6

Standard Costing

LEARNING OBJECTIVES :

After studying this unit you will be able to :

- Understand terms as standard Cost, standard Costing, standard Hour
- Understand how a standard costing system operates
- Calculate material, labour, overhead, sales value and sales margin variances
- Explain the terms operational and planning variances
- Explain the difference between actual profit and profit as per standard relating to the operating period

6.1 INTRODUCTION

You were introduced to Standard Costing in the earlier stages of your studies in which you understood the following;

- The evolution of Standard Costing
- The meaning of a Cost Sheet and its use for computing variances.
- The process of setting standards
- Computation of basic variances like Material Usage and Price, Labour Rate and
- Efficiency, Production Volume and Overhead Expenses.
- The reporting pattern of these variances
- Reconciliation of variances so as to arrive at the actual costing profit.
- Advantages and disadvantages of Standard Costing.
- The Accounting procedure for Standard Cost.

6.2 Advanced Management Accounting

In this chapter we shall extend our understanding of this important topic by studying elaborately the computation of various variances and the behavioral impact they can have on concerned personals.

6.2 DEFINITIONS

Cost variance is the difference between standard cost and the actual cost incurred. .

Variance analysis is the analysis of the cost variances into its component parts with appropriate justification of such variances, so that we can approach for corrective measures.

6.2.1 Classification of Variances

Variances can be established under material, labour & overheads. There are three distinct groups of variances that arise in standard costing which are

1) Variances of Efficiency

Variances due to the effective or ineffective use of materials quantities, labour hours, once actual quantities are compared with the predetermined standards.

2) Variances of Price Rates

Variances arising due to change in unit material prices, standard labour hour rates and standard allowances for indirect costs.

3) Variances Due to Volume

Variance due to the effect of difference between actual activity and the level of activity assumed when the standard was set.

6.2.2 Why Standard Costing

Standard Costing main purpose is to

- Investigate the reasons
- Identify the problems
- Take corrective action.

Variances are broadly of two types, controllable and uncontrollable. Controllable variances are those which can be controlled by the departmental heads whereas uncontrollable variances are those which are beyond control.

For example, price variance is normally regarded as uncontrollable if the price increase is due to market fluctuations. It becomes controllable if the production controller has failed to place orders in time and urgent purchase was made at extra cost. In the former case, no responsibility is attached to any one whereas the departmental head has responsibility for the loss in the latter case. Since all price variances are uncontrollable and are of significant nature and are persistent, the standard may need revision.

The possible reasons for each type of variances and the suggested course of action are given below. This list is only illustrative and not exhaustive.

Type of Variance	Reasons of Variance	Suggestive Course of Action
MATERIAL		
Material Price	• Change in Basic Price • Fail to purchase the anticipated standard quantities at appropriate price	• Departmental head should take necessary action to purchase at right point of time • Cash discount or interest rate for payment of purchase should be consider at the time of such payment • Price check on the purchase of standard quality materials
Material Usage	• Use of sub-standard material • Ineffective use of materials • Pilferage • Non standardised mix	• Regular Inspection of quality of materials • Proper training of operators • Ensure best utilisation of resources
LABOUR		
Labour Efficiency	• Change in design and quality standard • Poor working conditions • Improper scheduling	• Proper planning • Proper training • Healthy working environment • Timelines for achieving set targets
Labour Rate	• Improper placement of labour • Increments / high labour wages • Overtime	• Time Scheduling for work performance • Proper job allocation according to capabilities of workers

