UNIT 10 VARIANCE ANALYSIS

Objectives

This unit aims at:

- acquainting you with the ways in which the management can monitor and guide the operations of a business to meet the desired goals, particularly in respect of costs and sales.
- helping you in identifying the factors responsible for deviation of actual performance from the standard performance and in taking such remedial measures as may be necessary.

Structure

10.1 Introduction

10.2 Meaning of Variance

10.3 Cost Variances

10.4 Direct Material Variances

10.5 Direct Labour Variances

10.6 Overhead Variances

10.7 Sales Variances

10.8 Control of Variances

10.9 Variance Reporting

10.10 Summary

10.11 Key Words

10.12 Self-assessment Questions/Exercises

10.13 Further Readings

10.1 INTRODUCTION

Profit making is the prime objective of business enterprise. Profit depends basically on two factors-Costs and Sales. In order to achieve better performance, it is necessary that you lay down your targets in respect of both of them. Your objective should e to maximise the sales and minimise the costs. This will result in maximisation of the profits and, in the long run the wealth of the firm.

Variance analysis is intimately connected with budgetary control which helps the management in:

- planning future activities
- comparing actual performance with the budgeted performance
- identifying the variances as to their causes
- ensuring that remedial measures are taken at appropriate time.

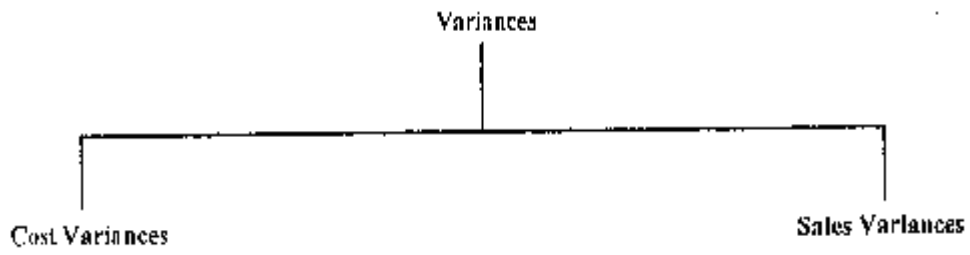
10.2 MEANING OF VARIANCE

Variance is the difference between budgeted and the actual level of activity. Since, as explained earlier, profitability of a business depends both on costs and sales, it will be

Cost variance is the difference between ` what should have been the cost' (popularly termed as standard cost) and `what has been the cost ` (i.e. actual cost). In case the actual costs is less than the standard cost, the variance is termed as `favourable'. However, if the actual cost is more than the standard costs, variance is termed as `adverse' or `unfavourable'.

Sales variance is the difference between `what should have been the sales' (popularly) termed as Budgeted sales) and `what have been the sales ` (i.e. the actual sales). In case the amount of actual sales is more than the budgeted sales, the variance is termed as 'favourable'. However, if the amount of actual sales is less than the budgeted sales, the variance is termed as `adverse' or `unfavourable'.

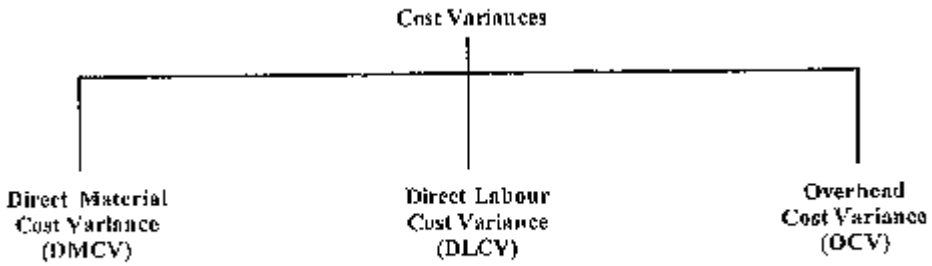
Thus, variances may be classified into two categories:



In the following pages, we will explain both the above types of variances in details.

10.3 COST VARIANCES

Cost variances can be put in the following chart:



Direct expenses constitute an insignificant portion of the total cost of the product. Hence, direct expense variance is generally not calculated. If it is desired to calculate the direct expense variance, it can be computed in the same way as the variable overhead variance is calculated, since in most cases direct expenses are variable.

At this point, however, we suggest that you have a look at Exhibit -10.1, given towards the end of this unit, which presents a bird's eye view of all the variances discussed in this unit and their inter-relationships. Whenever you are in doubt, a reference to this Exhibit may prove helpful.

In the course of discussion in this unit, you will find that abbreviations for different variances have been used. For your facility, we present below a list of all such abbreviations together with the full names of the variances.

Abbreviations for Different Variances

DMCV	-	Direct Material Cost Variance
DMPV	-	Direct Material Price Variance

DLCV	-	Direct Labour Cost Variance
DLRV	-	Direct Labour Rate Variance
DLEV	-	Direct Labour Efficiency Variance
OCV	-	Overhead Cost Variance
VOCV	-	Variable Overhead Cost Variance
FOCV	-	Fixed Overhead Cost Variance
FOEXPV	-	Fixed Overhead Expenditure Variance
FOVV	-	Fixed Overhead Volume Variance
SVV	-	Sales Value Variance
SPV	-	Sales Price Variance
SVOLV	-	Sales Volume Variance

10.4 DIRECT MATERIAL VARIANCES

Three types of direct material variances are explained here. The first one is Direct Material Cost Variance (DMCV) which is equal to the difference between the standard cost of direct materials specified for the output achieved and the actual cost of direct materials used. The standard cost of materials is computed by multiplying the standard price with the standard quantity for actual output, and the actual cost is computed by multiplying actual price with the actual quantity.

Formula for Computation:

Direct Material Total Standard

Cost Variance = Cost for – Total Actual Cost

(DMCV) Actual Output

(Standard Price x Std. Qty. for Actual Output) - (Actual Price x Actual Quantity)

If the actual cost is more than the standard cost, it would result in an adverse variance and *vice-versa.* Let us take an example.

Standard output	800 units
Actual output	1,000 units
Std. qty. per unit	1 kg
Total actual qty. used	1,200 kg.
Std. rate per unit	Rs.4 per kg
Actual rate per unit	Rs. 5 per kg.

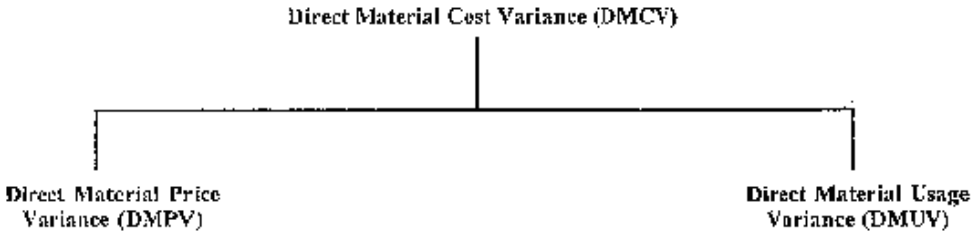
DMCV = Standard Cost for actual output Actual Cost
= 1,000 x 1 x 4-1,200 x 5

= Rs. 4,000 - Rs. 6,000

= Rs. 2,000 (Adverse)

If standard output and actual output are different as in this case, the variances are to be calculated keeping in view the actual output. The information regarding standard output (which is different from standard quantity) is thus not relevant.

