	
Interest	8000	
Dep Building	20000	48000
Equipment		
Net Profit		50000
Less: Proposed Dividend		30000
Balance c/f		20000

Balance Sheet of Rama Ltd. As on

Liabilities	31st March, 2023	31st March, 2024	Assets	31st March, 2023	31st March, 2024
Equity Share Capital	300000	300000	Land & Building Cost Rs. 160000	304000	296000
Reserves	120000	140000	Equipment Cost Rs. 100	100000	80000
Proposed Dividend	30000	30000	Stock	60000	80000
10% Debentures	Nil	40000	Debtors	26000	56000
Creditors	20000	30000	Bank	-	28000
Bank overdraft	20000				
Total	490000	540000	Total	490000	540000

Relevant price indices are:

i. Average date of building acquisition 2022 - 110

ii. 2019 Average date of Equipment acquisition and issue of equity - 90

shares	
iii. 2023 Last Quarter average	- 115
iv. 2024 1:1 Debenture Issue	- 117
v. 2024 Average	- 120
vi. 2024 31st March, 2024	- 125

Closing stock of 2024 was acquired in the last quarter of 2024 and opening stock during 2023. Rama Ltd. Wishes to adjust its historical cost accounts respective current cost in line with CCA method.

Assuming that the value to the business of the assets is given by price indices above, prepare the accounts on CCA basis showing C.C. Adjustment for year ended 31st March 2024 under following heads:

a. COSA

b. Depreciation Adjustment

c. MWCA

d. Gearing Adjustment

19. A company purchased plant and Machinery for Rs. 4,80,000 having a useful life of 10 years. The replacement cost of plant & machinery is Rs. 7,20,000. Calculate the amount of revaluation surplus transferred to current cost reserve account at the 5th year.

20. Following are the balance sheets and profit and loss account of Mahesh & Co

Balance Sheet as on 31st March, 2023

Liabilities	Rs	Assets	Rs
Share Capital	20,00000	Plant & Machinery	1200000
Profit & Loss A/C	300000	Motor car	240000
Trade creditors	540000	Closing stock	600000
		Sundry debtors	400000
		Cash in hand	400000
	28,40,000		28,40,000

Balance Sheet as on 31st March, 2024

Liabilities	Rs	Assets		Rs
Share Capital	20,00000	Plant & Machinery	1200000	1080000
		Less Dep	120000	
Profit & Loss A/C	700000	Motor car	240000	216000
		Less Dep	24000	
Trade creditors	140000	Closing stock		480000
		Sundry debtors		600000
		Cash in hand		464000
	2840000			2840000

Profit & Loss Account for the year ended 31st March, 2024

Particulars	Rs	Particulars	Rs
To Opening Stock	600000	By sales	4800000
To Purchases	3480000	By Closing stock	480000
To Depreciation	144000		
To other expenses	656000		
To Net Profit c/d	400000		
	5280000		5280000

Othe Information:

1. Replacement cost on 31st March,2024: Inventory Rs.600000, Plant & Machinery Rs.1320000 , Motor Car Rs. 200000.
2. The replacement cost of goods sold on the dates the sale were done worth Rs. 40,00,000

Prepare Restatement of Profit & Loss for the year ended 31st March,2024 and Balance Sheet as on that date under CCA method.

4.7 References for Further Study :

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