UNIT II

STANDARD COSTING

Standard Cost – Meaning

Standard Cost is a predetermined cost. It is calculated in advance to manufacture a single unit or a number of units of a product during a future period. The aim of standard cost is to eliminate the changes in prices. It is used as a guide for decision making.

A standard cost has been described as a predetermined cost, an estimated future cost, an expected cost, a budgeted unit cost, a forecast cost, or a "should be" cost. Standard costs are often a part of a manufacturer's annual profit plan and operating budgets. Standard costs will be established for the following year's direct materials, direct labor, and manufacturing overhead.

If standard costs are used, there will be:

- a standard cost for each unit of input
- a standard quantity of each input for each unit of output
- a standard cost for each unit of output

Definition

According to Chartered Institute of Management Accountants (CIMA), “A predetermined cost, which is calculated from management’s standards of efficient operation and the relevant necessary expenditure”.

“An estimated or predetermined cost of performing an operation or producing a good or service under normal conditions”.

Standard Costing – Meaning

Standard Costing is a technique of using standard cost for the purpose of cost control. It is an effective tool for planning, coordinating, controlling and decision making. The object of standard costing is to ascertain the quotation and determination of price policy.

Standard Costing is a method of ascertaining the costs whereby statistics are prepared to show (a) standard cost (b) the actual cost (c) the difference between these costs, which is termed the variance.

Standard costing is the practice of substituting an expected cost for an actual cost in the accounting records, and then periodically recording variances showing the difference between the expected and actual costs. This approach represents a simplified alternative to cost layering systems, such as the FIFO and LIFO methods, where large amounts of historical cost information must be maintained for items held in stock.

Standard costing involves the creation of estimated (i.e., standard) costs for some or all activities within a company. The core reason for using standard costs is that there are a number of applications where it is too time-consuming to collect actual costs, so standard costs are used as a close approximation to actual costs.

Definition:

According to ICMA Standard Costing is defined as, "The preparation and use of standard costs, their comparison with actual costs and the analysis of variances to their causes and points of incidence".

Standard costing is a method of ascertaining the costs whereby statistics are prepared to show:

i. The standard cost

ii. The actual cost

iii. The difference between these costs, which is termed the variance.

Thus the technique of standard cost study comprises of:

Pre-determination of standard costs

Use of standard costs

Comparison of actual cost with the standard costs

Find out and analyse reasons for variances

Reporting to management for proper action to maximize efficiency

Advantages of Standard Costing

1. Cost Control: Standard costing is universally recognised as a powerful cost control system. Controlling and reducing costs becomes a systematic practice under standard costing.

2. Elimination of Wastage and Inefficiency: Wastage and inefficiency in all aspects of the manufacturing process are curtailed, reduced and eliminated over a period of time if standard costing is in continuous operation.

3. Norms: Standard costing provides the norms and yard sticks with which the actual performance can be measured and assessed.

4. Locates Sources of Inefficiency: It pin points the areas where operational inefficiency exists. It also measures the extent of the inefficiency.

5. Fixing Responsibility: Variance analysis can determine the persons responsible for each variance. Shifting or evading responsibility is not easy under this system.

6. Management by Exception: The principle of 'management by exception can be easily followed because problem areas are highlighted by negative variances.

7. Improvement in Methods and Operations: Standards are set on the basis of systematic study of the methods and operations. As a consequence, cost reduction is possible through improved methods and operations.

8. Guidance for Production and Pricing Policies: Standards are valuable guides to the management in the formulation of pricing policies and production decisions.

9. Planning and Budgeting: Budgetary control is far more effective in conjunction with standard costing. Being predetermined costs on scientific basis, standard costs are also useful in planning the operations.

10. Inventory Valuation: Valuation of stocks becomes a simple process by valuing them at standard cost.

Limitations of Standard Costing

1. Variation in Price: One of the chief problems faced in the operation of the standard costing system is the precise estimation of likely prices or rate to be paid.

2. Varying Levels of Output: If the standard level of output set for pre-determination of standard costs is not achieved, the standard costs are said to be not realised.

3. Changing Standard of Technology: In case of industries that have frequent technological changes affecting the conditions of production, standard costing may not be suitable.

4. Applicability: It cannot be used in those organizations where non-standard products are produced. If the production is undertaken according to the customer specifications, then each job will involve different amount of expenditures.

5. Difficult to set Standard: The process of setting standard is a difficult task, as it requires technical skills. The time and motion study is required to be undertaken for this purpose. These studies require a lot of time and money.

6. Problem in fixing Responsibility: The fixing of responsibility is not an easy task. The variances are to be classified into controllable and uncontrollable variances. Standard costing is applicable only for controllable variances.

Purposes of Standard Costs:

Standard costs are very useful for managerial control and planning. They provide a yardstick for the measurement of operational efficiency of an enterprise. Standard Costs are used for:

- Establishing budgets
- Controlling costs, motivating employees, and measuring efficiency.
- Promoting possible cost reduction.
- Simplifying costing procedures and expediting cost reports.
- Assigning/allocating costs to materials, work-in-progress and finished goods inventories.
- Forming the basis for establishing bids and contracts as well as for setting selling prices.

Distinguish between Standard Cost and Estimated Cost

S.No.	**Standard Cost**	**Estimated Cost**
1	It is a regular system of account entered in the books of accounts.	It is statistical information and not entered in the books of accounts.
2	It finds out what the cost should be?	It finds out what the cost will be?
3	It is used for cost control to maximize efficiency.	It is used to ascertain the fixation of selling price.
4	It takes into accounts all the manufacturing processes.	It is used for specific purpose like fixing sale price.
5	.It is used by the firms where standard costing system followed.	It is used by the firms where historical costing system adopted.
6	It is an accurate based on the scientific analysis.	It is an approximate based on past experience.

Distinguish between Standard Cost and Budgetary Control

Both Standard and Budgetary Control are complimentary to each other and should be used simultaneously. But they differ in scope and techniques. They are:

S.No	**Standard Costing**	**Budgetary Control**
1	It is intensive because it is related with control of expenses.	It is extensive because it is related with control of whole business.
2	It is a part of cost accounts	It is a part of financial accounts.
3	It is based on technical assessment.	It is based on past performance to future trend.
4	Variances are revealed through accounts.	Variances are not revealed through accounts.
5	It cannot be applied in parts	It can be applied in parts.

6	.It is expensive.	It is less expensive.
7	It cannot be operated without budgets.	It can be operated without standards.

Setting of Standards

A standard is an ideal which is anticipated and can be attained over a future period of time, normally in the next accounting year. The cost accountant, departmental heads, foremen and technical experts should work together in setting standards. Just like a budget committee, a committee should be formed to set standards.

TYPES OF STANDARDS

Broadly the standards can be divided into three categories:

(i) Current standards;
(ii) Basic standard; and
(iii) Normal standard

(i) Current Standards

Fixed on the basis of current conditions and remain in operation for a limited period in the sense that they are revised at regular intervals. Current standards are of two types:

(a) **Ideal standards**:

This standard reflects the level of attainment on the basis of maximum possible level of efficiency which may never be achieved.

(b) **Expected (or Attainable) standards**.

Reflects a level of attainment based on a high level of efficiency which is capable of being achieved. It is best suited for control point of view because this standard reveals real variances from the attainable performance levels.

(ii) Basic Standard

The standard is established and operated without revision for a number of years to help forward planning. It is not suitable for cost control purposes.

(iii) Normal Standard

This standard is meant to smooth out fluctuations caused by seasonal and cyclical changes. It is difficult to follow such standards in practice because it is not possible to forecast performance with adequate accuracy for a long period of time. As such, normal standards have little relevance *for planning* and *cost control*.

Preliminaries for Establishing Standard Costing System

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

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

2. Classification of Accounts: Classification of accounts is necessary to meet a required purpose i.e., function, asset or revenue item. Codes can be used to have a speedy collection of accounts. A standard is a predetermined measure of material, labour and overheads. It may be expressed in quantity and its monetary measurements in standard costs.

3. Types of Standards: The standards are classified into three categories:

(i) Current Standard: A current standard is a standard which is established for use over a short period of time and is related to current condition. It reflects the performance which should be accomplished during the current period. The period for current standard is normally one year. It is supposed that the conditions of production will remain unchanged. In case there is any change in price or manufacturing condition, the standards are also revised. Current standard may be ideal standard and expected standard.

(a) Ideal Standard: The standard represents a high level of efficiency. It is fixed on the assumption that favourable conditions will prevail and management will be at its best. The price

paid for materials will be lowest and wastages cost of labour and overhead expenses will be minimum possible.

(b) Expected Standard: This standard is based on expected conditions. It is the target which can be achieved if expected conditions prevail. All existing facilities and expected changes are taken into consideration while fixing these standards. An allowance is given for human error and normal deficiencies. It is realistic and an attainable and it is used for fixing efficiency standard.

(ii) Basic Standard: A basic standard is established for use for an indefinite period or a long period. These standards are revised only on the changes in specification of material and technology production.

(iii) Normal Standard: Normal standard is a standard which is anticipated can be attained over a future period of time, preferably long enough to cover one trade cycle. This standard is based on the conditions which will cover a future period, say 5 years, concerning one trade cycle. If a normal cycle of ups and downs in sales and production is 10 years then standard will be set on average sales and production which will cover all the years.

4. Organisation for Standard Costing: In a business concern a standard costing committee is formed for the purpose of setting standards. The committee includes production manager, purchase manager, sales manager, personnel manager, chief engineer and cost accountant. The Cost Accountant acts as a coordinator of this committee. He supplies all information for determining the standard and later on coordinates the costs of different departments. He also informs the committee about the change in price level, etc. The committee may revise the standards in the light of the changed circumstances.

5. Setting of Standards: The standard for direct material, direct labour and overhead expenses are fixed. The standards for direct material, direct labour and overheads should be set up in a systematic way so that they can be used as a tool for cost control easily.

VARIANCE ANALYSIS

The term variance is derived from the word 'To vary' means differ. In cot account variance means the difference between the standard cost and actual cost. When actual cost is less than standard cost, it is known as Favourable (F) variance. When actual cost is more than standard cost, it is known as Unfavourable (A) variance. It indicates whether costs are under control or not, to the management.

Variance analysis is the quantitative investigation of the difference between actual and planned behavior. This analysis is used to maintain control over a business.

Variance analysis typically involves the isolation of different causes for the variation in income and expenses over a given period from the budgeted standards.

For example, if direct wages had been budgeted to cost Rs.100,000 actually cost Rs.200,000 during a period, variance analysis shall aim to identify how much of the increase in direct wages is attributable to:

- Increase in the wage rate (adverse labor rate variance);
- Decline in the productivity of workforce (adverse labor efficiency variance);
- Unanticipated idle time (labor idle time variance);
- More wages incurred due to higher production than the budget (favorable sales volume variance).

Definition

According CIMA London, "Variance is difference between the standard cost and the comparable actual cost incurred during a period".

According ICMA, "Variance Analysis is the resolution into constituent parts and explanation of variances".

According to S.P.Gupta, "Variance Analysis is the measurement of variances, location of their root causes, measuring their effect and their disposition".

Variance Analysis, in managerial accounting, refers to the investigation of deviations in financial performance from the standards defined in organizational budgets.

Interpretation of Variances

Each variance is interpreted accordingly and by "*interpretation*" we mean making a decision whether the variance is favourably or unfavorable and attaching responsibility.

- When actual cost is less than the standard cost, the difference is considered "**Favourable"** or **Credit Variance**. On the other hand when the actual cost exceeds the standard cost, the difference is termed as **Unfavourable** or A **Debit Variance**. Ordinarily, a Favourable Variance is a sign of efficiency of the organisation whereas an Unfavourable Variance is a sign of inefficiency.

Controllable Vs. Uncontrollable Variances

- A variance is controllable if it can be identified as a primary responsibility of a specified person or of a department. If the variance is caused by factors beyond the control of the concerned person (or department), it is said to be uncontrollable. It is the controllable variance that attracts the attention of the management because it is here that corrective action is required.