The material cost variance may arise either on account of change in price or change in quantity or both. Thus, material cost variance may be further analysed as `material price variance' and `material usage variance'



Direct Material Price Variance

DMPV is concerned with that portion of the direct material cost variance which is due to the difference between the standard price specified and the actual price paid.

Formula for computation

$$\text{Direct Material Price Variance (DMPV)} = \text{Actual Quantity} \times \left[\text{Standard Price} - \text{Actual Price}\right]$$

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

The material price variance, on the basis of figures given in the above example will be computed as follows:

DMPV = 1,200 x (4 - 5)

= Rs. 1,200 (Adverse)

The reasons for price variance may be as under:

i) Fluctuations in market prices:

a) Market trends may be bullish or bearish.

b) Increase or decrease in prices on account of agreement between various suppliers or on account of Government intervention. .

ii) Buying efficiency or inefficiency

iii) High or low costs of transportation and carriage of goods.

iv) Changes in or laxity in pursuing purchase policy:

a) Superior or inferior (non-standard) material might have been purchased;

b) Purchases might have been effected in small quantities instead of in bulk or *vice versa;*

c) Substitute and cheaper materials might have been used.

v) Emergency purchase- placing rush orders for immediate delivery at the prevalent price.

vi) Fraud in purchases and loss of discounts.

vii) Incorrect: setting of standards.

Some of the facts may be controlled by the management if care or proper control is exercised, while others may be beyond the control of management. If the factors are controllable, the buying department is usually answerable for unfavourable variations.

Direct Material Usage or Quantity Variance

DMUV is that portion of direct material cost variance which is due to the difference between the standard quantity specified (for the output achieved) and the actual quantity used.

Formula for computation

$$\text{Direct Material Usage Variance (DMUV)} = \text{Standard Rate} \times [(\text{Standard Quantity for actual output}) - (\text{Actual Quantity})]$$

The actual quantity, if more than the standard quantity, would cause an unfavourable variance and *vice-versa.*

The usage variance will be computed as follows on the basis of figures given in the above example.

DMUV = 4 X (1,000-1,200)

= Rs. 800 (Adverse)

The total of material price and quantity variances is equal to material cost variance.

Thus, DMCV = DMPV + DMUV

= Rs.1200 (A) +800 (A)

= Rs. 2,000 (A)

The reason for direct material usage variance may be as under:

i) Inefficiency, lack of skill or faulty workmanship resulting in more consumption of raw materials.

ii) Lack of proper unkeep and maintenance of plant and equipment, and frequent breakdown during production process leading to wastage of material

iii) Non-consideration of product design and method of processing, etc. which fixing standards.

iv) Incorrect processing of materials resulting in wastages.

v) Non-recording of returns of material to stock (or stores) or inter-transfers from one job to another.

vi) Improper inspection and supervision of workmen resulting in adverse quantity variance due to careless handling and processing.

vii) Too strict supervision or inspection resulting in excessive rejections of materials.

viii) Substitution of specified materials with unspecified materials causing greater consumption of the latter. Price variance could be favourable because unspecified material is likely to be cheaper.

ix) Incorrect setting of standards, leading to variations.

x) Excessive wastage, scrap, Spoilage, Shrinkage, leakage, etc. causing an adverse usage variance.

Computation of Various Direct Material Variances

Illustration 10.1

Form the following particulars, let us find the(i) Material Cost Variance, (ii) Material. Usage Variance, (iii) Material Price Variance.

Quantity of material purchased	4,000 units
Value of material purchased	Rs.10,000
Standard quantity of materials per unit of finished product	2 kg
Standard rate of material	Rs.2 per kg
Opening stock of material	1,000 kg
Closing stock of material	2,000 kg
Finished products during the period	1;000 units

Standard Quantity of materials required : 1,000 x 2 = 2,000 kg.

Actual Qty. of Material used = Material purchased + Opening Stock - Closing Stock

= 4,000+1,000-2,000 = 3,000 kg.

Standard Price = Rs. 2 per unit.

Actual Price = $\frac{\text{Rs.10,000}}{\text{4,000 units}}$ = Rs.2.50 per unit.

i) DMCV = Total Standard Cost–Total Actual Cost

$$\left[\begin{matrix}\text{Standard}\\\text{Price}\end{matrix} \times \begin{matrix}\text{Standard}\\\text{Quantity}\end{matrix}\right] - \left[\begin{matrix}\text{Actual}\\\text{Price}\end{matrix} \times \begin{matrix}\text{Actual}\\\text{Quantity}\end{matrix}\right]$$

$$= (2 \times 2{,}000) - (2 \times 1{,}000 + 2.50 \times 2{,}000)$$

$$= \text{Rs. } 4{,}000 - \text{Rs.}7{,}000 = \text{Rs.}3{,}000 \text{ (Adverse)}$$

*Presuming FIFO Method

ii) DMUV = Standard Price x (Standard Quantity - Actual Quantity)

= Rs. 2 x (2,000 - 3,000)

= Rs. 2 x (-1,000) = Rs. 2,000 (Adverse)

iii) DMPV = Actual Quantity x (Standard Price - Actual Price)

= 1,000 x (2 - 2) + 2,000 x (2 - 2.50) = Rs. 1,000 (Adverse)

It will be observed that the total of materials usage and material price variance is equal to material cost variance.

Activity 10.1

Calculate: (i) material usage variance, (ii) material price variance, and (iii) material cost variance in respect of a manufacturing concern which has adopted standard costing. The firm furnishes the following information.

Standard data

Material for 100kg.of finished products (140 kg),

Price of materials Rs. 4 per kg

Actual data

Output	60,000 kg
Material used	80,000 kg
Cost of material	Rs. 2,60,000

10.5 DIRECT LABOUR VARIANCES

The deviations in cost of direct labour may occur because of two main factors: (1) difference in actual rates and standard rates of labour, and (ii) the variation in actual time taken by workers and the standard item prescribed for performing a j( ) or an operation.

Labour variances are very much similar to material variances and they can be very easily calculated by applying the same techniques as used in calculation of mater .1 variances. (The readers can work out the various formulae for Direct Labour Variances by simply putting the word `time' in place of `qty'. in the formula meant for Direct Material Variances.) The various labour variances may be put as under.

It is the difference between the standard direct wages specified for the activity achieved and the actual direct wages paid. Formula for computation.

$$\text{Direct Labour Cost Variance} = \text{Standard Cost for Actual output} - \text{Actual Cost}$$

OR

$$\text{DLCV} = \left[\text{Standard Rate} \times \text{Std. Time for actual output}\right] - \left[\text{Actual Rate} \times \text{Actual Time}\right]$$

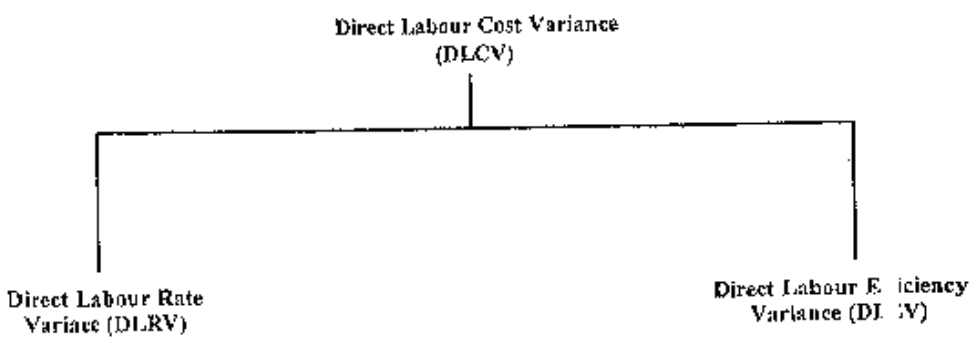
Illustration 10.2

Standard output	200 units
Standard time per unit	2 hours
Standard rate per hour	Rs. 3
Actual output	160 units
Total actual time taken	300 hours
Actual rate per hour	Rs.3.50

DLCV = Rs. 3 x 160 x 2 - Rs. 3.50 x 300

= Rs. 960 - 1,050 = Rs. 90 (Adverse)

The direct labour cost variance may arise on account of difference in either rate of wages or time. Thus, it may be further analysed as (i) Rate variance, and (ii) Ti e or Efficiency variance. This has been shown in the chart below:



Direct Labour (Wages) Rate Variance

It is that portion of direct labour (wages) variance which is due to the difference between the standard or specified rate of pay and actual rate paid. Formula for computation.