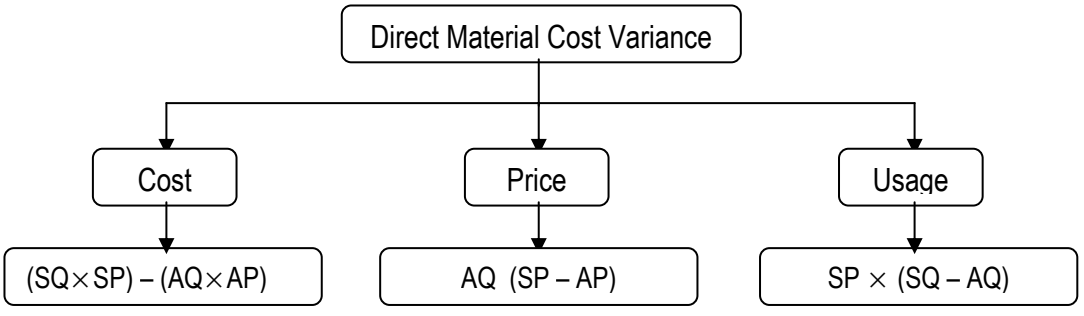
OVERHEADS		
Manufacturing	• Improper planning • Under or over absorption of fixed overheads • Reduction of sales • Breakdowns • Power failure • Labour Trouble	• Efficient planning for better Capacity utilization • Check on expenditure
Selling and Distribution	• Increase in delivery cost • Increase in stock holding period • Overtime	• Sales quotas • Sale Targets
Administrative	• Over expenditure	• Comparison of budgets with actuals • Introduction of Operating costing • Introduction of cost ratios

6.3 COMPUTATION OF VARIANCES

Let us now proceed to study with illustrations the method of computation of major variances described earlier. In all the problems illustrated in the following pages, 'F' means favourable variance and 'A' means adverse variance.

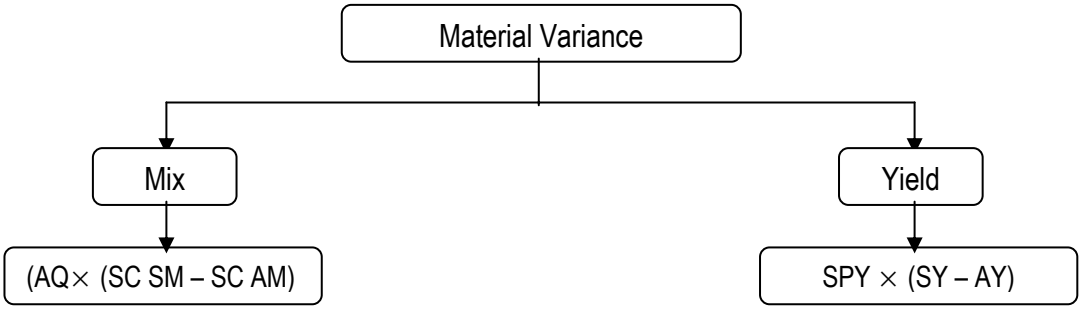
6.3.1 Direct Material Variances

The total direct material cost variance for actual output can basically be divided into two types, namely (a) price variance and (b) usage variance. The method of calculating these variances is as under:



SQ – Standard Quantity
SP – Standard Price

AQ – Actual Quantity
AP – Actual Price



SQ – Standard Quantity
SCSM – Standard Cost per Unit as per Standard Mix

AQ – Actual Quantity
SCAM – Standard Cost per Unit as per Actual Mix
SPY = Standard Price of Yield
SY = Standard Yield
AY = Actual yield

6.3.2 Relaion Verification

In relation to the verify the authenticity of the variance following are the identity proofs

- Cost Variance = Price Variance + Usage Variance
- Usage Variance = Mix Variance + Sub-usage Variance

6.3.3 Practical Problems

Illustration -1

The standard quantity of material required is 4 kgs. per unit of actual output. The relevant figures are as under:

Material	*A*	*B*	*C*	*D*
Standard mix %	30%	40%	20%	10%
Price per kg. (Rs.)	1.25	1.50	3.50	3.00
Actual qty. used (Kg.)	1,180	1,580	830	440
Actual price per kg. (Rs)	1.30	1.80	3.40	3.00

Actual output: 1,000 units

Calculate price variance, mix variance, sub-usage variance and total material cost variance.

Solution

Notes:

1) Since the actual output is 1,000 units, the standard quantity of materials required for the actual output is 1,000 units × 4 kgs. = 4,000 kgs.

Statement showing computation of standard cost, standard cost of actual quantity and actual cost.