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CLASSIFICATION OF VARIANCES

- Variances may broadly be classified into two groups:

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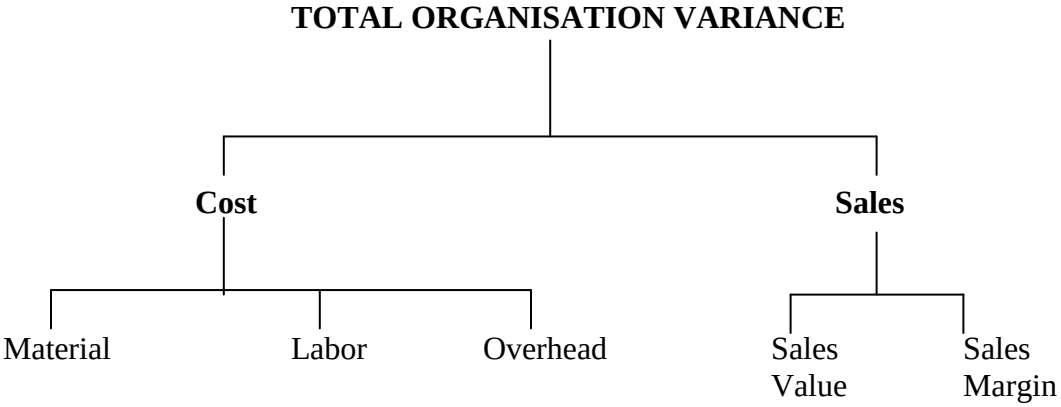
(i) **Cost Variances**, and
(ii) Sales Variances.



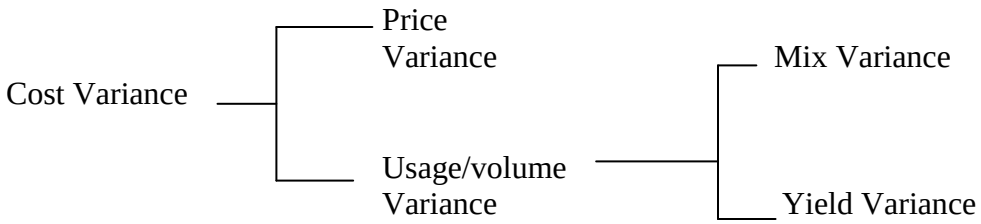
COST VARIANCES

In the manufacturing function, cost variances are classified on the basis of the elements of cost viz. material, labor and expense variances.
In cost analysis the standard cost of each element of cost is reconciled with actual cost and difference is called cost variance or total variance. The cost variance has two components:

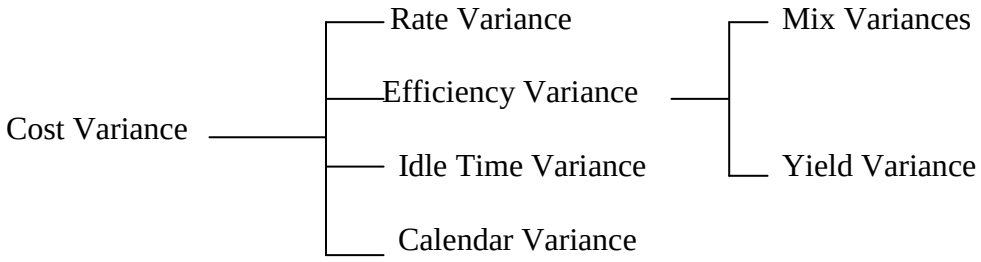
(i) Price Variance and
(ii) Volume variance.

Classification of Cost Variances

(i) **Material Variance:**

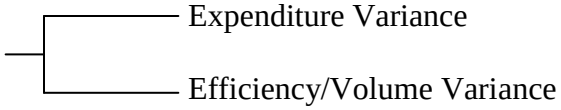


(ii) **Labour Variances:**

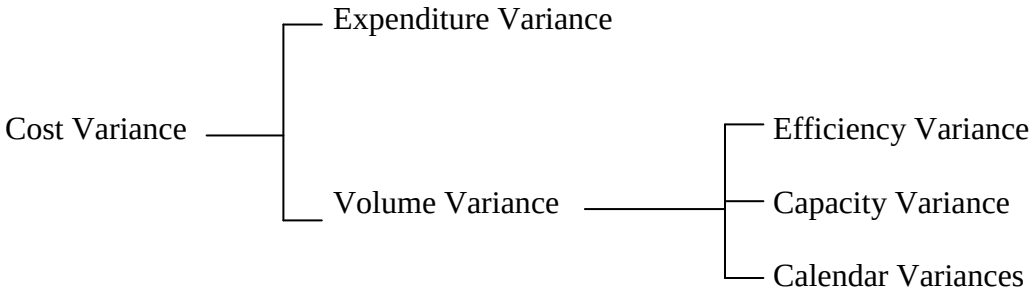


(iii) **Overhead Variances**

A: Variable Overhead Variance



B: **Fixed Overhead Variance**



ANALYSIS OF VARIANCES

The divergence between standard costs, profits or sales and actual costs, profits or sales respectively will be known as variances. The variances may be favourable and unfavourable. If actual cost is less than the standard cost and actual profit and sales are more than the standard profits and sales, the variances will be favourable. On the contrary if actual cost is more than the standard cost and actual profit and sales are less than the standard profits and sales, the variances will be unfavourable.

The variances are related to efficiency. If variances are favourable, it will show efficiency and if variances are unfavourable it will show inefficiency. The variances may be classified into four categories such as Direct Materials Variances, Direct Labour Variances, Overheads Cost Variances and Sales or Profit Variances.

1. DIRECT MATERIAL VARIANCES

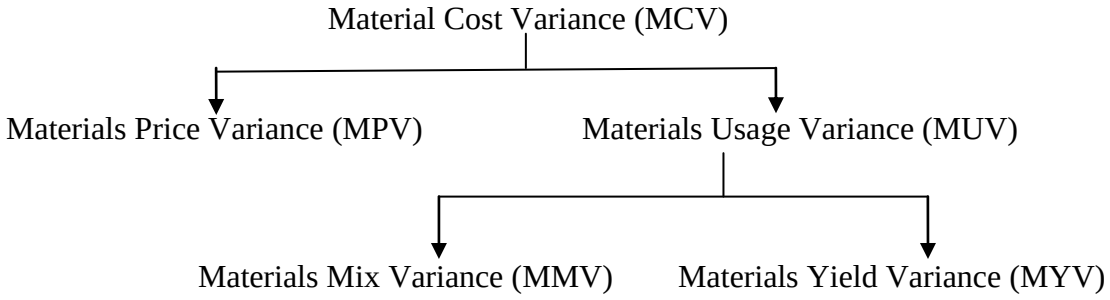
Direct material variances are also known as material cost variances. The material cost variance is the difference between the standard cost of materials that should have been incurred for manufacturing the actual output and the cost of materials that has been actually incurred. Material Cost Variance comprises of:

(i) Material Price Variance and

(ii) Material Usage Variance: Material usage variance may further be subdivided into material Mix Variance and Material Yield Variance.

The Chart depicts the divisions and subdivisions of material variances.

Chart



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

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

(ii) MUV=MMV+MYV

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

Materials Cost Variance = Standard Material Cost – Actual Material Cost

Standard Material Cost = Standard Price per unit x Standard Quantity of materials

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

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

(b) Materials Price Variance: Materials price variance arises due to the standard price specified and actual price paid. It may also arise due to: (i) Changes in basic prices of materials, (ii) failure to purchase the quantities anticipated at the time when standards were set, (iii) failure to secure discount on purchases, (iv) failure to make bulk purchases and incurring more on freight, etc., (v) failure to purchase materials at proper time, and (vi) Not taking cash discount when setting standards.

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

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

(c) Material Usage Variance: Material usage (or quantity) variance arises due to the difference in standard quantity specified and actual quantity of materials used. This variance may also arise due to: (i) Negligence in use of materials, (ii) More wastage of materials by

untrained workers or defective methods of production, (iii) Loss due to pilferage, (iv) Use of material mix other than the standard mix, (v) More or less yield from materials than the standard set, and (vi) Defective production necessitating the use of additional materials.

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

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

Illustration 1: Following is the data of a manufacturing concern. From the figures given below, calculate (i) Materials Cost Variance, (ii) Material Price Variance, and (iii) Material Usage Variance. The standard quantity of materials required for producing one ton of output is 40 units. The standard price per unit of materials is Rs.3. During a particular period 90 tons of output was undertaken. The materials required for actual production were 4,000 units. An amount of Rs. 14,000 was spent on purchasing the materials.

Solution:

Standard quantity of material (SQ) = (90 x 40) = 3600 units
Standard price per unit = Rs. 3
Actual price per unit = 14000/4000 = Rs. 3.50

(i) Material Cost Variance = Standard material cost – Actual material cost
Standard material cost = Standard quantity x Standard price
3,600 x 3 = Rs. 10,800
= 10,800 – 14,000
= (–) Rs. 3,200 Adverse

(ii) Material Price Variance = Actual Quantity (Standard Price Per Unit – Actual Price Per Unit)
= 4,000 (3.00 – 3.50)
= 4,000 (–0.50)
= (–) Rs. 2,000 Adverse

(iii) Material Usage Variance = Standard Price per unit (SQ – AQ)
. = 3 (3,600 – 4,000)
= 3 (–400) = (–) Rs. 1,200 Adverse

Verification: MCV = MPV + MUV
– 3,200 = – 2,000 – 1,200
– 3,200 = – 3,200

Illustration 2 : From the data given below, calculate: (i) Material Cost Variance, (ii) Material Price Variance, and (iii) Material Usage Variance.

Product	Standard		Actual	
	Quantity (Units)	Price Rs.	Quantity (Units)	Price Rs.
A	1050	2.00	1100	2.25
B	1500	3.25	1400	3.50
C	2100	3.50	2000	3.75

Solution:

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

Or (SQ x Std. Rate) – (AQ. x Actual Rate)

Material A = (1,050 x 2) – (1,100 x 2.25)

2,100–2,475 = – Rs. 375

Material B = (1,500 x 3.25) – (1,400 x 3.50)

4,875–4,900= – Rs. 25

Material C = (2,100 x 3.50) – (2000 x 3.75)

7,350–7,500 = – Rs. 150

Material Cost Variance = Rs. 550 Unfavourable

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

Material A = 1,100 (2.00 – 2.25)

= 1,100 (–0.25) = Rs. 275

Material B = 1,400 (3.25 – 3.50)

= 1,400 (–0.25) = – Rs. 350

Material C = 2,000 (3.50 – 3.75)

=2,000 (–0.25) = – Rs. 500

Material Price Variance = Rs. 1,125 Unfavourable

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

Material A = 2 (1.050 – 1,100)

= 2 (–50) = Rs. 100

Material B = 3.25 (1,500–1,400)

= 3.25 (100) = Rs. 325

Material C = 3.50 (2,100 – 2,000)

= 3.50 (100) = Rs. 350

Material Usage Variance = Rs. 575 Favourable

Verification: MCV = MPV + MUV
– Rs.550= – Rs. l125 + Rs. 575
– Rs. 550 = – Rs. 550

(d) Material Mix Variance: Materials mix variance is that part of material usage variance which arises due to changes in standard and actual composition of mix. Materials mix variance is the difference between standard price of standard mix and standard price of actual mix. The standard price is used in calculating this variance.

The variance is calculated under two situations: (i) When actual weight of mix is equal to standard weight of mix, and (ii) When actual weight of mix is different from the standard mix.

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

In this case the formula for calculating mix variance is :

Standard Cost of Standard Mix – Standard Cost of Actual Mix.

(Standard Price X Standard Quantity) – (Standard Price X Actual Quantity)

Or Standard Unit Cost (Standard Quantity – Actual Quantity)

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

Illustration 3: Calculate material mix variance from the data given as such:

	Standard		Actual	
Materials	Quantity (Units)	Price Rs.	Quantity (Units)	Price Rs.
A	50	2.00	60	2.25
B	100	1.20	90	1.75

Due to the shortage of material A, the use of material A was reduced by 10% and that of material B increased by 5%.