Direct Labour Rate = Actual time x (Standard Rate - Actual Rate)

Variance (DLRV)

If the actual rate is higher than the standard rate, it shall result in an unfavourable variance and vice versa.

Taking the figures given in the above illustration, the direct labour rate variance will

be computed as follows:

DLRV = 300 hrs x (Rs. 3 - Rs. 3.50)
= Rs.150 (Adverse)

The reasons for direct labour rate variance may be as under:

i) Deployment of more efficient and skilled workers giving rise to higher payment.

ii) Higher payment due to shortage of availability of labour.

iii) Lesser payment due to abundant availability of labour or high competition among them for employment.

iv) Employment of unskilled labourers causing lower actual rates of pay.

v) Extra-Shift allowance to workers or overtime allowance (for work done after normal hours) leading to higher wages.

vi) Higher piece rates for better quality production

vii) Change in the system of wage payment(from time wages to piece wages or vice versa , introduction or withdrawal or incentive or bonus schemes etc.

viii) Change in wage rates, probably due to a revised agreement with labour union/

ix) Higher rates during seasonal or emergency operations

Direct Labour Efficiency (Time) Variance

It is that portion of the direct labour variance which is due to the difference between the standard labour hours specified for the activity achieved and the actual. labour hours expended.

Formula for computation

Labour Efficiency = Standard Rates x Standard time – Actual time

Variance (for actual output)

Taking the figures given in Illustration 10.2, the labour efficiency variance will be computed as follows:

Labour Efficiency Variance = Rs. 3 x (320 hrs -300 hrs). = Rs.60 (Favourable)

It will be seen that the work has been finished in 150 hours, compared to 160 hours- the standard time set for the production. This could be attributed to efficiency of workers. That is why, this variance is known as Labour Efficiency Variance. The total of labour rate and efficiency variance is equal to labour cost variance.

Verification

DLCV = Labour Rate Variance + Labour Efficiency Variance

= Rs. 150'(A) + 60 (F)

= Rs. 90 (Adverse)

Labour efficiency variance may be caused by the following:

i) Defective or bad materials

ii) Breakdown of plant and machinery

iii) Failure of power

iv) Efficient working by the labourers and fuller utilisation of time due to incentives given.

v) Loss of time due to delayed instructions from management or delay in receipt pf raw materials.

vi) Alteration in the method of production.

vii) More time taken by workers due to lack of proper supervision and control by management, making the workers lazy and inefficient.

viii) Too rigid a system of inspection and control.

ix) Poor working conditions

x) Lower productivity due to lack of training, ability or experience on the part of workers

xi) Labour turnover or change -over of workers form one operation or process c department to another.

Computation of Labour Variances

Illustration 10.3

Form the following details calculate the direct labour variances:

Direct Labour Rate	:	Re. 1 per hour
Hours set per unit	:	10 hours
Actual data are given below:		
Units produced	:	500
Hours worked	:	6,000
Actual Direct Labour Cost	:	4,800

Let us work out the various labour variances.

Standard Time = 10 hours x 500 units = 5,000 hours

Standard Cost = Standard Rate x Standard Time

= Re.1 x 5,000 hours = Rs.5,000

i) Direct Labour Cost Variance (DLCV) = Standard Cost - Actual Cost

= Rs.5,000 - Rs.4,800 = **Rs.** 200 (F)

ii) Direct Labour Rate Variance (DLRC) = Actual Time X (Standard Rate -Actual Rate)

$$\text{Actual Rate} = \frac{\text{Actual Cost}}{\text{Actual hours worked}}$$

$$= \frac{\text{Rs. } 4{,}8000}{6{,}000} = 80 \text{ paise per hour.}$$

Hence, Labour Rate Variance = 6,000 hours x (Rs. 1.80 p.)

= Rs. 1,200 (F)

iii) Direct Labour Efficiency Variance (DLEV). = Standard Rate x (Standard Time – Actual Time)

= Re.1 x (5,000 - 6,000 hours)

= 1,000 (Adverse)

Verification

DLCV = DLRV + DLEV

= Rs. 1,200 (F) + Rs. 1,000 (A)

= Rs. 200 (Favourable)

Activity 10.2

Calculate labour variances for Travancore Supply Company which produces a single article. The product goes through two operating departments. The standard costs card for this article indicated the following data:

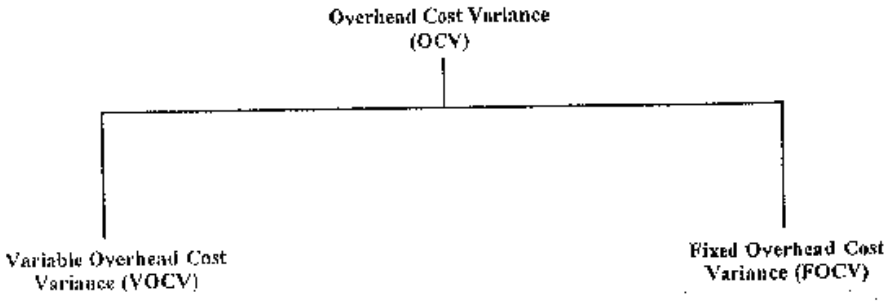
	Standard time	Standard rate	Total
Department **A**	2 hours	Rs.5	Rs.10
Department **B**	1.5 hours	Rs.6.00	Rs.9

The production for the month of July was, 2,000 units. The actual labour costs in the two departments were:

	Hours	Cost
Department **A**	4,000	Rs. 24,000
Department **B**	2,000	Rs. 15,000

10.6 OVERHEAD VARIANCES

The term overhead includes indirect material, indirect labour and indirect expenses. Overheads may relate to factory, office, or selling and distribution departments. However, for the purposes of variance analysis, we can broadly divide the overhead cost variance into two categories as shown below:



Each of these variances are discussed below:

Overhead Cost Variance (OCV)

It is the difference between the standard overheads for actual output (i.e. recovered overheads) and actual overheads. It is the total of both fixed and variable overhead variances.

Overhead Cost variance = Recovered Overheads - Actual Overheads **Variable Overhead**

Cost Variance (VOCV)

It is the difference between standard variable overheads for actual output (or recovered variable overheads) and actual variable overheads.

VOCV = Recovered Variable Overheads - Actual Variable Overheads.

Causes of variance : This variance may be due to advance payment of expenses, or

outstanding expenses or payment of past outstanding expenses during this period, or on account of certain abnormal expenses incurred such as, repairs of machinery due to breakdown, expenses clue to spoilage or defective workmanship or excessive overtime work, etc.

Fixed Overhead Cost Variance (FOCV)

It is the difference between standard fixed overheads for actual output (or Recovered Overheads) and actual fixed overheads.

FOCV = Recovered Fixed Overheads - Actual Fixed Overheads

Causes of variance : Difference between actual and recovered. fixed overheads ma;

be on account. (i) a higher or lower amount of fixed overheads, compared to budge :d fixed overheads, might have been incurred for the same production during the same period (ii) the same amount of fixed overheads might have been incurred for a high or lower production than the budgeted production during the same period.

Computation of Overhead Variances

Illustration

Budgeted Output	10,000 units
Budgeted Overheads	Rs. 10,000
Fixed	6,000
Variable	4,000
Actual Overheads	12,000
Fixed	6,000
Variable	6,000
Actual output	8,000 units

Let us calculate the various overhead variances.

It will be appropriate to make the following basic calculations before computing th various Overhead Variances.

$$\text{Standard/Budgeted Overhead Rate per Unit} = \frac{\text{Budgeted Overheads}}{\text{Budged Output}}$$

$$\frac{\text{Rs. } 10,000}{} = \text{Re.}1$$

$$= \quad 10,000$$

$$\text{Standard/Budgeted Fixed Overhead Rate per Unit} = \frac{\text{Budgeted Fixed Overheads}}{\text{Budged Output}}$$

$$= \frac{\text{Rs. } 6,000}{10,000} = \text{Re. } 60$$

$$\text{Standard/Budgeted Variable Overhead Rate per unit} = \frac{\text{Budgeted Variable Overheads}}{\text{Budged Output}}$$

$$= \frac{\text{Rs. } 4,000}{10,000} = \text{Re. } 0.40$$

Various Overhead Variances can now be calculated

OCV = Recovered Overheads - Actual Overheads

= Rs. 1 x 8,000 -12,000 = 4,000 (Adverse)

VOCV = Recovered Variable Overheads -Actual Variable Overheads

= 8,000 x Re. 0,40 - Rs. 6,000

= 3,200 = 6,000

= 2,800 (Adverse)

FOCV = Recoverd Fixed Overheads Actual Fixed Overheads

= 8,000 x Re. 0.60 - Rs. 6,000

= Rs. 4,800 - Rs. 6,000 = Rs. 1,200 (Adverse)

Verification

OVC = VOCV + FOCV

4,000 (A) = 2,800 (A) + 1,200 (A)

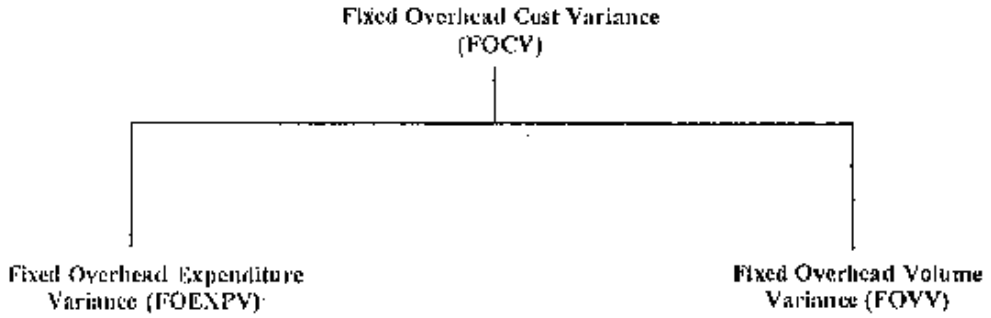
Activity 10.3

Calculate different overhead variances from the following standard and actual data:

Standard Overhead rate:	Per unit	
Variable	Rs. 3.00	
Fixed (Rs. 36,000 / 3,000)	Rs. 12.00	
	Rs. 15.00	
Actual data during the period:		
Output	2,400 units	
Overhead:		
Variable	Rs. 6,000	
Fixed	Rs. 28,000	Rs. 34,000

Classification of Fixed Overhead Variance

Fixed Overhead Variance may be classified as shown in the following chart:



Fixed Overhead Expenditure or Budget or Controllable Variance (FOEXPV)

This variance is due to the difference between Budgeted Fixed Overheads and the Actual Fixed Overheads incurred.

FOEXPV = Budgeted Fixed Overheads-Actual Fixed Overheads

Fixed Overhead Volume Variance (FOVV)

This variance arises on account of difference between standard and actual output resulting in under or over-recovery of fixed overheads. It is, therefore, the difference between overheads absorbed on actual output (or recovered overheads) and those on budgeted output (or budgeted overheads).

FOVV = Recovered Fixed Overheads Budgeted Fixed Overheads.

Illustration 10.5

Calculate the Fixed Overhead Expenditure Variance and Fixed Overhead Volume Variance on the basis of data given in Illustration 10.3.

FOEXPV = Budgeted Fixed Overheads -Actual Fixed Overheads

= Rs. 6,000 - Rs. 6,000 = Nil

FOVV = Recovered Fixed Overheads - Budgeted Fixed Overheads

= Rs. 4,800 - Rs 6,000 = Rs. 1,200 (Adverse)

Verification

FOCV = FOEXPV + FOVV

1,200 (A) = Nil + 1,200 (A)

Activity 10.4

Caren late the overhead variance with the following data:

Item	Budgeted	Actual
No. of working days in a month	20	2
Man hours per day	6.000	6.400
Output per man hour in units	1.0	9
Overhead cost (Rs.)	1,20,000	1,28,000

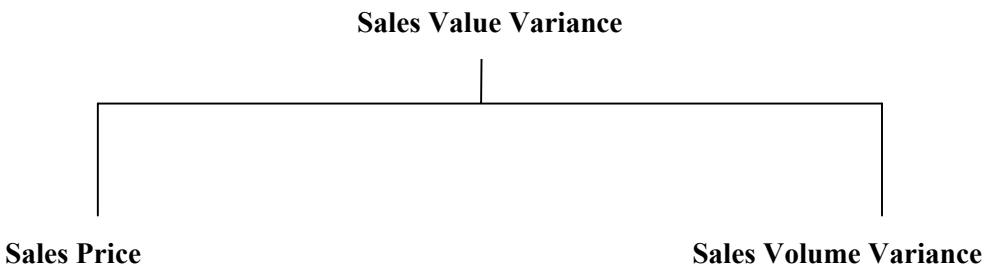
10.7 SALES VARIANCES

Sales are affected by two factors (i) the selling price and (ii) the quantum of sales fhe variations in the standards set and actuals for the purpose may be mainly due to change in market trends. Normally, if the selling price increases, the volume of sales will be lower than the standard. It may result in a favourable variance as to price Id

unfavourable variance as to quantity. It is to be borne in mind that higher price here is to be viewed as a favourable variance (higher price paid for material, it will be recalled, causes an adverse variance) and lower volume of sales is to be viewed a unfavourable (in case of materials, it is the other way around, i.e. lower usage of materials than the standard causes a favourable variance).

It is well known that demand and supply position in the market decides the quantity of sales as well as the selling price. The variations may be on account of control lab : as well as non-controllable factors. changes in market conditions and demand by customers¬ are, of course, beyond the control of management, but certain factors like urn ably high prices are controllable, and an effort should be made to check adverse variations due to these factors.