Solution:

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

Material A = 50 – 5 (50 x 10/100) = 45

Material B = 100 + 5 (100 x 5/100) = 105

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

Material A = 2 (45 – 60)
= 2 (– 15) = – Rs. 30

Material B = 1.20 (105 – 90)
= 1.20(15) = Rs. 18

Material Mix Variance= – Rs. 12 Unfavourable

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

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

$$\left\{\frac{\text{Total Weight of Actual mix}}{\text{Total Weight of Standard mix}} \text{ X Standard Cost of Standard}–\text{(Standard Cost of Actual Mix)}\right\}$$

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

$$\left\{\frac{\text{Total Weight of Actual mix}}{\text{Total Weight of Revised Std mix}} \text{ X Standard Cost of Revised Standard Mix} – \text{(Standard Cost of Actual Mix)}\right\}$$

Illustration 4: From the following data calculate various material variances:

	Standard		Actual	
Materials	Quantity (Units)	Price Rs.	Quantity (Units)	Price Rs.
A	80	8.00	90	7.50
B	70	3.00	80	4.00

Solution:

(a) Material Cost Variance = Standard Material Cost– Actual Material Cost

Standard Material Cost = (Standard Qty. x Standard Price)

Actual Material Cost = (Actual Qty. x Actual Price)

= (Standard Qty. x Standard Price) – (Actual Qty. x Actual Price)

Material A = (80 X 8) – (90 X 7.50)
= 640–675 = – Rs. 35

Material B = (70 X 3) – (80 X 4.00)
=210–320 = – Rs. 110

Material Cost Variance = Rs. 145 Unfavourable

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

Material A = 90 (8.00 – 7.50)
= 90 (0.50) = + Rs. 45

Material B = 80 (3.00 – 4.00)
= 80 (–1.00) = – Rs. 80

Material Price Variance = Rs. 35 Unfavourable

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

Material A = 8 (80 – 90)
= 8 (–10) = – Rs. 80

Material B = 3 (70 – 80)
= 3 (–10) = – Rs. 30

Material Usage Variance = Rs. 110 Unfavourable

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

$$\left\{\frac{\text{Total Weight of Actual mix}}{\text{Total Weight of Standard mix}} \text{ X Standard Cost of Standard Mix)}\right\}$$

$$\frac{170}{150}\text{X ((80 x 8) +(70 x 3)) - ((90 x 8) +(80 x 3))}$$

$$\frac{170}{150}\text{X (640 + 210) – (720 + 240)}$$

$$\frac{170}{150}\text{X 850 – 960} \qquad = 963.3 – 960 = \text{Rs.3.3 Favourable}$$

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

Material Yield Variance is calculated with the following formula:

Standard Rate (Actual yield – Standard yield)

Standard Rate is calculated as follows:

$$\text{Standard Rate} = \frac{\text{Standard Cost of Standard Mix}}{\text{Net Standard Output i.e., Gross Output – Standard Loss}}$$

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

$$\text{Standard Rate} = \frac{\text{Standard Cost of Revised Standard Mix}}{\text{Net Standard Output}}$$

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

Illustration 5: The standard mix of a product is as under:

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

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

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

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

Solution:

(i) Material Cost Variance:

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

Standard cost for 100 Units = 50 x 10 = Rs. 500

Actual yield is 90 units, so standard cost will be adjusted accordingly.

Standard cost for actual yield = 100 X 90 = Rs. 450

Material Cost Variance = Standard Cost – Actual Cost
= 450 – 524 = Rs. 74 unfavourable

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

Material A = 640 (0.15 – 0.20)
= 640 (–0.05) = Rs. 32 unfavourable

Material B = 960 (0.20 – 0.15)
= 960 (0.05) = Rs. 48 favourable

Material C = 840 (0.25 – 0.30)
= 840 (–0.05) = Rs. 42 unfavourable

Material price Variance (A + B + C) = Rs. 26 unfavourable

(iii) Material Usage Variance:

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

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

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

$$C \quad \frac{1000}{100} \times 90 = 900$$

Standard Price (Standard Quantity – Actual Quantity)

Material A = 15 P. (540 – 640)
= 15 (– 100) = Rs. 5 unfavourable

Material B = 20 P. (720 – 960)
= 20 (– 240) = Rs. 48 unfavourable

Material C = 25 P. (900 – 840)
= 25 (60) = Rs. 15 favourable

Material usage Variance = Rs. 48 unfavourable.

(iv) Material Mix Variance

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

Standard Price (Standard Quantity – Actual Quantity)

$$A \quad \frac{60}{240} \times 2440 = 610$$

$$B \quad \frac{80}{240} \times 2440 = 813 \text{ (approximately)}$$

$$C \quad \frac{100}{240} \times 2440 = 1017 \text{ (approximately)}$$

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

Material A = 15 P. (610 – 640)
= 0.15 (–30) = Rs. 4.50 unfavourable

Material B = 20 P. (813 – 960)
= 0.20 (–147) = Rs. 29.40 unfavourable

Material C = 25 P. (1017 –840)
= 0.25 (177) = Rs. 44.25 favourable

Material Mix Variance = Rs. 10.35 favourable

(V) Material Yield Variance= Standard Rate (Actual Yield – Standard–Yield)

$$\text{Standard Rate`} = \frac{\text{Standard Cost of Revised Standard Mix}}{\text{Net Standard Output}}$$

= 50/10 = Rs. 5

Standard Yield =10/240 x 2440 = 101.67 units

Yield Variance = 5 (90 – 101.67) = Rs. 58.35 unfavourable.

Verification: (i) MCV=MPV+MUV or –74 = 26–48 = –74
(ii) MUV = MMV+MYV or –48 = 10.35 – 58.35 = – 48

Illustration 6: KSS Ltd. produces an article by blending two basic raw materials. It operates a standard costing system and the following standards have been set for raw materials:

Materials	Standard Mix	Standard Price per Kg.
A	40%	4.00
B	60%	3.00

The standard loss in processing is 15%. During April, 1996, the company produced, 1,700 kg. of finished output.

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

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

Calculate the following variances:

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

Solution:

Calculation of Standard Cost of Standard Mix

Material	Std.Qty. of Material Required	Standard Price Per Kg.	Standard Cost
A	800	4.00	3200
B	1200	3.00	3600
Total	2000		6800

Standard Cost:

The standard loss is 15% ; so to get 85 finished kgs. 100 kgs. of material are required.

Actual finished product is 1,700 kgs; so standard material required will be

$$\frac{1700}{85} \times 100 = 2000 \text{ Kgs.}$$

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

Calculation of Actual Cost of Material used

Material A :

Opening Stock :	35 kgs @ Rs. 4 (standard rate)	Rs. 40.00
Out of Purchases :	795 kgs @ Rs. 4.25 (actual rate)	Rs. 3378.75
(Purchases – Closing Stock)		Rs. 3518.75

Material B :

Opening Stock :	40 kgs @ Rs. 3 (standard rate)	Rs. 120.00
Out of Purchases :	1,150 kgs @ 2.50 (actual rate)	Rs 2,875.00
(Purchase – Closing Stock)		Rs. 6513.75

Actual Rate:

Material A	Rs.3400 / 800 Kgs	= Rs. 4.25
Material B	Rs.3000 / 1200 Kgs	= Rs. 2.50

(i) Material Price Variance:

Material A = (830 kg x 4) – (35 kgs x 4 + 795 kgs x 4.25)
= Rs. 3,320 – Rs. 3,518.75
= Rs. 198.75 Adverse.

Material B = (1,190 kgs x 3) – (40 kgs x 3 + 1,150 kgs x 2.50)
= Rs. 3,570 – Rs. 2,995
= Rs. 575 (Favourable)

Total Material Price Variance = – 198.75 + 575 = Rs. 376.25 Favourable.

(ii) Material Usage Variance:

Standard Price (Standard Usage–Actual Usage)

Material A :	Rs. 4 (800 kgs – 830 kgs)	= Rs. 120 Adverse
Material B :	Rs. 3 (l, 200 kgs – 1,190 kgs)	= Rs. 30 Favourable

Total Material Usage Variance = –120 + 30 = 90 Adverse

(iii) Material Yield Variance

Standard Rate (Actual yield – Standard Yield)

= Rs. 4 (1.700 kgs –1,717 kgs)

= Rs. 68 Adverse

Standard Rate = $\frac{\text{Rs.6800}}{\text{1700 Kgs}}$ = Rs. 4.00

Standard Yield = $\frac{1700}{2000}$ x 2,020 = 1,717 kgs.

(iv) Material Mix Variance:

Mix) $\left[\frac{\text{Total Weight of Actual Mix}}{\text{Total Weight of Std. Mix}} \text{ X Std.Rate}\right]$ – (Standard Cost of Actual

$\left\{\frac{2020}{2000} \text{ x Rs. } 6{,}800\right\}$ – (830 kgs x 4 + 1,190 kgs x 4)

= Rs. 6868 – Rs. 6,890

= Rs. 22 Adverse

(v) Total Material Cost Variance

Standard Cost of Materials – Actual Cost of Materials

Rs. 6,800 – Rs. 6,513.75 = Rs. 286.25 Favourable.

2. DIRECT LABOUR VARIANCES

Labour Variances are discussed as follows:

(a) Labour Cost Variance

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

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

(b) Labour Rate of Pay or Wage Rate Variance

It is that part of labour cost variance which arises due to a change in specified wage rate. Labour rate variance arises due to (i) change in basic wage rate or piece-work rate, (ii) employing

persons of different grades then specified, (iii) payment of more overtime than fixed earlier, (iv) new workers being paid different rates than the standard rates, and (v) different rates being paid to workers employed for seasonal work or excessive work load.

The wage rates are determined by demand and supply conditions of labour conditions in labour market, wage board awards, etc. So, wage rate variance is generally uncontrollable except if it arises due to the development of wrong grade of labour for which production foreman will be responsible. This variance is calculated by the formula:

Labour Rate of Pay Variance = Actual time (Standard Rate – Actual Rate)

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

(c) Labour Efficiency or Labour Time Variance

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

Labour efficiency variance is calculated as:

Labour efficiency variance = Standard Wage Rate (Standard Time–Actual Time).

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

(d) Idle Time Variance

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

Idle Time Variance - Idle Hours x Standard Rate

(e) Labour Mix or Gang Composition Variance

This variance arises due to change in the actual gang composition than the standard gang composition. This variance shows to the management how much labour cost variance is due to the change in labour composition. It may be calculated in two ways:

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

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

Due to the non-availability of one grade of labour, there may be a change in standard labour mix, and then revised standard will be used for standard mix. The formula will be:

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

(ii) When **standard and actual time of labour mix are different:**
In this case the variance will be calculated as follows:

$$\left\{ \left\{ \frac{\text{Total Time of Actual Labour Mix}}{\text{Total Time of Standard Labour Mix}} \times \text{Std.Cost of Revised Labour Mix} \right\} - (\text{Standard Cost of Actual Labour Mix}) \right\}$$

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

$$\left[\left\{\frac{\text{Total Time of Actual Labour Mix}}{\text{Total Time of Revised Std Labour Mix}} \times \text{Std.Cost of Revised Std. Labour Mix} - \text{Std. Cost of Actual Labour Mix}\right\}\right]$$

Illustration: 7. The information regarding the composition and the weekly wage rates of labour force engaged on a job scheduled to be completed in 30 weeks:

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

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

Solution:

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

Standard Labour Cost : Rs.

Skilled : 75 x 60 x 30 = 1, 35,000
Semi–skilled : 45 x 40 x 30 = 54,000
Unskilled : 60 x 30 x 30 = 54,000
Total = 2, 43,000

Actual Labour Cost:

Skilled : 70 x70 x 32 = 1,56,800
Semi Skilled : 30 x 50 x 32 = 48,200
Unskilled : 80 x 20 X 32 = 51.000
Total = 2,56,000

Total Labour Cost Variance: 2,43,000 – 2,56,000 = Rs. 13,000 Adverse

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

Skilled : 2,240 (60 – 70)
2,240 (– 10) = Rs. 22,400 Adverse

Semi Skilled : 960 (40 – 50)
960 (–10) = Rs. 9,600 Adverse
Unskilled : 2,560 (30 – 20)
2,560 (10) = Rs. 25,600 Favourable
Labour Rate Variance =Rs. 6,400 Adverse

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

Skilled : 60(2,250 – 2,240)
60(10) = Rs. 600 Favourable

Semi Skilled : 40(1,350-960)
40(390) = Rs. 15,600 Favourable

Unskilled : 30(1,800 – 2,560)
30 ((-760) =Rs. 22,800 Adverse.

Labour Efficiency Variance =Rs. 6,600 Adverse

Verification:

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

Illustration 8. The following data is taken out from the books of a manufacturing company:

Budgeted labour composition for producing 100 articles
20 Men @ Rs. 125 per hour for 25 hours
30 women @ 1.10 per hour for 30 hours
Actual labour composition for producing 100 articles
25 Men @ Rs. 1.50 per hour for 24 hours
25 Women @ Re.l.20 per hour for 25 hours

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

Solution:

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

Men : = (20 x 25 x 1.25) – (25 x 24 x 1.50)
625 – 900 = Rs.275 Adverse

Women: = (30 x 30 x 1.10) – (25 x 25 x 1.20)
990 – 750 = Rs. 240 Favourable

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

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

Men : = 600 (1.25 –1.50)
= 600 (–0.25) = Rs. 150.00 Adverse

Women : = 625 (1.10– 1.20)
= 625 (–0.10)= Rs. 62.50 Adverse

Labour Rate Variance = Rs. 212.50 Adverse.

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

Men : = 1.25 (500 – 600)
= 1.25 (– 100) = Rs. 125 Adverse

Women : = 1.10(900-625)
= 1.10 (275) = Rs. 302.50 Favourable

Labour Efficiency Variance = Rs. 177.50 Favourable

(iii) **Labour Mix Variance**:

Standard time for Men and Women = 1,400 hours
Actual time for Men and Women = 1,225 hours

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

$$\left\{ \frac{\text{Total Time of Actual Labour Mix}}{\text{Std.Time of Revised Std Labour Mix}} \times \text{Std.Cost of Revised Std. Labour Mix} - \text{Std. Cost of Actual Labour Mix} \right\}$$

1225/1440 x (20 x 25 x 1.25) + (30 x 30 x 1.10) – (25 x 24 x 1.25) + (25 x 25 x 1.10)
1413.12- 1437.50 = Rs. 24.38 Adverse.

3. OVERHEAD VARIANCES

Overhead is the aggregate of indirect material cost, indirect wages (indirect labour cost) and indirect expenses. Thus, overhead costs are indirect costs and are important for the management for the purposes of cost control. Under cost accounting, overhead costs are absorbed by cost units on some suitable basis. Under standard costing, overhead rates are predetermined in terms of either labour hours (per hour) or production units (per unit of output). The formula for the calculation of overhead cost variance is given below:

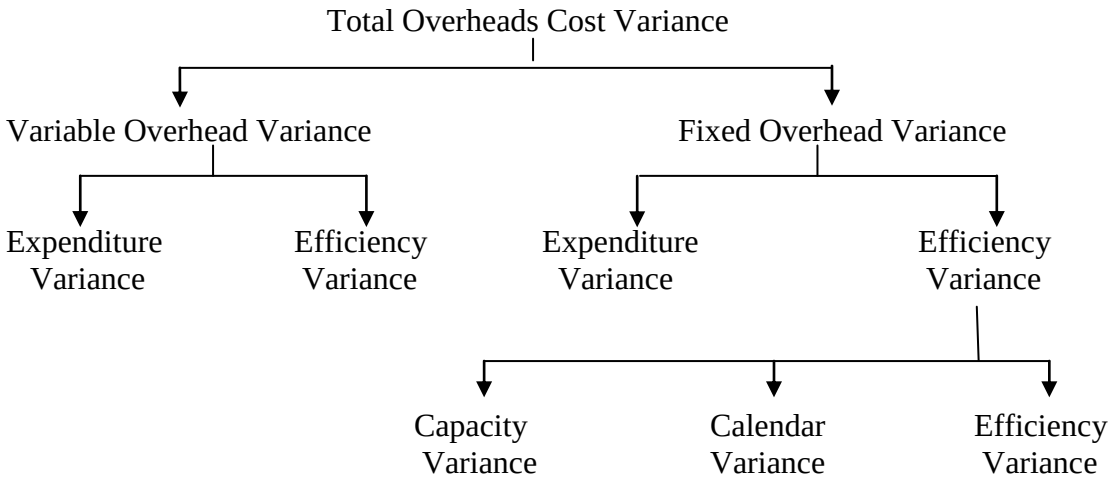
Overhead Cost Variance = Actual Output x Standard Overhead Rate per unit Actual Overhead Cost

Or

= Standard Hours for Actual Output x Standard Overhead Rate per hour Actual Overhead Cost

An analytical study of the behaviour of overheads in relation to changes in volume of output reveals that there are some items of cost which tend to vary directly with the volume of Output

whereas, there are others which remain unaffected by variations in the volume of output achieved or labour hours spent. The former costs represent the variable overhead and the latter fixed overheads. Therefore, overhead cost variances can be classified as:



(i) Variable Overhead Variance: Variable overheads vary directly with the volume of output and hence, the standard variable overheads very directly with the volume of output and hence, the standard variable overhead rate remains uniform. Therefore, computation of variable overhead variance, also known as variable overhead cost variance parallels the material and labour cost variances. Thus, variable overhead cost variance (VOCV) is the difference between the standard variable overhead cost for actual output and the actual variable overhead cost. It can be calculated as follows:

VOCV = (Actual Output x Standard Variable Overhead Rate per unit) – Actual Variable Overheads

OR

= (Standard Hours for Actual Output X Standard Variable Overhead Rate per hour) –Actual Variable Overheads.

In case information relating to standard hours allowed, for actual output and the actual time (hours) taken is available, variable overhead cost variance can be further analysed into:

(a) Variable Overhead Expenditure or Spending Variance, and
(b) Variable Overhead Efficiency Variance.

(a) Variable Overhead Expenditure or Spending Variance: It is the difference between the standard variable overheads for the actual hours and the actual variable overheads incurred and can be calculated as:

Variable Overhead Expenditure Variance = (Actual Hours x Standard Variable Overhead Rate per hour)–Actual Variable Overhead

OR

VOEV = Actual Hours (Standard Variable Overhead Rate– Actual Variable Overhead Rate)

(b) Variable Overhead Efficiency Variance. It represents the difference between the standard hours allowed for actual production and the actual hours taken multiplied with the standard variable overhead rate. Symbolically:

Variable Overhead Efficiency Variance = Standard Variable Overhead Rate (Standard Hours) – Actual Hours for Actual Output.

Illustration 9. Calculate variable overhead variances from the following data:

Budgeted Production for January, 1996	3000 units
Budgeted Variable Overhead	Rs. 15,000
Standard Time for One Unit	2 hours
Actual Production for January, 1996	2,500 units
Actual Hours Worked	4500 hours
Actual Variable Overhead	Rs. 13,500.

Solution:

1. Variable Overhead Cost Variance (VOCV)

= Actual Output x Standard Variable Overhead Rate– Actual Variable Overhead
= Rs. (2500 x 5)– 13500
= Rs. 1000 (Adverse)
(Standard Variable Overhead Rate = 15000/3000= Rs. 5 per unit).

2. Variable Overhead Expenditure or Spending Variance (VOSV)

= (Actual Hours x Standard Variable Overhead Rate)– Actual Variable Overhead
= Rs. (4500 x 2.50) – 13500
= Rs. 11250 – 13500 = Rs. 2250 (Adverse)

3. Variable Overhead Efficiency Variance (VOEV)

= Standard Variable Overhead Rate (Standard Hours for Actual Output–Actual Hours)
= Rs. 2.50 (5000 – 4500)
= Rs. 1250 (Favourable)

Verification:
VOCV = VOSV + VOEV
–1000 = – 2250 + 1250
or – 1000 = –1000

(ii) FIXED OVERHEADS VARIANCE

This variance is calculated as: Actual Output x Standard Fixed Overheads Rate– Actual Fixed Overheads. (The standard fixed overhead rate is calculated by dividing budgeted fixed overheads by standard output specified). It may be divided into expenditure and volume variances.

(a) Expenditure Variance = Budgeted Fixed Overheads – Actual fixed Overheads

(b) Volume Variance:

This variance shows a variation in overhead recovery due to budgeted production being more or less than the actual production. When actual production is more than the standard production, it will show an over–recovery of fixed overheads and the variance will be favourable. On the other hand, if actual production is less than the standard production it will show an under recovery and the variance will be unfavourable. Volume variance may arise due to change in capacity, variation in efficiency or change in budgeted and actual number of working days. Volume variance is calculated as:

Actual Output x Standard Rate– Budgeted Fixed Overheads

Volume variance is sub-divided into following variances:

(i) Capacity Variance: It is that part of volume variance which arises due to overutilization or under-utilization of plant and equipment. The working in the factory is more or less than the standard capacity. This variance arises due to idle time caused by strikes, power failure, and non-supply of materials, break down of machinery, absenteeism etc.

Capacity variance is calculated as:

Standard Rate (Revised Budgeted Units– Budgeted Units) or, Standard Rate (Revised Budgeted Hrs- Budget Hrs).

(ii) Calendar Variance: This variance arises due to the difference between actual number of days and the budgeted days. It may arise due to more public holidays announced than

anticipated or working for more days because of change in holidays schedule, etc. If actual working days are more than budgeted, the variance will be favourable and it will be unfavourable if actual working days are less than the budgeted number of days Calendar variance can be expressed as:

Decrease or Increase in number of units produced due to the difference of budgeted and actual days x Standard Rate per unit.

(iii) Efficiency Variance: This is that portion of the volume variance which arises due to increased or reduced output because of more or less efficiency than expected. It signifies deviation of standard quantity from the actual quantity produced. This variance is related to the efficiency variance of labour.

Efficiency variance is calculated as:

Standard Rate (Actual Quantity – Standard Quantity) or, Standard Rate per hour (Standard Hours Produced – Actual Hours).

If Actual quantity is more than the budgeted quantity, the variance will be favourable and it will be vice versa if actual quantity is less than the budgeted quantity.

Illustration 10. From the following information calculate various overhead variances:

	Budget	Actual
Output in Units	12000	14000
No.of Working days	20	22
Fixed Overheads	36000	49000
Variable Overheads	24000	35000

There was an increase of 5% in capacity.

Solution:

Standard Fixed Overheads Rate = 36000/12000 = Rs. 3

Standard Variable Overheads Rate = 24000/12000 = Rs. 2

(i) Total Overheads Cost Variance= Actual Output x Standard Rate – Actual Overheads

= 14,000 x (3 + 2) – (49,000+ 35,000)

= 70,000 – 84,000 = Rs. 14,000 Adverse.

(ii) Variable Overheads Variance

= Actual output x Standard Variable Overheads Rate – Actual Variable Overheads

= 14,000 x 2 – 35,000 = 28,000 – 35,000 = Rs. 7,000 Adverse.

(iii) Fixed Overheads Variance

= Actual Output x Standard Fixed Overheads Rate – Actual Standard Overheads
= 14,000 x 3 – 49,000
= 42,000 – 49,000 = Rs. 7,000 Adverse.

(iv) Expenditure Variance

= Budgeted Fixed Overheads – Actual Fixed Overheads
= 36,000 – 49,000 = Rs. 13,000 Adverse.

(v) Volume Variance = Actual Output x Standard Rate – Budgeted Fixed Overheads
= 14,000 x 3 – 36,000
= 42,000 – 36,000 = Rs. 6,000 Favourable.

(vi) Capacity Variance = Standard Rate (Revised Budgeted Units – Budgeted Units)
= 3 (12,600–12,000)
= 3 (600) = Rs. 1,800 Favourable.
(Revised Budgeted Units = 12,000 + 12,000 x 5/100 = 12,600)

(vii) Calendar Variance:

Change in Number of units by change in actual and standard number of days x Standard Rate.

There is an increase of 2 working days than budgeted.
Increase in units in 2 days = 12600/20 x 2 = 1,260 units
Calendar Variance = 1,260 x 3 = Rs. 3,780 Favourable.

(viii) Efficiency Variance = Standard Rate (Actual Quantity – Standard Quantity)

Standard Quantity	= 12,000
Increase in production due to change in capacity	= 600
Increase in production due to increase in working days	= 1,260
Standard Quantity (Revised)	= 13,860

3 (14,000 – 13,860) = Rs. 420 Favourable.

4. SALES VARIANCES

A sales value variance exposes the difference between actual sales and budgeted sales. It may arise due to change in sales price, sales volume or sales mix. It is important to study profit variances. It may be classified as follows:

1. Sales Value Variance: A Sales Value Variance is the difference between budgeted sales and actual sales. It is calculated as:

Sales Value Variance = Actual Value of Sales – Budgeted Value of Sales.

If actual sales are more than the budgeted sales, the variance will be favourable and on the other hand, the variance will be unfavourable if actual sales are less than the budgeted sales.

2. Sales Price Variance: A sales price variance arises due to the difference between the standard price specified and the actual price charged. It is calculated as:

Sales Price Variance = Actual Quantity (Actual Price– Standard Price).

3. Sales Volume Variance: It is the difference between actual quantity of sales and budgeted quantity of sales. It is calculated as:

Sales Volume Variance = Standard Price (Actual Quantity of Sales – Std. Quantity of Sales)

4. Sales Mix Variance. It is the difference of standard value of revised mix and standard value of actual mix.

Illustration 11. The budget and actual sales for a period in respect of two products are as follows:

Product	Budgeted			Actual		
	Quantity (units)	Price Rs.	Value Rs.	Quantity (units)	Price Rs.	Value Rs.
X	600	3	1800	800	4	3200
Y	800	4	3200	600	3	1800

Calculate Sales Variances.

Solution:

(i) **Sales Value Variance** = Actual Value of Sales – Standard Value of Sales

Total Actual Value: 3,200 + 1,800 = Rs. 5,000

Total Standard Value: 1,800 + 3,200 = Rs. 5,000

Sales Value Variance = 5,000 – 5,000 = Nil

(ii) Sales Price Variance = Actual Quantity Sold (Actual Price – Standard Price)

Product A 800 (4– 3) = Rs. 800 Favourable

Product B 600(3–4) = Rs. 600 Unfavourable

Sales Price Variance = Rs. 200 Favourable

(iii) Sales Volume Variance = Standard Price (Actual Units – Standard Units)

Product A 3 (800 – 600) = Rs. 600 Favourable

Product B 4 (600–800) = Rs. 800 Unfavourable

Sales Volume Variance = Rs. 200 Unfavourable.