Sales variances can be understood with the help of the following chart



Sales Value Variance

The difference between budgeted sales and actual sales results in Sales Value < xi-ance. The Formula is:

Sales Value Variance = Budgeted Sales - Actual Sales

If actual sales are more than the budgeted sales, a favourable variance would ' *reported* and vice versa.

The difference in value may be on account of difference in price or volume of ales which is therefore analysed further.

Sales Price Variance

It can be calculated like material price variance. It is on account of the difference in actual selling price and the standard selling price for actual quantity of sales. The formula is:

Actual quantity sold X (Standard Price - Actual Price)
OR

Price Variance = Standard Sales - Actual Sales

Sales Volume Variance

It can be calculated like material usage variance. Budgeted sales may be different from the standard sales. In other words, budgeted quantity of sales at standard price may vary from the actual quantity of sales at standard prices. Thus, the variance is a result of difference in budgeted and actual quantities of goods sold. The formula is:

Standard Price X (Budgeted Quantity - Actual Quantity)

OR

Volume Variance = Budgeted Sales - Standard Sales

If the standard sales are more than the budgeted sales, it would cause a favourable variance and vice versa?

The total of price and volume variances would be equal to sales value variance.

Computation of Sales Variances

Illustration 10.6

The budgeted and actual sales of a firm, manufacturing and marketing a sir product, are furnished below:

Budgeted sales	10,000 units at Rs. 6 per unit
Actual sales	5,000 units at Rs. 4 per unit.
	8,000 units at Rs. 5 per unit

Let us calculate : a) Sales price variance,
b) Sales volume variance, and
c) Sales value variance

a) Sales Price Variance = Standard Sales – Actual Sales

Standard Sales = Standard price × Actual Quantity
= Rs. 6 × 13,000
= Rs. 78,000

Actual Sales = Actual price × Actual quantity
= Rs. 4 × 5,000 + Rs. 5 × 8,000
= Rs. 20,000 + Rs. 40,000
= Rs. 60,000

F ice, Sales Price Variance = Rs. 78,000 – Rs. 60,000
= Rs. 18,000 (Adverse)

b) Sales volume variance = Budgeted sales – Standard sales
= Rs. 60,000 – Rs. 78,000
= Rs. 18,000 (Favourable)

c) Sales value variance = Budgeted Sales* – Actual Sales
= Rs. 60,000 – Rs. 60,000
= Rs. Nil

Verification

Sales value variance	=	Sales Price Variance + Sales Volume Variance
	=	18,000 (A) + 18,000 (F)
	=	Nil

*Budgeted Sales = Budgeted Price x Budgeted Quantity

10.8 CONTROL OF VARIANCES

After the variance have been computed and analysed, the next logical step for the management is to trace the responsibility for the variances to particular individuals or departments. The Management/Cost Accountant may be required to prepare necessary report for this purpose. The report submitted to the management should clearly indicate where action is required. On the basis of this report, the management will try to identify the specific individuals for adverse controllable variances, which being within their control could have been avoided. It was earlier mentioned that certain factors, such as changes in market conditions, demand and supply position, etc. are beyond the control of managers. Hence, action to pinpoint responsibility of such uncontrollable variances is not called for.

In case of controllable variances, the responsibility could be traced as shown below to the different departments for different variances.

Variance		Department to be held responsible
Materials		
Price		Purchasing Department
Quantity or Grade		Stores, Purchase or Process Departmen as the case may be.
Waste, scrap or spoilage		Production Department (for lack of proper supervision)
Wages		
Rate —	For difference in rates for work requiring higher rates of pay	Personnel Department Production Department
Time —	lack of proper supervision	Production Department
Overheads		
Volume		Sales Department
Efficiency		Production Department
Expenditure:		
higher rates of indirect workers		Personnel Department
higher prices of indirect materials		Purchasing Department
higher consumption of indirect materials		Production Department
Excessive expenditure in factory		Production Department
Excessive expenditure for selling and distribution		Selling Department
Sales		
Price and Volume		Selling Department

It may be noted that variance analysis, in itself, would not help in achieving the desired objective of in minimising costs, unless managerial action is prompt and is in the right direction. The direction, of course, shall be indicated by the analysis of variances, but it is the executive side which would be responsible for taking immediate action, exercising proper control, having a close watch over operations, etc., so that economies may be effected inefficiencies minimised and performance improved. A continuous and rigorous effort in the direction of cost control would help the management to achieve the goal of standard costing.

10.9 VARIANCE REPORTING

As stated above, the deviations alongwith their causes should be reported to the management regularly and at the opportune time so that corrective action may be taken immediately. The person or department may be held responsible for any adverse variations after duly accounting for it.

The information as to the profit earned by the business is presented through a simple Profit and Loss Account where a system of historical costing is prevalent. Its proforma is given below:

Trading and Profit and Loss Account
For the Year ending

To Direct Materials	...	By Sales	….
" Variable Expenses	…		
" Fixed Expenses	…		
" Net Profit	…		

However, when a system of standard costing is in operation the information about the standards, the actual and the variances alongwith their causes should be depicted through a statement, so that the management may be able to take quick action in respect of any inefficiencies thus revealed. The statement draws a reconciliation between the Budgeted Profit/Standard Profit and Actual Profit. The preparation of this statement can be understood with the help of the following

The profit statement, submitted to the management, should contain notes to explain the causes of the variances. Since the rule of `management by exception' is followed, greater attention in the reported statement is drawn towards the adverse variances, i.e, the reasons for the failure or poor performance are highlighted in particular, alongwith comments on general overall performance.

Illustration 10.7

From the following particulars let us try to draw a reconciliation between actual and the budgeted profit explaining the variances due to the various causes:

	Budgeted /Standards	Actual
Units	4,000	3,500
Net price per unit	Rs.20.00	21.00
Material per unit	Kgs. 4.00	4.00
Rate of material per Kg.	Rs. 2.00	2.25
Labour hours per unit	Hrs. 5.50	4.50
Rate per labour hour	Re. 0.50	0.60
Variable overhead per labour hour	Rs. 0.80	1.00
Fixed overhead per unit	Re. 1.00	1.20

Direct Material Price = Actual qty. x (Std. price - Actual price)

Variance (DMPV) = 14,000 x (Rs. 2.00 - Rs. 2.25)

= Rs. 3,500 (Adverse)