Verification:

Sales Value Variance = Sales Price Variance + Sales Volume Variance

0 = 200 + (–200)

Illustration 12. The information regarding budgeted and actual sales of two productshas been given as follows:

Product	Budgeted		Actual	
	Quantity (units)	Sales Price Rs.	Quantity (units)	Sales Price Rs.
A	800	10	1000	12
B	1200	6	1400	5

Find out variances.

Solution:

(i) Sales Value Variance = Actual Value of Sales – Standard Value of Sales

Actual Value of Sales:

Product A 1,000 x 12 = 12,000
Product B 1,400 x 5 = 7,000
Total Rs. 19,000

Standard Value of Sales:

Product A 800 x 10 = 8,000
Product B 1,200 x 6 = 7,200
Total Rs. 15,200

Sales Value Variance = 19,000–15,200 = Rs. 3,800 Favourable.

(ii) Sales Price Variance = Actual Quantity Sold (Actual Price– Standard Price)

Product A = 1,000 (12 – 10)
= 1,000 (2)
= Rs. 2,000 Favourable

Product B = 1,400 (5 – 6)
= 1,400 (–1)
= Rs. 1400 Unfavourable

Sales Price Variance = Rs. 600 Favourable

(iii) Sales Volume Variance = Standard Price (Actual Units Sold – Standard Units)

Product A = 10 (1,000 – 800)
=10(200)
= Rs. 2,000 Favourable

Product B = 6 (1,400 – 1,200)
= 6 (200)
= Rs. 1200 Favourable

Sales Volume Variance = Rs. 3,200 Favourable.

(iv) Sales Mix Variance: There is a difference between standard quantity and actual quantity, so the standard will be revised in proportion to actual quantity of sales.

Revised Standard:

Product A = 800/2000 x 2,400 = 960 Units .
Product B = 1200/2000 x 2,400 = 1,440Units

Sales Mix Variance = Standard Value of Actual Mix – Standard Value of Revised Standard Mix

Standard Value of Actual Mix:		Rs.
Product A	= 10 x 1,000	= 10,000
Product B	= 6 x 1,400	= 8,400
Total		= 18,400

Standard Value of Revised Standard Mix:		
Product A	= 10 x 960	= Rs. 9,600
Product B	= 6 x 1,440	= Rs. 8,640
Total		=Rs.18,240
Sales Mix Variance		= 18,400 – 18,240 = Rs. 160 Favourable.

Verification:

Sales Value Variance	= Sales Price Variance + Sales Volume Variance
Rs. 3,800 (Fav.)	= Rs. 600 (Fav.) + Rs. 3,200 (Fav.)
Rs. 3,800 (Fav.)	= Rs. 3,800 (Fav.)

PROFIT AND TURNOVER METHODS OF CALCULATING SALES VARIANCES

A businessman may be interested more in knowing variations in profits and sales. The profit and turnover methods of calculating sales variances will be useful for this purpose. The variances are analysed as follows:

(a) Total Sales Margin Variance: Actual Profit – Budgeted Profit.

Actual Profit = Actual quantity sold x Actual profit per unit.
Budgeted Profit = Budgeted quantity of Sales x Budgeted profit per unit.

(b) Sales Margin Variance due to Selling Price. This variance arises due to the difference between actual selling price and standard selling price. This variance is calculated as :

Actual Quantity (Actual Price – Standard Price)

(c) Sales Margin Variance due to Volume. This Variance arises due to the difference between actual quantity of sales and budgeted quantity of sales. It is calculated as:

Standard Profit per Unit (Actual Quantity of Sales – Standard Quantity of Sales).

(d) Sale Value Variance = Budgeted sales value-Actual sales value.

(e) Sales Volume Variance = Standard selling price per Unit (Actual Quantity of Sales – Standard Quantity of Sales).

(f) Selling Price Variance **=** Actual Quantity (Budgeted selling Price – ActualSelling Price).

(g) Sales Quantity Variance **=** Budgeted sale value-Revised standard sales value.

Budgeted sale value =Budgeted quantity x budgeted selling price per Unit

Standard sales value = Actual Quantity x budgeted selling price per Unit

Actual sales value = Actual Quantity x Actual selling price per Unit

Revised Standard sales value= Total Standard sales value x budgeted proportion.

(h) Sales Mix Variance= Revised Standard sales value -Standard sales value

Example 12. S. M. Ltd., has given the following budgeted and actual sales figures:

Product	Budgeted			Actual		
	Quantity (units)	Price Rs.	Value Rs.	Quantity (units)	Price Rs.	Value Rs.
A	500	60	30000	600	65	39000
B	700	40	28000	650	38	24700

The cost per unit of product A and B was Rs. 55 and Rs. 32 respectively. Compute variances to explain difference between budgeted and actual profit.

Solution:

(i) Total Sales Margin Variance **=** Actual Profit– Budgeted Profit

Or Actual Quantity x Actual Profit per Unit – Budgeted Quantity x Budgeted Profit per Unit

Actual Profit per Unit

Actual Sales Price – Actual Cost

Product A = 65 – 55 = Rs. 10

Product B = 38 – 32 = Rs. 6

Budgeted Profit per Unit = Budgeted Sale Price – Actual Cost

Product A = 60 – 55 = Rs. 5

Product B = 40– 32 = Rs. 8

Actual Profit

Product A = 600 x 10 = Rs. 6,000
Product B = 650 x 6 = Rs. 3,900
Rs. 9,900

Budgeted Profit
Product A: 500 x 5 = Rs. 2,500
Product B : 700 x 8= Rs. 5,600
Rs. 8,100
Sales Margin Variance = 9,900– 8,100 = Rs. 1,800 Favourable

(ii) Sales Margin Variance due to Selling Price:

Actual Quantity (Actual Price– Standard Price)
Product A = 600 (65-60) = Rs. 3,000 Favourable
Product B = 650 (38–40) = Rs. 1,300 Unfavourable
Sales Margin Variance due to Selling Price= Rs. 1,700 Favourable

(iii) Sales Margin Variance due to Volume:

Standard Profit per unit (Actual Quantity– Standard Quantity)
Product A: 5(600–500) = Rs. 500 Favourable
Product B: 8(650–700) = Rs. 400 Unfavourable
Sales Margin Variance due to Volume = Rs. 100 Favourable

(iv) Sale Value Variance = Budgeted sales value-Actual sales value.
= (500 x 60+700 x 40)- (600 x 65+650 x 38) = 5700 (F)

(v) Sales Volume Variance= Standard Selling Price Per Unit (Actual Quantity of Sales – Std.Quantity of Sales)

Product	Budgeted Qty.	Actual Qty	Difference	Budgeted Price Rs.	Variance Rs.
A	500	600	100 (F)	60	6000 (F)
B	700	650	50 (A)	40	2000 (A)
					4000 (A)

(vi) Selling Price Variance = Actual Quantity (Budgeted selling Price – Actual Selling Price).

Product	Budgeted Price Rs..	Actual Price Rs.	Difference	Actual Qty.	Variance Rs.
A	60	65	5 (F)	600	3000 (F)
B	40	38	2 (A)	650	1300 (A)
					1700 (F)

)

(vii) Sales Quantity Variance = Budgeted sale value-Revised standard sales value.

Product	BSV Rs..	AQ.	BP Rs.	SSV of AQ.	Revised SSV of AQ	Variance Rs.
A	30000	600	60	36000	62000x30000/58000 = 32069	2069 (F)
B	28000	650	40	26000	62000x28000/58000 =29931	1931 (F)
						4000 (F)

(viii) Sales Mix Variance = Revised Standard sales value -Standard sales value

Product	AQ.	BP Rs.	SSV of AQ.	Revised SSV of AQ	Variance Rs.
A	600	60	36000	62000x30000/58000 = 32069	3991 (A)
B	650	40	26000	62000x28000/58000 =29931	3991 (F)
					Nil

ACCOUNTING TREATMENT OF VARIANCES

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

1. Transfer to Profit and Loss Account. Under this method all variances are transferred to profit and loss account. In this method, the stock of finished goods, work-in-progress and cost of sales are shown at standard cost. It is considered that variances arise due to insufficiency or waste, so these should not become a part of normal cost of production.

2. Allocation of Variances to Finished Stock. In this method, variances are apportioned to finished goods, work–in–progress and cost of sales either on the basis of value of closing

balances or on the basis of units. This method has the effect or recording actual costs in the financial statements. The adjustment of variances is made only in the general ledger and not in subsidiary books. The distribution of variances is not made to products. The variances not being actual losses should not be taken to profit and loss account.

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

UNIT III

UNIT-2

Budgetary Control

Objectives of the Unit

- To understand the meaning of budget- its types, budgeting, process of budgeting, etc.
- To know the meaning of budgetary control system, its features, process, advantages and limitations.
- To provide knowledge about zero base budgeting- its advantages and disadvantages, methods of preparing various types of budgets.
- To disseminate the concept of lease financing and the related facts to be used by different organisations in modern times

Structure

Introduction

In today's complex business environment a good planning plays a significant role in growth development of an organization. When the plan is converted into numerical terms for setting individual and organizational goals it is known as a Budget. Further, when the business activities are controlled with the help of budgets for the attainment of predetermined goals and objectives, it is known as Budgeted Control System. A good Budgetary Control System helps in reducing the cost by avoiding unnecessary activities and hence results into increased profits of the business organization.

2.1 Meaning of Budget

When the plans of business organisation are expressed numerically or quantitatively it is known as budget. Since, the resources are always scares hence they are to be used judiciously by the management for attaining the predetermined goals or objectives. A budget helps in doing so by allocating resources to various activities of an organisation.

2.2 Features/Characteristics of Budget:

1. Budget is prepared for the attainment of specific objective.
2. Budget is prepared for a definite future period, for example, for a month, quarter, half year, a year or more.
3. It is prepared well in advance before the commencement of the period for which it is prepared.
4. It is sort of statement expressed numerically/quantitatively and is based on plans of the organization.
5. A budget is prepared by a budget committee.
6. A budget represents the managerial policies to be adopted and implemented by the organization.

2.3 Meaning of Budgeting

The process of preparing budgets by taking various steps is known as budgeting. While budgeting, a budget manual (a bundle of budget policies) is prepared having details regarding the budget to be prepared, a budget controller (budget director or budget officer) is appointed for the purpose and a budget committee is constituted under his chairmanship having members from various departments of the organisation. Sometime outside experts are also appointed as members of budget committee, if needed. The budget period, procedure and key factors are also considered while budgeting.

2.4 Meaning of Budgetary control

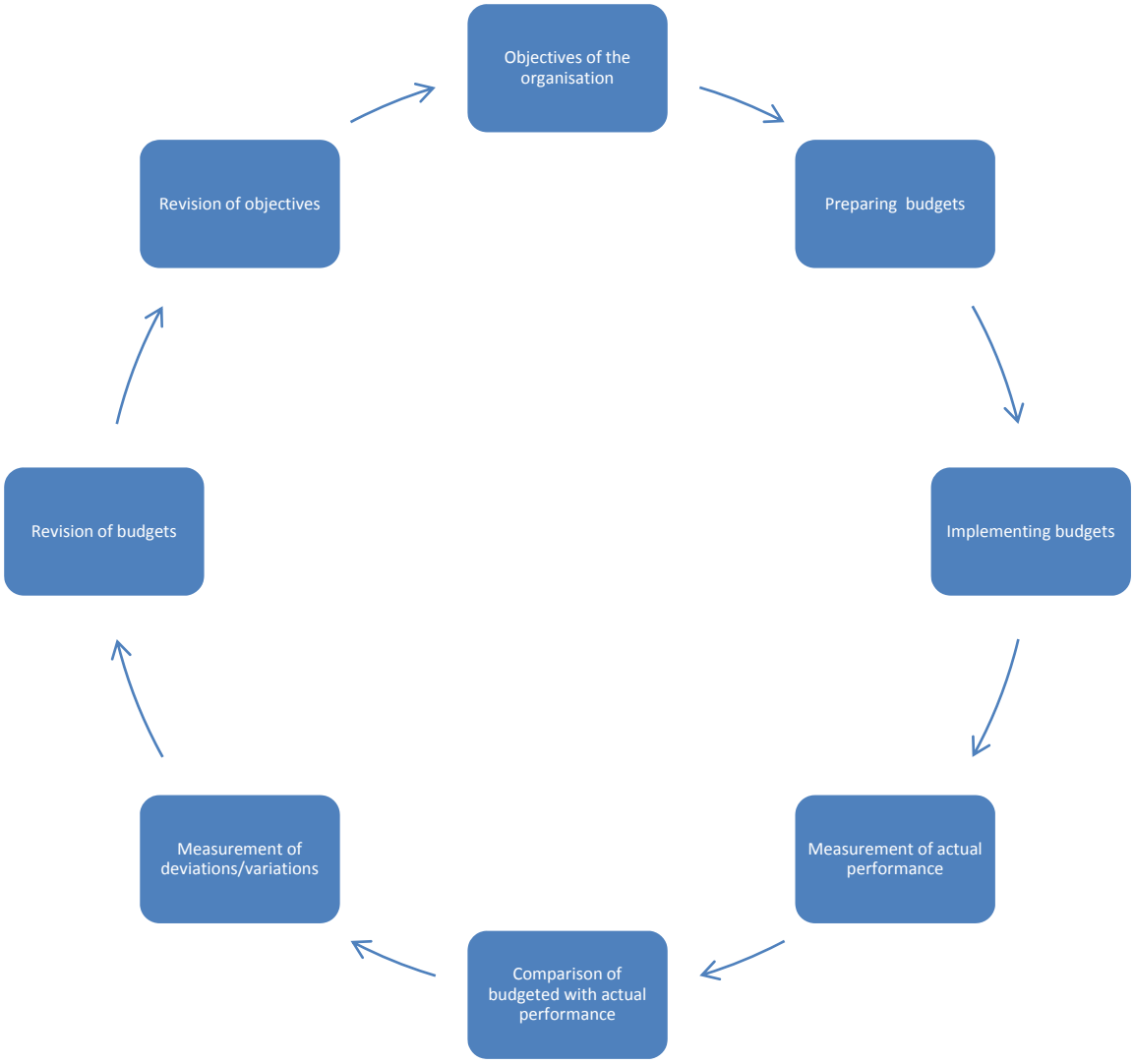
When the business activities are controlled by the management with the help of budgets for the attainment of predetermined objectives of the organisation, it is known as budgetary control/budgetary control system. Under the system, first the budgets are prepared and implemented by the management, actual performance is measured and deviation/ differences with the budgeted performance are calculated and consequently the remedial actions are initiated/ taken for the betterment.

2.5 Objectives/benefits/advantages/uses/significance of Budgetary Control

If someone asks you as why do you wear clothes? Probably you will give the same answer but with different words which suit the language of the question. Hence, when we talk about the objectives/benefits/ you wear clothes or what are the objectives/benefits/advantages/uses/significance advantages/uses/significance of budgetary control the answer will be the same one but by moulding the words as per the language of the questions and the same may be summarized as follows:

1. **Effective planning and fixation of objectives:** It is possible with the budgetary control system to identify and study various types of problems with which the organization is confronting with and consequently the future courses of action in the form of effective planning are possible to be adopted. Similarly, the budgetary control system points out strong and weak points of the organization therefore it is easy to set the objectives for the organization with the help of it.

Figure 2.1 Objectives of Budgetary Control



2. **Better co-ordination:** An organization becomes capable of adopting better coordination among various types of activities performed by it for the accomplishment of individual/departmental/organizational goals by learning through experiences of budgetary control system which helps in increasing the efficiency of overall organization.
3. **Better utilization of resources:** Limited resources of the organization are allocated judiciously under budgetary control by taking into considerations various types of activities to be performed by different departments for attaining the overall objectives of the organization. In this way, the best use of available resources is made by the management and the individual goals are clearly defined for the use of the same.
4. **Cost control:** Under the system, utmost care is given for the best utilization of resources and consequently attaining the personal and organizational goals as per the budgeted targets. The actual performance is to be compared with budgeted performance and accountability of individuals may be fixed easily, therefore, especial attention is given towards the cost control which ultimately increases the efficiency and effectiveness of the organization.
5. **Increase in revenues:** As with the help of budgetary control system an organization is capable of controlling the cost of its goods and services and hence, by having competitive advantage over its competitors, the selling price is fixed at lower level which consequently helps in increasing the demand of the products by the customers. In this way by making more sales the organization increases its revenue.
6. **More profits:** By adopting the budgetary control technique an organization generates more surpluses by increasing its revenue and controlling its costs. In this way it earns more profits on its capital employed.
7. **Better financial position:** Better earning capacity attained by the organization through adoption of budgetary control system leads to a better financial position of the organization year over year in the form of increased reserves and surpluses and better asset base.
8. **Better control:** Under budgetary control system, the targets are assigned to the employees of the organization in the quantitative terms by preparing budgets. Hence, both the subordinates and superiors are well aware about their duties to be performed and controlled respectively. In this way, the system paves way for better control over various activities of the organization.
9. **Fulfilling Corporate Social Responsibility:** By having better performance in the form of increased rate of return on capital employed and sound financial position, the organization becomes capable of fulfilling its corporate social responsibility towards various stakeholders such as owners, management, creditors, suppliers, bankers, government, society, etc.
10. **Expansion and modernization:** The expansion and modernization of an organization is based on two things – capital and technology which are possible to be created with the help of adoption of budgetary control system by generating more and more profits year over year which leads to more capital formation and heavy assets base. Hence, with the enhanced financial power it is very much possible to expand more amounts on research and development activities and

purchase of latest technology for the growth and development of the organization. Maruti Udyog Limited is the best example to support the point of view.

11. **Employment generation:** The business organization adopting the budgetary control techniques is bound to grow fast and hence create more employment opportunities by expanding its areas of operations.
12. **Better standard of living:** Such types of organization having budgetary control provides better products and other amenities to their stakeholders which leads towards their better standard of living in the form of better food, shelter and clothing, etc.
13. **Economic growth:** If more and more business organizations adopt budgetary control system then there is a possibility of more growth and development in an economy with more profits and better financial positions of the organizations. It may help in abolishing the poverty from the economy by creating more job opportunities.

2.6 Pre-requisites of successful budgeting

The following are the essentials to successful budgetary control techniques:

1. An organization with well defined objectives, appropriate structure, proper classification of activities, clearly defined authority and responsibility etc.
2. A good accounting system having proper records of all the activities and capable of providing necessary information in time.
3. The superiors of the organization should support their subordinates from time to time whenever they are in need of.
4. A management system comprising of reward and punishment is also needed.
5. A better co-coordinating system among the employees and activities of the organization is also needed in the adoption of budgetary control system.

2.7 Limitations of Budgetary Control System

The following are main limitations of budgetary control system:

1. **Lack of co-ordination and co-operation:** If an organization is lacking in co-ordination and co-operation, the budgetary control system may not give desired results.
2. **Stress on the employees:** The system passes on targets to the employees whom they are supposed to attain in any case within a time framework causes stress in the minds of employees leading to ill health and other related issues.
3. **Proper support of top-level management:** For the success and implementation of budgetary control system a proper support from the top- level management is always required
4. **Improper accounting system:** If the accounting system of the organization is not properly maintained then the budgetary control system may not be successful.
5. **Improper control system:** If the control system of the organization is not appropriate and prompt then the chances of failure of budgetary control system increase substantially.

6. **Biased attitude of management:** The success of the budgetary control system depends on the fair and honest behavior of the management but if it is biased then the reverse may happen.

2.8 Types of budgets

Budgets may be classified on the basis of:

1. Time
2. Functions
3. Flexibility

Types of budgets on the basis of time:

a) Short-term budgets: These are the budgets which are prepared for a short period ranging from one year to five years.

b) Current budgets: These are very short term budgets such as weekly, fortnightly, monthly and quarterly etc. which are to be implemented in near future.

c) Long term budgets: The budgets which are prepared for a long period (more than five years) of time.

Types of budgets on the basis of functions/functional budgets:

These are the budgets based on the functions of the organisations:

a) Material Budget
b) Labour Budget
c) Production Budget
d) Overhead cost Budget
e) Sales budget
f) Personnel Budget
g) Plant utilization Budget
h) Cash Budget
i) Research and development Budget
j) Master Budget (it is the summary of all functional budgets), etc.

On the basis of flexibility:

a) Fixed Budgets: The budgets which are prepared with fixed standards or level of activities and there is no provision of making change in them.

b) Flexible Budgets: These are the budgets the estimates of which have tendency to be change as per the change circumstances.

c) Semi-flexible Budgets: These are the budgets denoting a part of them not to be changed but some of the estimates have provisions to have changes as per the changed circumstances.

SALES BUDGET

Example 2.1: Shiva Ltd. produces two kinds of products, P and Q and put them for sale in two districts i.e. Faridabad and Delhi markets. The information related to production and sale of products for the year ending 31st March, 2019 is as follow:

Market	Product	Budgeted Sale	Actual Sale
Faridabad	P	500 at ₹ 11 each	600 at ₹ 11 each
	Q	400 at ₹ 13 each	300 at ₹ 13 each
Delhi	P	600 at ₹ 11 each	800 at ₹ 11 each
	Q	500 at ₹ 13 each	400 at ₹ 13 each

It is observed that product P is overpriced while Product Q is underpriced and if price of product P is decreased by Rs. 1 and price of product Q is increased by Rs. 2, then it is estimated that the sale would be increased in following manner:

Product	Faridabad	Delhi
P	10%	10%
Q	20%	5%

Also, it is further estimated that the use of sales promotional scheme would also raise the sales of product as follow:

Product	Faridabad	Delhi
P	50 Units	40 Units
Q	20 Units	75 Units

Prepare a sales budget including the above estimates for the year ending 31st March, 2020

Solution:

Sales Budget for the year ending 31st March, 2020

Market	Product	Current Year Budget			Future Period Budget			Actual Sales		
		Units	Price ₹	Amount ₹	Units	Price ₹	Amount ₹	Units	Price ₹	Amount ₹
Faridabad	P	500	11	5,500	600	10	6,000	600	11	6,600
	Q	400	13	5,200	500	15	7,500	300	13	3,900
	Total	900		10,700	1,100		13,500	900		10,500
Delhi	P	600	11	6,600	700	10	7,000	800	11	8,800
	Q	500	13	6,500	600	15	9,000	400	13	5,200
	Total	1,100		13,100	1,300		16,000	1,200		14,000
Total	P	1,100	11	12,100	1,300	10	13,000	1,400	11	15,400
	Q	900	13	11,700	1,100	15	16,500	700	13	9,100
	Total	2,000		23,800	2,400		29,500	2,100		24,500

CASH BUDGET

Receipts and Payments Method

Example 2.2: You are required to prepare a cash budget for the month June, July and August for the year ending 31st March, 2020 on the basis of following information:

Month	Credit Sales ₹	Raw Material ₹	Labour Expenses ₹	Manufacturing Expenses ₹
April	2,40,000	1,68,000	20,000	14,000
May	2,60,000	2,00,000	24,000	16,000
June	1,60,000	2,08,000	16,000	12,000
July	2,32,000	2,12,000	20,000	24,000
August	1,76,000	1,60,000	16,000	12,000

Additional Information:

1. Balance of cash on 1st June, 2019 is ₹ 10,000.
2. Machinery purchased of Rs. 50,000 in August, out of which 10 per cent is to be paid in cash while rest is paid after one month.
3. Advance tax is to be paid in the month of June of Rs. 5,000.
4. Credit period allowed as follow: (a) for customers – 2 months, (b) for suppliers – 1 month, (c) for manufacturing expenses – half month.
5. Rent is to be received in the month of July of Rs. 10,000.

Solution:

Cash Budget for the Year ending 31st March, 2020

Particulars	June	July	August
Opening Balance	10,000	9,000	33,000
Budgeted cash receipts:			
Received from Debtors	2,40,000	2,60,000	1,60,000
Rent Received	-	10,000	-
Total Receipts 'A'	2,50,000	2,79,000	1,93,000
Budgeted cash payments:			
Creditors	2,00,000	2,08,000	2,12,000
Labour Expenses	16,000	20,000	16,000
Manufacturing Expenses	14,000	18,000	18,000
Tax paid in advance	5,000	-	-
Machinery Purchased	-	-	5,000
Total Payments 'B'	2,35,000	2,46,000	2,51,000
Closing Balance 'A - B'	9,000	33,000	(58,000)

Working notes:

1. The closing balance of every month is the opening balance of next month.
2. Labour charges are paid in the month in which it incurred.
3. Half of the manufacturing expenses of the month May and half of June will be paid in the month of June and so on: ½ (16000) + ½ (12000) = 14000, ½ (12000) + ½ (24000) = 18000 and so on.

FLEXIBLE BUDGET

Example2.3: A factory in Nelco Motor Co. currently produces 5,000 units while working at 50% capacity. At 80% capacity, cost of material will raise 2% and selling price will be go down by 2%. Also, at 100% capacity cost of materials move up by 5% and selling price will be move down by 5%.