Direct Material usage Variance (DMUV)	= Std. price × (Std. Qty. for actual output - Actual Qty.)
Std. Qty. for actual output	= 3,500 × 4 Kg. = 14,000 Kgs.
Usage Variance	= Rs. 2× (14,000 - 14,000) = Nil
Direct Material Cost Variance (DMCV)	= Standard cost - Actual cost = Rs. 2 × 14,000 - Rs. 2.25 × 14,000 = 28,000 - Rs. 31,500 = Rs. 3,500 (Adverse)
Direct Labour Rate Variance (DLRV)	= Actual time × (Std. Rate - Actual Rate) = 15,750 hours × (0.50 - 0.60) = Rs. 1,575 (Adverse)
Actual time	= Actual hours per unit × Actual output = 4.50 × 3,500 = 15,750 hours.
Direct Labour Efficiency Variance (DLEV)	= Std. rate × (Std. time - Actual time) = Re. 0.50 × (19,250 - 15,750) = Rs. 1,750 (Favourable)
Std. time of actual output	= Std. hours per unit × Actual output = 5.50 × 3,500 = 19,250 hours
Direct Labour Cost Variance (DLCV)	= Standard Cost - Actual Cost = (Re. 0.50 × 19,250) - (Re. 0.60 × 15,750) = Rs. 9,625 - 9,450 = Rs. 175 (Favourable)
Variable Overhead Cost Variance (VOCV)	= Recovered Variable Overhead - Actual Variable Overheads = Rs. 15,400 - Rs. 15,750 = Rs. 350 (Adverse)
Recovered Variable Overheads	= Standard rate per hour × Standard hours for actual output = Re.0.80 × 19,250 = Rs. 15,400
Actual Variable Overheads	= Re. 1× 15,750 = Rs. 15,750
Fixed Overhead Expenditure Variance (FOEXPV)	= Budgeted Fixed Overheads - Actual Fixed Overheads = Rs. 4,000 - Rs. 4,200 = Rs. 200 (Adverse)
Budgeted Fixed Overheads	= Std. fixed overheads per unit × Budgeted output = Re. 1.00 × 4,000 = Rs. 4,000
Actual Fixed Overheads	= Actual rate per unit × Actual output = Re. 1.20 × 3,500 = Rs. 4,200
Fixed Overhead Volume Variance (FOVV)	= Recovered Fixed Overheads - Budgeted Fixed Overheads = Rs. 3,500–Rs. 4,000 = Rs. 500 (Adverse)
Recovered Fixed Overhead	= Std. rate per unit × Actual output = Re. 1 × 3,500 = Rs. 3,500
Fixed Overhead Cost Variance(FOCV)	= Recovered Fixed Overheads - Actual Fixed Overheads = Rs. 3,500 - 4,200 = Rs. 700 (Adverse)
Sales Price Variance (SPV)	= Act. qty. sold × (Std. price – Actual Price) = Rs. 3500 × (20 – 21) = Rs. 3,500 (Favourable)

Sales Volume Variance (SVOLV)	= Std. price × (Budg. Qty. - Actual Qty.)
	= Rs. 20 × (4000 - 3500)
	= Rs. 10,000 (Adverse)
Sales Value Variance (SVV)	= Budgeted Sales - Actual Sales
	= Rs. 20 × 4,000 - Rs. 21 × 3,500
	= 80,000 - 73,500
	= Rs. 6,500 (Adverse)

Variance with reference to profit

Standard cost per unit	= Rs. 8 + Rs. 2.75 + Rs., 4.40 + Re. 1
	= Rs. 16.15
Standard Profit per unit	= Std. selling price per unit–Std. cost per unit
	= Rs. 20,00 - Rs. 16.15= Rs. 3.85
Actual cost per unit	= Rs. 9 + Rs. 2.70 + Rs. 4.50 + Rs. 1.20
	= Rs. 17.40
Actual Profit per unit	= Actual selling price per unit - Actual cost per unit
	= Rs. 21.00 - Rs. 17.40 = Rs. 3.60 per unit
Budgeted Profit	= Budgeted quantity of sales × Standard profit per unit
	= Rs. 4,000 × Rs. 3.85 = Rs. 15,400
Actual Profit	= Actual quantity of sales x Actual profit per unit
	= 3,500 x Rs. 3.60 = Rs. 12,600
Value Variance	= Budgeted profit - Actual profit
	= Rs. 15,400 - Rs. 12,600
	= Rs. 2,800 (Adverse)
Price Variance	= Actual qty. sold × (Std. profit per unit - Actual profit per unit)
	= 3,500 × (Rs. 3.85–Rs. 3.60)
	= Rs. 875 (Adverse)
Volume Variance	= Standard profit per unit x (Standard Quantity – Actual Qty.)
	= Rs. 3.85 × (4,000 – 3,500)
	= Rs. 1,925 (Adverse)

Profit and Loss Statement

For the year ending on .....

Budgeted Sales (4,000 × Rs. 20)		Rs. 80,000	
Less: Budgeted cost of sales (4,000 × 16.15)		Rs. 64,600	
Budgeted profit		Rs. 15,400	
Cost Variance:			
DMCV			
DMPV	3,500(A)		
DMUV	Nil	3,500 (A)	
DLCV			
DLRV	1,575 (A)		
DLEV	1,750 (F)	175 (F)	
OCV			
FOCV	700 (A)		
VOCV	350 (A)	1,050 (A)	
Sales Variances:			
Sales Price Variance		3,500 (F)	
Profit variance due to variance in sales volume		1,925 (A)	2,800 (A)
Actual Profit			12,600

Activity 10.5

From the following details, reconcile the budgeted sales with actual sales and standard profit with actual profit in terms of variances:

From the following details, reconcile the budgeted sales with actual sales and standard profit with actual profit in terms of variances:

	Quantity (units)	*Standard selling Price Rs.*	*Cost Rs.*	*Quantity (units)*	*Actual Selling price Rs.*	*Cost Rs.*
Product A	3,000	22	12	4,000	20	13
Product B	5,000	16	10	3,500	18	9

Activity 10.6

Identify the type of variance which will result in each of the stated situations and also indicate whether the variance is favourable or unfavourable:

- Jammnadas, a worker in the finishing department of a furniture factory,has gone on leave due to illness and is temporarily replaced by Gangaram. Jamanadas's wages are Rs. 200 per day whereas Ganga is to be paid at Rs. 220 per day.
- Because of the machining error, the cutting department got only three table tops from each piece of a teak board. Proper cutting should have resulted in four table tops per sheet of teak board.
- Installation of a new office equipment reduced factory office cost by Rs. 1,00,000 a month.
- The price of teak board increased by 5 per cent. This price increase was anticipated and was included in the computation of standard material cost.
- A shipment of lumber from Assam is delayed in transit because of transporters' strike. As a result, it is necessary to substitute a more expensive type of lumber.
- The standard time for shaping legs is 16 minutes per table. A new manwas assigned to this operation and while he was learning the job, his production rate was three table legs every 21 minutes.
- The production level in 2002 was 22 per cent higher than estimated at the beginning of the year, while total fixed manufacturing overhead costs were as budgeted.

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10.10 SUMMARY

Profitability of a business enterprise depends basically on two factors; costs and sales. The efforts of the management should be to minimise the cost without compromising on the quality and pushing up the sales of the products. This requires proper monitoring of both costs and sales performance. Targets have to be fixed and the actual results should be compared with the pre-determined targets and variances found out.