The selling price of the product is ₹ 300 per unit at 50% capacity and cost per unit is as follow:

	₹
Materials	150
Labour	40
Work Expenses (60% variable)	20
Administration and office Expenses (50% variable)	40
	250

Help Nelco Motor Co. in estimating its profits when it works at 80% and 100% of its capacity

Solution:

FLEXIBLE BUDGET

	Existing		*Proposed*
Level of Activity	50%	80%	100%
No. of Units	5,000	8,000	10,000
Variable Costs:	₹	₹	₹
Material	7,50,000	12,24,000	15,75,000
Labour	2,00,000	3,20,000	4,00,000
Work Overhead	60,000	96,000	1,20,000
Administration and office overhead	1,00,000	1,60,000	2,00,000
Total Variable Costs….(i)	11,10,000	18,00,000	22,95,000
Fixed Costs:			
Work Overhead	40,000	40,000	40,000
Administration and office overhead	1,00,000	1,00,000	1,00,000
Total Fixed Costs……...(ii)	1,40,000	1,40,000	1,40,000
Total Costs (i)+(ii)	12,50,000	19,40,000	24,35,000
Sales Value	15,00,000	23,52,000	28,50,000
Profit	2,50,000	4,12,000	4,15,000

Adjusted Profit and Loss Method

Example 2.4: The Prepare a cash budget of ABC Ltd. using adjusted profit and loss method on the basis of following information:

BALANCE SHEET
as at 31st March, 2019

Liabilities	₹	*Assets*	₹
Equity Share Capital	2,00,000	Building	1,00,000
Reserve	40,000	Machinery	50,000
Accumulated Profit	20,000	Trade receivable	80,000
Trade payable	1,00,000	Inventory	40,000
Bills Payable	20,000	Bills Receivables	10,000
Outstanding interest	4,000	Prepaid rent	2,000
		Bank Balance	1,02,000
	3,84,000		3,84,000

PROJECTED TRADING AND PROFIT AND LOSS ACCOUNT
As on 31st March, 2020

		₹		₹
To Opening Stock		40,000	By Sales	4,00,000
To Net Purchases		3,00,000	By Closing Stock	30,000
To Carriage		4,000		
To Gross Profit c/d		86,000		
		4,30,000		4,30,000
To Interest		6,000	By Gross Profit b/d	86,000
To Salaries		12,000	By miscellaneous Receipts	10,000
To Depreciation (10% on building and Machinery)		15,000		
To Interest	12,000			
(Less) Outstanding Interest	(4,000)			
	8,000			
(Add) Outstanding interest	2,000	10,000		
To Rent	6,000			
(Add) Prepaid rent	2,000	8,000		
To carriage outwards		4,000		
To Advertisement		2,000		
To Net Profit carried down		39,000		
		96,000		96,000

To Preference Dividends	16,000	By last year profit	20,000
To transfer to Reserve	8,000	By Net Profit for current year	39,000
To Balance transferred to balance sheet	35,000		
	59,000		59,000

Balances at the end are as follow:

Equity Share Capital ₹ 2,20,000, 7% Loan ₹ 50,000, Trade payable ₹ 80,000, Trade receivable ₹ 1,20,000, Bills Payable ₹ 22,000, Bills Receivables ₹ 4,000, Fixtures ₹ 25,000, Vehicles ₹ 40,000. Vehicles and fixtures are purchased at the closing of the year.

Solution:

Cash Budget as on 31st March, 2019

		₹
Opening Balance		1,02,000
	₹	
Add: Current year Net Profit	39,000	
Depreciation	15,000	
Decrease in Bills Receivables	6,000	
Increase in Bills Payable	2,000	
Issue of Equity Shares Capital	20,000	
Issue of Loan	50,000	
Decrease in Prepaid Rent	2,000	
Decrease in inventory	10,000	1,44,000
		2,66,000
Less: Purchase of Machinery	40,000	
Purchase of Fixtures	25,000	
Increase in Trade receivable	40,000	
Decrease in Trade payable	20,000	
Decrease in Outstanding interest	2,000	
Preference Dividends	16,000	1,63,000
Closing Balances as at 31st March, 2020		83,000

Balance Sheet Method

Example 2.5: According to the previous example, prepare the cash budget using balance sheet method.

Solution:

BUDGETED BALANCE SHEET
as at 31st March, 2020

Liabilities	₹	Assets		₹
Equity Share Capital	2,20,000	Premises	1,00,000	
7% Loan	50,000	*Less:* Depreciation	10,000	90,000

Reserve	48,000	Machinery	50,000	
Accumulated Profit	35,000	*Less:* Depreciation	5,000	45,000
Trade payable	80,000	Fixtures		25,000
Bills Payable	22,000	Trade receivable		1,00,000
Outstanding Interest	2,000	Bills Receivables		4,000
		Vehicles		40,000
		Inventory		30,000
		Bank (Balancing Figure)		1,23,000
	4,57,000			4,57,000

MASTER BUDGET

A specimen of master budget is as follows:

MASTER BUDGET

Period… Normal Capacity…… Budgeted Capacity…..

	Product X	Product Y	Product Z	Total
	₹	₹	₹	₹
Sales (A)	60,000	80,000	1,00,000	2,40,000
Cost of Sales (B):				
Raw Materials	10,000	12,000	14,000	36,000
Direct Wages	10,000	8,000	6,000	24,000
Manufacturing Expenses	8,000	6,000	8,000	22,000
Factory Expenses (Fixed)	10,000	10,000	12,000	32,000
	38,000	36,000	40,000	1,14,000
Add: Opening Stock of material	10,000	4,000	8,000	22,000
	48,000	40,000	48,000	1,36,000
Less: Closing Stock of material	8,000	8,000	4,000	20,000
	40,000	32,000	44,000	1,16,000
Gross Profit (C = A – B)	20,000	48,000	56,000	1,24,000
Less: Other Expenses (D)				
Office Expenses	10,000	10,000	10,000	30,000
Sales promotion expenses	6,000	10,000	10,000	26,000
	16,000	20,000	20,000	56,000
Net Profit (C – D)	4,000	28,000	36,000	68,000
Assets:				
Non Current	40,000	40,000	60,000	20,000
Current	30,000	36,000	24,000	10,000
Total capital employed	70,000	76,000	84,000	30,000

**You are required to fill up the columns given below.*

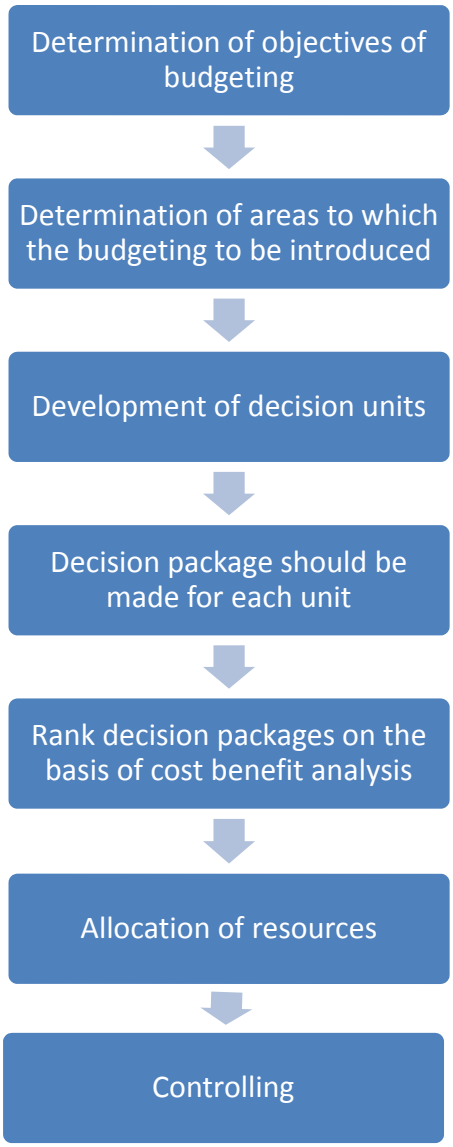
Ratios				
Net Profit/ Total Capital employed	……	……	……	……
Net Sales/ Total Capital employed	……	……	……	……
Net Profit/Sales	……	……	……	……
Current Ratio	……	……	……	……
Quick Ratio	……	……	……	……
Appropriation of profit				
Preference and Equity Dividends	……	……	……	……
Transfer to Reserves	……	……	……	……
Balance of profit of loss	……	……	……	……

2.9 Zero base budgeting

As the name suggests is beginning from zero base or 'De nova budgeting'. It is a process of preparing budgets from scratch or from the zero base. It is based on the underlying assumption that the previous year was zero. Here manager has to give justification of all expenses included in the budget. Process involves first step being recognizing department/segment/organisation activities as decision package then systematic analysis is conducted to evaluate the same and ranking them in order of significance.

Zero base budgeting is a shift from the traditional method of budgeting where former is based on programme oriented and decision oriented approach and latter on functionally oriented spending approach.

2.10 Procedure of setting up Zero base budgeting



2.11 Advantages

1. It ensures better utilization of organization resources as it works on the requirements and benefits.
2. It ensures that manager undertake programs that are indispensable for an enterprise and being performed in effective way.
3. It assists management in approving the budget on the ground of cost benefit analysis.
4. It helps managers in identifying uneconomical activities and proposes the alternative ways of performing activities.

5. It helps in increasing coordination and communication among the segment/department of the organization.
6. It is suitable in service department.

2.12 Disadvantages

It requires identification and development of decision packages which is time consuming process and involves a paperwork at large scale.

In case benefits cannot be determined of decision packages then their ranking is not possible which cause a problem in zero base budgeting process.

This approach of budgeting requires trained and skilled manpower causing it to be an expensive activity.

This approach of budgeting requires managers of decision units to be equipped with the idea behind the concept of zero base budgeting and training in the process of its introduction and effective implementation.

2.13 LEASE FINANCING

Meaning: The assets play a significant role in carrying out the business activities. Buying fixed assets particularly needs a lot of funds which are to be procured by the business organisation from the appropriate sources. Hence, it can be said that two functions of financial management mainly financing and investment are involved in purchase of fixed assets by a business organisation. Sometimes, buying an asset for cash may adversely affect the cash position of an organisation hence alternate method having assets are evolved. One of such method is lease financing where the asset is procured from its owner by the business under an agreement whereby generally the ownership remains with the owner but he permits to use his asset by other party in consideration of rent which is an income for landlord and expense for borrower. Under the agreement the owner of the asset such as land, building, plant and machinery, vehicle, etc. is known is lesser and the second party who takes the asset is known as lessee. Both the parties enter into a contract of lease having terms and conditions such as time period of lease, amount and time of instalments, maintenance of assets, risk, etc. According to Indian Accounting Standard 17 – "Lease finance can be said to be a contract between lesser and lessee whereby the former acquires the equipment goods plants as required and specified by the lessee and passes on the goods to the lessee for use for a specified place and in consideration, lessee promises to pay the lesser a specified sum in a specified mode at specified interval and at a specified place"

2.14 Features/characteristics of Lease:

1. It is a type of contract between owner of asset and the party using that asset.
2. Under the contract of lease, the owner of the asset is known as lesser and the second party as lessee.
3. The ownership of asset remains with the lesser.
4. The lessee makes payment of an agreed amount (lease rent) at regular intervals to the lesser which is expense for lessee and income for lesser.

2.15 Types of lease

1. Finance lease
2. Operating lease
3. Leveraged lease

Finance lease: It is a long term lease having a time period of three years or more. Generally, this type of contract is made for whole life of the asset and normally the asset is sold out to the lessee by the lesser on the expiry of the lease period. It is thought that the lesser recovers the total cost of asset and including the maintenance charges from the lessee during the period under contract though the lessee incurs all maintenance and expenses including insurance etc. on the asset. This type of lease is also known as capital lease and the asset is shown in the balance sheet of lessee.

Operating lease: Under this type of lease the asset is taken by lessee from lesser for a short period and the asset is returned back to lesser after the expiry of the lease period. Under this contract all maintenance charges including insurance are born by lesser and the asset is not shown in the balance sheet of the lessee.

Leveraged lease: Sometimes, a very big amount is needed to buy an asset. The lesser takes the partial (i.e. 30 to 40 per cent) help of banks or financial institutions to buy the asset and allows the lessee to use the asset and makes the alternate arrangement for the balance required funds. The interest on which is generally paid by lessee.

Sale and lease back: Under this lease, the owner of the asset sells the asset to someone to get the money and hires the same asset from the buyer on lease.

Domestic lease: Under this lease, both lesser and lessee belong to the same nation.

International lease: When the lesser and lessee belong to different country then it is called international lease.

Primary lease: When the rent of the asset is calculated in such a way that the cost of asset and reasonable rate of return on it is charged from the lessee by the lesser over the period of lease.

Secondary lease: Under this lease, the rent of the asset is settled at very low. This type of lease is also called Front and & Back Ended Lease.