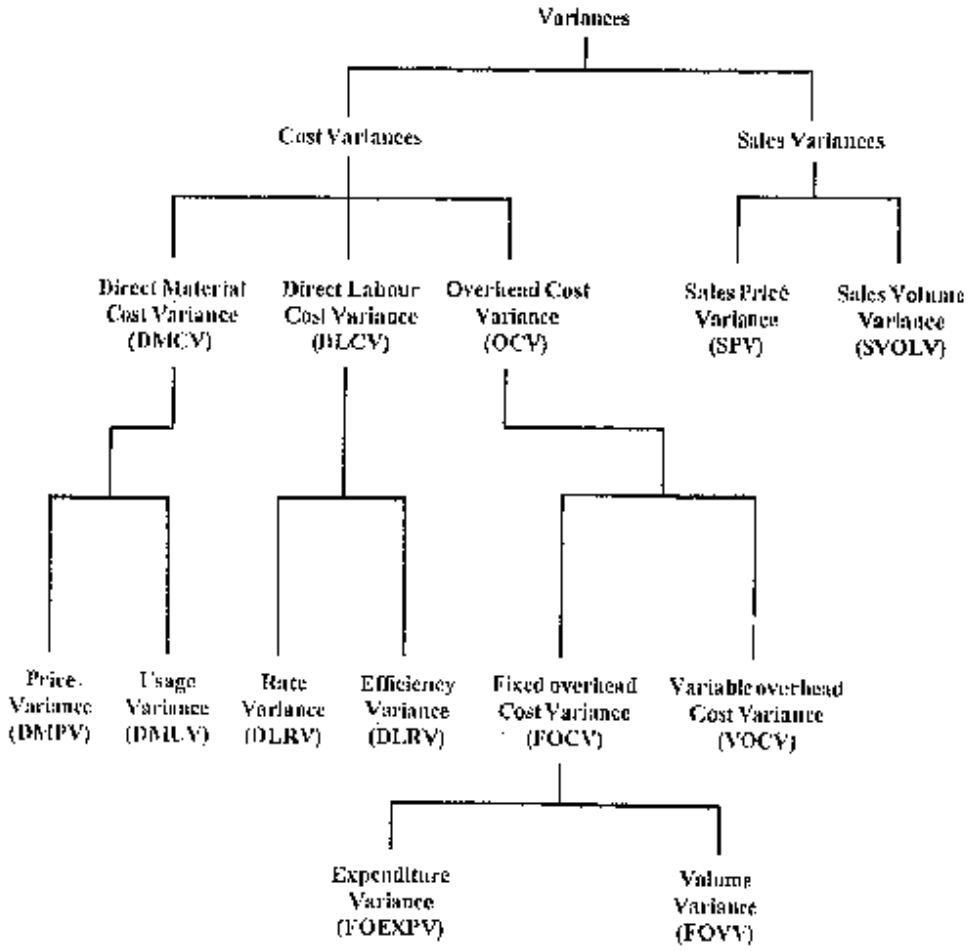
Variance refers to the difference between the standard (or budgeted performance) and actual performance. Variance analysis is mainly concerned with ascertaining the quantum of variances together with the analysis of the causes responsible for such variances.

It may be noted that in the case of cost variance, if the actual cost is more than the standard cost, it is termed as an adverse variance. While in the case of sales variances, if the actual amount of sales is more than the budgeted sales, it is termed as a favourable variance.

Variance reports have to be submitted to the management from time to time. These reports contain details regarding the budgeted/standard performance, actual performance, the quantum of variances and the departments/executives responsible for adverse variances. On the basis of these reports, the management can fix the responsibilities on the executives for controllable variances, and takes necessary steps so that such variances do not occur in future. For variances caused by uncontrollable factors, management should try its best to minimise the effect of such factor or revise budgeted/standard performance, if necessary.

Various types of variances can be understood with the help of Exhibit 10.1

Exhibit 10.1: A diagrammatic presentation of variances and their Inter-relationships.



10.11 KEYWORDS

Direct Labour Cost Variance: It is the difference between the direct wages specified or the activity achieved and the actual wages paid.

Direct Labour Efficiency Variance: It is that portion of direct labour cost variance which is due to the difference between the standard labour hours specified for the activity achieved and the actual labour hours expended.

Direct Labour Rate Variance: It is that portion of direct Labour Cost Variance which is due to the difference between the standard rate of wage specified and actual rate paid.

Direct Material Cost Variance: It is the difference between the standard cost of direct materials specified for the output achieved and the actual cost of direct material used.

Direct Material Price Variance : It is that portion of the direct material cost variance which is due to difference between the standard price specified and actual price paid.

Direct Material Usage Variance: It is that portion of the direct material cost variance which is due to difference between the standard quantity specified (for the output achieved) and the actual quantity used.

Fixed Overhead Cost Variance: It is the difference between recovered fixed overheads (i.e. standard fixed overheads for actual output) and the actual fixed overheads.

Fixed Overhead Expenditure Variance: It is the variance due to the difference between budgeted fixed overheads and the actual fixed overheads incurred.

Fixed Overhead Volume Variance: It is the variance due to the difference between recovered overheads (i.e. standard overheads for actual output) and the budgeted overheads.

Over head Cost Variance: It is the difference between recovered overheads (i.e. standard overheads for actual output) and the actual overheads.

Sales Price Variance: It is the variance on account of difference between actual selling price and standard selling price for actual quantum of sales.

Sales Value Variance: It is the difference between the budgeted sales and the actual sales.

Sales Volume Variance: It is the variance on account of difference between budgeted and actual quantity of goods sold at standard price.

Variance: It is the difference between the standard/budgeted performance and the actual performance.

Variable Overhead Cost Variance: It is the difference between recovered variable overheads (i.e. standard variable overheads for actual output) and the actual variable overheads.

10.12 SELF-ASSESSMENT QUESTIONS/EXERCISES

1 What is a Variance? Why are the variances computed?

2 How can the Variance be controlled?

3 List some possible causes, separately for “material price variance” and “material usage variance"

4 What is Direct Labour Efficiency (Time) Variance? What the managers or supervisors can (or should) do to ensure that their is no such unfavourable Variance?

5 Distinguish between Variable Overhead Cost Variance and Fixed Overhead Cost Variance. Why such variances are caused?

6 Discuss the importance of variance analysis in operational and management control. How does this technique help in, what is popularly known as management by exception’?

7 State whether each of the following statements is "True or False" :

a) A cost variance is said to be favourable if the standard cost is more than the actual cost. ☐ True ☐ False

b) Material usage variance is that portion of material cost variance which arises due to the difference between standard quantity for the output achieved and the actual quantity. ☐ True ☐ False

c) Labour efficiency variance is the difference between standard hours for the actual output and the actual hours. ☐ True ☐ False

d) Direct labour rate variance is the difference between the standard direct wages specified for the activity achieved and the actual direct wages paid. ☐ True ☐ False

e) Standard sales and budgeted sales are synonymous terms. ☐ True ☐ False

f) Recovered overheads and absorbed overheads mean one and the same thing. ☐ True ☐ False

g) Fixed overhead cost variance is the aggregate of the expenditure variance and the volume variance. ☐ True ☐ False

h) The selling department is responsible for factory overhead volume variance. ☐ True ☐ False

8 Fill in the blanks:

a) Variance analysis involves……..and ……... of variance.

b) Variance is the difference between standard performance and the …… performance.

c) Material cost variance is sub-divided into …….. variance and …….. Variance.

d) Overhead cost variance can be classified into ……..…….. overhead cost variance and ……..….. overhead cost variance.

e) Sales value variance is the difference between …...…… sales and ……..… sales.

9 From the following particulars, compute Direct Material Variances:

Quantity of direct materials, consumed	2,500 kgs.
Actual rate of material purchased	Rs. 3 per kg.
Standard quantity of materials required per tonne of output	30 kg.
Standard rate of material	Rs. 2.50 per kg.
Output during the period	80 tonnes.

10 XYZ Ltd., which has opted standard costing, furnishes you the following information:

Standard:

Material for 700 units of Finished products	1,000 Kgs.
Price of materials	Re. 1 per kg.

Actual:

Output	2,10,000 units
Opening Stock	Nil

Purchases	3,00,000 kg. For Rs. 2,70,000
Closing stock	20,000 kgs.

You are require to calculate

(a) Direct Material Usage Variance, (b) Direct Material Price Variance and
(c) Direct Material Cost Variance.

11 In a production department of a factory there are 80 workers and the average arte of wages per worker is Re. 1 per hour. Standard working hours per week are 45 and the standard performance is six units per hour.

12 The following information is gathered from the labour records of Bajaj Electrical for January 2003.

Pay roll allocation for direct labour Rs. 40,000

Time card analysis shows that 8,000 hours were worked on production lines. Production reports for the period showed that 2,000 units have been completed, each unit requiring standard labour time of 3 hours and a standard labour rate f Rs. 4 per hour.

Calculate the labour variances.

13 Basu Industries turns out only one article the prime cost standards for which have been established as follows

	Total
Materials – 5lbs. @ Rs. 4.20	Rs. 21
Labour – 2 hours @ Rs. 3	Rs. 6

The production schedule for the month of July, 2003 required completion of 5,000 pieces. However, 5,120 pieces were actually completed. Purchases for the month of July 2003 amounted to 30,000 lbs. of material at the total invoice price Rs. 1,35,000.

Production records for the moth of July 2003 showed the following actual results:

Material used	25,700 lbs.
Direct labour – 15,150 hours	Rs. 48,480

Calculate the appropriate material and labour variances.

14 From the following data, calculate overhead variance:

Fixed overhead budget for November	Rs. 50,000
Variable overhead budget for November	Rs. 1,00,000
Budgeted production for the month	25,000 units
Actual production for the month	27,000 units
Actual Fixed overhead incurred	Rs. 60,000
Actual variable overhead incurred	Rs. 1,20,000

15 The budgeted and actual sales of Vikas Ltd. Manufacturing and marketing a single product are furnished below:

Budgeted Sales	10,000 units at Rs. 10 per unit
	5,000 units at Rs. 8 per unit
Actual Sales	8,000 units at Rs. per unit

Calculate (a) Sales Value Variance

(b) Sales Price Variance and

(c) Sales Volume Variance

Answers to Activities

10.1	DMCV	=	Rs. 76,000 (F)		
	DMPV	=	Rs.60,000 (F)		
	DMUV	=	Rs. 16,000 (F)		
10.2	DLCV	=	Department A	Rs. 4,000 (A)	
			Department B	3,000 (F)	1,000 (A)
	DLRV	=	Department A	4,000 (A)	
			Department B	3,000 (A)	7,000 (A)
	DLEV	=	Department A	Nil	
			Department B	6,000 (F)	6,000 (F)
10.3	OCV	=	Rs. 2,000 (F)		
	VOCV	=	1,200 (F)		
	FOCV	=	800 (F)		
10.4	FOCV	=	Rs. 1,280 (A)		
	FOEXPV	=	8,000 (A)		
	FOVV	=	Rs. 6,720 (F)		

Notes:

FOCV = Recovered Fixed Overheads – Actual Fixed Overheads

= 1,26,720 – 1,28,000

= 1,280 (A)

Recovered Fixed Overheads have been calculated as under:

Man hours per day	6,400
Multiplied by output per man hour in units	X 0.9
Total units produced per day	
Multiplied by No. of working days	5,760
Total units produced in the month	X 22
Multiplied by standard overhead	1,26,720
Cost per unit i.e., Rs. 1,20,000 divided by 1,20,000 (6,000 X 1 X 20)	X 1
	Rs. 1,26,720

FOEXPV = Budgeted Fixed Overheads – Actual Fixed Overheads

= 1,20,000 – 1,28,000

= 8,000 (A)

FOVV = Recovered Fixed Overheads – Budgeted Overheads

= 1,26,720 – 1,20,000

= 6,720 (F)

10.5 Sales Variance

Sales value variance	Rs. 3,000 (A)
Sales Price variance	Rs. 1,000 (A)
Sales volume variance	Rs. 2,000 (A)
Budgeted Sales	Rs. 1,46,000
Less sales price variance (A)	-1,000
Less sales volume variance (A)	-2,000
Actual sales	1,43,000
Profit variance	500 (A)
Price variance	1,000 (A)
Volume variance	1,000 (A)
Overall cost variance	500 (A)

Statement of Reconciliation of Actual Profit with Budgeted Profit

Budgeted Profit =	Rs. 60,000	
Less unfavourable variances:		
Due to Price	Rs. 1,000*	
Due to cost	500*	1,500
Add favourable variances due		58,500
to volume***		1,000
Actual Profit		59,500

* Sales Price Variance is Rs. 1,000 as earlier shown.

** Variance in profit due to cost is: (Standard cost –Actual cost) X Actual Quantity.

Applying the formula –

A (12-13) X 4,000	=	4,000 (A)
B (10-9) X 3,500	=	3,500 (F)
		500 (A)

*** Variance in profit due to volume is (Standard Quantity – Actual Quantity) X Standard Profit

Applying formula –

A (3,000 – 4,000 X 10	=	10,000 (F)
B (10-9) X 3,500 X 6	=	9,000 (A)
		1,000 (F)

10.6 a) Labour cost increased because a higher wage was paid. Hence unfavourable Direct Labour Rate Variance (DLRV).

b) Material was wasted. More material was used than allowed by the standard. Hence unfavorable Direct Material Usage Variance (DMUV).

c) Factory office costs are a part of manufacturing overhead. As such it is a favourable Overhead Cost Variance (OCV).

d) Because the price change was anticipated and was already included for calculating standard material cost, it does not result in a variance from standard. Hence, no variance.

e) The substitution resulted in a higher price for material used though the quantity was not affected. Hence unfavourable Direct Material Price Variance (DMPV).

f) Whereas the standard time per leg is four minutes, the new worker took seven minutes. Hence unfavourable Direct Labour Efficiency variance (DLEV).

g) In this situation the actual fixed overhead costs and the budgeted costs were the same though the production level was higher by 22 per cent. The recovery *for* fixed overhead in made on per unit basis. This will result in favourable Fixed Overhead Volume Variance (FOVV).

Answers to Self-assessment Questions/Exercises

7 (a) True; (b) True; (c) True; (d) True; (e) False (f) True; (g) True; (h) True; (i) False.

8 (a) calculation, interpretation; (b) actual; (c) price, quantity; (d) fixed, variable; (e) budgeted, actual.

9 DMCV Rs. 1,500 (A); DMPV Rs. 1,250 (A); DMUV Rs. 250 (A)

10 (a) Rs. 20,000 (F); (b) Rs. 28,000 (F); (c) Rs. 48,000 (F)

11 Labour Rate Variance Rs. 360 (F)

(Hint: Standard wages Rs. 14,400; Actual wages Rs. 14,040

No note is to be taken of idle time).

12 Rate Variance Rs. 8,000 (A); Efficiency Variance Rs. 8,000 (A); Cost Variance Rs. 16,000 (A);

13 DMCV Rs. 8,130 (A); DMPV = Rs. 7,710 (A); DMUV Rs. 420 (A)

DLCV Rs. 2,400 (A); DLRV = Rs. 3,030 (A); DLEV Rs. 630 (F)

14 Volume Variance Rs. 4,000 (F); Expenditure Variance

Rs. 10,000 (A); Fixed Overhead Cost Variance Rs. 6,000 (A); Variable Overhead cost variance Rs. 12,000 (A)

15 (a) Rs. 36,000 (F); (b) Rs. 6,000 (F), (c) Rs. 30,000 (F)

10.13 FURTHER READINGS

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