2.16 Difference between finance and operating lease

Basis of difference	**Finance lease**	**Operating lease**
Time period	Long term- generally covering the life time of the asset.	Short term
Maintenance charges	Borne by lessee	Borne by lesser
Risk on asset	Borne by lessee	Born by lesser
Returns in the form of rent	Cost plus profit	May or may not be

Types of assets	Usually, high cost assets for example, land building, plant and machinery, etc.	Less costly assets
Sale of asset	Usually, done at the expiry of the contract period	Generally, the asset is not sold under this contract

2.17 LEASE FINANCING: Determination of Lease Rentals:

The lease rentals are calculated by taking following steps:

1. **Calculation of total cost of asset including installation and other charges**
2. **Calculation of cash flows to the lesser by taking into consideration tax advantage due to depreciation and investment allowance.**
3. **Calculation of present value of cash flows.**
4. **Calculation of net present value by comparing the present value of cash flows and total cost of asset.**
5. **Calculation of post and pre-tax rentals**

Determination of Lease Rentals

Harman Ltd. is suppose to lease out a machine costing ₹ 15,00,000 for 5 years (useful life of machine) whereas salvage of the same is ₹ 2,00,000. Harman Ltd. can claim a depreciation of 20% on W.D.V. of the machine but cannot claim investment allowance. The corporate tax applicable to firm is 50% and required rate of return (post-tax) is 12%. Calculate the lease rentals which should be charged by Harman Ltd.

Note:

1) PV Factor @ 12% is as follows:

Year	
1	0.893
2	0.797
3	0.712
4	0.636
5	0.567

2) Annuity value at 12% discount factor for 5 years is 3.605.

Solution:

(i) Cost of machine = ₹ 15,00,000

(ii) Calculation of cash flows to Harman Ltd.:

Year	*Amount of Depreciation* (₹)	*Tax Advantage on Depreciation* (₹)	*Tax Advantage on Investment Allowance* (₹)	*Salvage Value* (₹)	*Total Cash Flows* (₹)
1	3,00,000	1,50,000	Nil	-	1,50,000
2	2,40,000	1,20,000	-	-	1,20,000
3	1,92,000	96,000	-	-	96,000
4	1,53,000	76,800	-	-	76,800
5	1,22,800	61,440	-	2,00,000	2,61,440

(iii) Calculation of Present Value of Cash Flows:

Year	*Cash Flows* (₹)	*P.V. Factor at 12%*	*P.V. of Cash Flows* (₹)
1	1,50,000	0.893	1,33,950
2	1,20,000	0.797	95,640
3	96,000	0.712	68,352
4	76,800	0.636	48,844.80
5	61,440	0.567	1,48,236.48
		Total	4,95,023 (rounded off)

(iv) Minimum required net recovery through lease rentals:

MRLR = ₹ 15,00,000 - ₹ 4,95,023

= ₹ 10,04,977

(v) Post-tax Lease Rentals (PTLR) = $\frac{10,04,977}{3.605}$

= ₹ 2,78,773

(vi) Pre-tax Lease Rentals

$$= 2,78,773 \times \frac{100}{50}$$

= ₹ 5,57,546

Lease Rentals in terms of lease financing

$$= 5,57,546 \times \frac{1000}{15,00,000} \times \frac{1}{12}$$

= ₹ 30.97 per thousand per month.

Or,

₹ 371.64 per thousand per year.

2.18 Financial evaluation from lessor's point of view

The lease or buy decision by the lesser may be make either with the help of present value or internal rate of return method.

Present Value Method: Under this method, the cash outflows are calculated by taking into consideration the tax advantages and cash inflows after tax are also calculated with the help of discounting rate. After that, present values of cash inflows or outflows are compared and decisions are made.

Internal Rate of Return Method: Under this method, the rate of return on the lease asset is calculated and compared with market rate of return which helps in taking the appropriate decision.

By using the information given below, advice whether X Ltd. should lease out its machine or not?

Cost	₹ 5,00,000
Average cost of capital (lessor)	12%
Depreciation n Machine	20% on original cost
Useful Life of Machine	5 years
Scrap Value	-
Lease Rentals due at the end of each five years	₹ 2,00,000
Corporate Tax	35%
Present Value of an annuity of ₹ 1 for five years at 12% is ₹ 3.605	

Solution:

(i) Calculation of Cash Outflows:	**(₹)**
Cost of Equipment	5,00,000
Less: Tax Advantage	Nil
Cash Outflow	5,00,000

(ii) Calculation of After-Tax Cash Inflows:	**(₹)**
Lease Rentals	2,00,000
Less: Depreciation	1,00,000
Earning Before Tax (EBT)	1,00,000
less: Tax at 35%	35,000
Earning After Tax (EAT)	65,000
Add: Depreciation	1,00,000
Cash Inflows After-Tax (CFAT)	1,65,000

(iii) Computation of P.V. of Cash Outflows:

Year	*Cash Outflows (₹)*	*P.V. Discount Factor at 12%*	*P.V. of Cash Outflows (₹)*
0	5,00,000	1.00	5,00,000

(iv) Computation of P.V. of Cash Inflows:

Year	Cash flow After-Tax (CFAT) (₹)	*P.V. Annuity Discount Factor at 12%*	*P.V. of Cash Inflows (₹)*
1-5	1,65,000	3.605	5,94,825

(v) Calculation of Net Present Value:

P.V. of Cash Inflows	5,94,825
Less: P.V. of Cash Outflows	5,00,000
N.P.V. of Cash Flows	94,825

Since, the present value of Cash Inflows is greater than that of Cash Outflows, or, we can say that N.P.V. is positive, so it is advised that X Ltd. should lease out machine.

2.19 Financial evaluation from lessees' point of view

Infinity Ltd. is considering the option of acquiring the use of equipment costing ₹ 8,00,000.

There are two options:

i. To borrow ₹ 8,00,000 at 18% p.a. which is repayable in five equal installments; or

ii. To take equipment on lease for 5 years with lease rentals ₹ 1, 50,000.

Depreciation is allowed at 20% (straight line method) and tax rate is 50%. At the end of 5th year, the equipment will have a salvage value of ₹ 2, 00,000. What do you suggest to Infinity Ltd. about lease or buy decision.

Note:

1) PV Factor at 18% discount rate is as follows:

Year	
1	0.847
2	0.718
3	0.609
4	0.516
5	0.437

2) The P.V. of an annuity of ₹ 1 at 18% for 5 years is ₹ 3.127.

Solution:

(i) Calculation of Loan Installment:

$$\text{Loan Instalment} = \frac{\text{Amount of Loan}}{\text{P.V. Factor of Annuity}}$$

$$= \frac{8,00,000}{3.127}$$

= ₹ 2,55,836 approx.

(ii) Table Showing Loan Payment:

Year	*Loan Balance at begning of the year (₹)*	*Loan Instalment (₹)*	*Interest Payment on Outstanding Loan (₹)*	*Principal Payment*	*Loan Balance at end of the year (₹)*
1	8,00,000	2,55,836	1,44,000	1,11,836	6,88,164
2	6,88,164	2,55,836	1,23,870	1,31,966	5,56,198
3	5,56,198	2,55,836	1,00,116	1,55,720	4,00,478
4	4,00,478	2,55,836	72,086	1,83,750	2,16,728
5	2,16,728	2,55,739	39,011	2,16,728	Nil

- Amount of *Interest Payment on Outstanding Loan is rounded off.*
- *Amount of Loan Instalment in the 5th year is different because of compensation for rounding error.*

(iii) Calculation of P.V. of After-Tax Cash Outflows (Buying Option):

Year End	*Loan Instalment (₹) (1)*	*Tax Saving on*			*Net Cash Outflows (₹) (3 = 2 - 1)*	*P.V. Factor at 18% (4)*	*P.V. of Net Cash Outflows After Tax (₹) (5)*
		Interest (₹)	*Depreciation (After Tax) (₹)*	*Total (₹) (2)*			
1	2,55,836	72,000	80,000	1,52,000	1,03,836	0.847	87,949
2	2,55,836	61,935	80,000	1,41,935	1,13,901	0.718	81,781
3	2,55,836	50,058	80,000	1,30,058	1,25,778	0.609	76,599
4	2,55,836	36,043	80,000	1,16,043	1,39,793	0.516	72,133
5	2,55,739	19,505	80,000	1,53,234	1,56,234	0.437	68,274
						Total	3,86,736
						less: P.V. of salvage value at the end of 5th year (2,00,000 × .437)	87,400
							2,99,336

(iv) Calculation of P.V. of After-Tax Cash Outflows (Lease Option):

Year End	*Lease Rental (₹)*	*Tax Savings on Lease Rent (₹)*	*After-Tax Cash Outflows (₹)*	*P.V. Factor at 18% (₹)*	*Total P.V. of Cash Outflows (₹)*
1 - 5	1,50,000	75,000	75,000	3.127	2,34,525

Since the P.V. of cash outflows (after tax) under lease option is less than P.V. of cash outflows (after tax) under buying option, Infinity Ltd. is suggested to take equipment on lease.

2.20 Benefits/advantages of Lease

1. **Low cost:** Since, the asset is not purchased at the time of contract and only lease rental is paid. Therefore, it saves the cost of assets from the view point of lessee.
2. **Saves time:** To have asset under lease generally takes less time in comparison to buying asset on loan basis.
3. **Reduces the risk of obsolescence:** Under the contract of lease if the asset becomes outdated due to change in technology, it can be easily be transfer back to lesser by the lessee to avert the risk.
4. **More profits:** A business organization not only makes the use of the asset by spending very low amount but also uses capital thus saved alternatively to enhance its profits.
5. **Tax saving:** Both the lesser and the lessee get the advantage of tax benefit under the contract.
6. **Better financial position:** With the help of the lease contract the borrowing capacity of the business remains unchanged. Hence, the possibility of further financial consolidation remains open.
7. **Saves from inflation:** The cash flows of the business are not affected by inflation due to fixed payment for the asset under lease.
8. **Helps in planning:** Planning regarding the cost of the asset can easily be made under the contract of lease.
9. **Better cash management:** The cash which is said to be the life blood of the business organization can be managed better under the lease.

2.21 Disadvantages

1. **More expensive:** As the lease rentals also include profit charged by lesser, therefore it is a costly affair for lessee to get the asset under lease.
2. **Risk of technological change:** Technology changes very fast and consequently the asset become out of fashion and are returned back to lesser by lessee causing heavy loss to the owner.
3. **No alteration in the asset:** Generally the lessee is not allowed to make changes in the asset and hence, he cannot use it in a way he wants.
4. **Loss due to inflation:** Sometimes, the lessee does not take the advantage of availability of asset at low prices in market and has the only option to get it on lease from lesser when its prices hiked in the market.

5. **Difficult terms and conditions:** Generally, the terms and conditions of the contract of lease are very complex to understand and implement.
6. **Termination complex:** The provisions of heavy penalty are made in the contract if it is terminated before time.
7. **Difficult to assess the lease rentals:** Personal biases from both the parties may affect the real calculations of lease rentals.
8. It is very difficult for the lesser to decide whether he should lease out the asset or not.
9. It is very difficult to take lease or buy decision by the lessee under complex business environment.

2.22 Questions for Practice

Short Answer Type Questions

1. Define budget.
2. Explain budget manual
3. What do you mean by budgetary control?
4. Differentiate between forecast and budget.
5. Elucidate zero base budgeting.
6. Explain flexible budget.
7. What is lease financing?
8. Write short notes on following:

a) Lease rental
b) Financial lease
c) Sales and lease back
d) Limitations of lease financing

Long Answer Types Questions

1. What do you understand by budgetary control? Explain its advantages and disadvantages.
2. What are the considerations which govern the installation of a budgetary control system? Examine.
3. What is master budget? Illustrate the preparation of master budget.
4. Differentiate between fixed and flexible budget.
5. Discuss the essentials of a good budgetary control system. Explain briefly the steps in setting up a budgetary control system so that its working efficiency is ensured.

6. "Why do responsible people in an organization agree to accept budgetary control in theory but resist in practice?"
7. What is lease financing? How it is determined?

Suggested Readings:-

1. J.K. Aggarwal, R.K. Aggarwal, M.L. Sharma – Accounting for Managerial Decisions– Ramesh Book Depot, Jaipur.
2. R. Kishore–Advance Management Accounting–Taxman allied Services Pvt. Ltd.
3. M.Y. Khan, P.K. Jain–Management Accounting–Tata McGraw Hill
4. Horngren, Sundem, Stratton–Introduction to Management Accounting-Pearson Education
5. S.N. Mittal–Accounting & Financial Management – Shree Mahavir Book Depot, Nai Sarak, New Delhi.
6. Anthony, Robat N., Hawkins and Merchant Management Ac