Material	Std Cost (per Kg)	Act cost (per Kg)	Std Qty	Act Qty	Total Std Cost	Std. Cost of Actual Qty	Actual Cost
	Rs	Rs	Kg	Kg	Rs	Rs	Rs
	A	B	C	D	E = A×C	F = A×D	G = B×D
A	1.25	1.30	1,200	1,180	1,500	1,475	1,534
B	1.50	1.80	1,600	1,580	2,400	2,370	2,844
C	3.50	3.40	800	830	2,800	2,905	2,822
D	3.00	3.00	400	440	1,200	1,320	1,320
			4,000	4,030	7,900	8,070	8,520

2) Standard cost per unit of the standard mix

$$= \frac{\text{Rs. } 7,900}{4,000 \text{ Kgs.}} = \text{Rs } 1.975$$

3) Standard cost per unit of the actual mix

$$= \frac{\text{Rs. } 8,070}{4,030 \text{ Kgs}} = \text{Rs } 2.002$$

Variances:

i) Cost Variance = Std. cost – Actual cost
= Rs. 7,900 – Rs.8,520 = Rs. 620 (A)

ii) Price Variance = Actual Qty. (Std. price – Actual price)
= Rs 8,070 – Rs 8,520 = Rs 450 (A)

iii) Mix Variance = Actual Qty (Std cost per unit of std.mix – Std cost per unit of actual mix)
= 4,030 Kg (Rs 1.975 – Rs 2.002) = Rs 110 (A)

iv) Sub Usage Variance = Std price per unit of std mix (Std Qty – Actual Qty)
= 4,030 Kg (Rs 1.975 – Rs 2.002) = Rs 110 (A)

Verification:

Cost variance = Price variance + Mix variance + Sub-usage variance

Rs. 620 (A) = Rs 450 (A) + Rs 110 (A) + Rs 60 (A)

Illustration -2

The standard set for a chemical mixture of a firm is as under:

Material	Standard Mix %	Standard Price Per Kg (Rs)
A	40	60
B	60	30

The standard loss in production is 10 %. During a period, the actual consumption and price paid for a good output of 182 kg. are as under:

Material	Quantity in Kg	Actual Price Per Kg (Rs)
A	90	18
B	110	34

Calculate the variances.

Solution

Take the good output of 182 kgs. The standard quantity of material required for 182 kg of output is

$$\frac{182}{90} \times 100 = 202.22 \text{ Kgs.}$$

Statement showing the standard and actual costs and standard cost of actual mix

	Standard cost			*Actual cost*			*Std. cost of Actual quantity*		
Component	Qty. Kg.	Rate Rs.	Amount Rs.	Qty.	Rate	Amount	Oty. Kg.	Rate Rs.	Amount Rs.
A (40% of 202.22 kg.)	80.89	20	1,617.80	90	18	1,620	90	20	1,800
B (60% of 202.22 kg.)	121.33	30	3,639.90	110	34	3,740	110	30	3,300
Total Input	202.22	26	5,257.70	200	26.40		200	25.50	5,100
(-) Loss	20.22	—				5,360			
Total output	182.00	28.89	5,257.70	182	29.45		—	—	—

Standard yield in actual input is 90 % of 200 kg. i.e. 180 kg.

Variances :

i) Price Variance = Actual qty. (Std. price – Actual price.)
= Standard cost of actual qty. – Actual cost.
= Rs. 5,100 — Rs. 5,360 = Rs. 260 (A)

ii) Usage Variance = Std. price (Std. qty. – Actual qty.)
= Standard cost – Standard cost of actual quantity
= Rs. 5,257.70 – Rs. 5,100 = Rs. 157.70 (F)

iii) Mix Variance = Total actual qty. of input (Std. cost per unit of std. mix – Std. cost per unit of actual mix)
= 200 (Rs.26 – Rs.25.50) = Rs. 100(F)

iv) Yield Variance = Std. price of yield (Actual yield – Std. yield)
= Rs.28.89 (182 – 180) = Rs. 57.70 (F)

v) Total Variance = Std. cost – Actual cost
= Rs. 5,257.70 – Rs. 5,360 = Rs. 102.30 (A)

Verification:

Usage Variance = Mix variance + Sub-usage variance

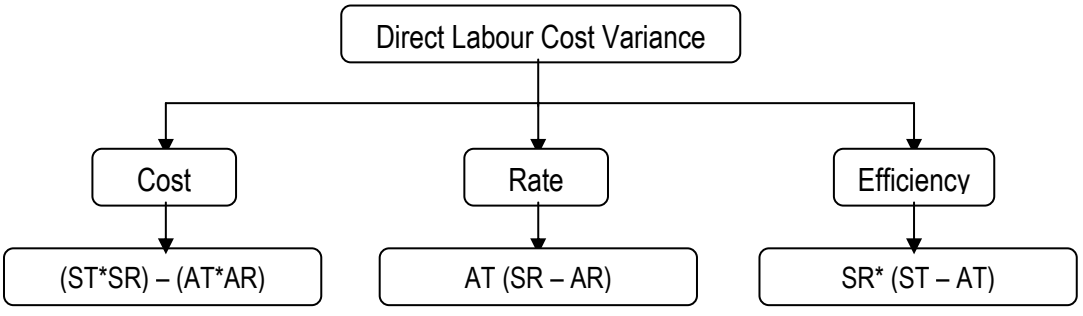
Rs. 157.70 (F) = Rs 100 (F) + Rs 57.70 (F)

Cost variance = Price variance + Mix variance + Sub-usage variance

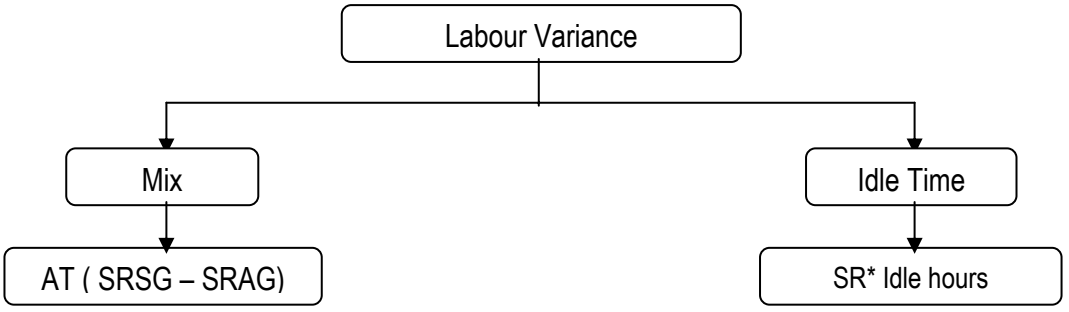
Rs. 102.30 (A) = Rs 260 (A) + Rs 110 (A) + Rs 60 (A)

6.3.4 Direct Labour Variances

The two basic variances that can be calculated in respect of direct labour are (a) rate variance and (b) efficiency variance. The formula's for calculating labour variances are as under:



ST – Standard Time ***AT – Actual Time***
SR – Standard Rate ***AR – Actual Rate***



ST – Standard Time
SR – Standard Rate
TSR – Standard Rate of Standard Gang

AT – Actual Time
AR – Actual Rate
SRAG – Standard Rate of Actual Gang

Idle hours – Actual working hours – Actual paid hours

Illustration -3

Given the following data, compute the variances.

	Skilled	*Semi-Skilled*	*Unskilled*
Number of workers in standard gang	16	6	3
Standard rate per hour	3	2	1
Actual number of workers in the gang	14	9	2
Actual rate of pay per hour (Rs.)	4	3	2

In a 40- hour week, the gang as a whole produced 900 standard hours.

Solution

In a 40 hour week, the standard gang should have produced 1,000 std. hours as shown below

Skilled	16 No. of workers × 40 hrs.	640
Semi – skilled	6 No. of workers × 40 hrs.	240
Unskilled	3 No. of workers × 40 hrs.	120
		1,000 hours

However, the actual output is 900 standard hours. Hence to find out the total labour cost variance, the standard cost (or cost charged to production) is to be computed with reference to 900 standard hours. This is done in the following statement:

Statement showing the Standard cost, Actual cost and Standard cost of Actual time for Actual output, i.e. 900 Standard hours

Gang	Standard Cost			Actual Cost			Std Cost of actual time		
	Hours	Rate	Amt	Hours	Rate	Amt	Hours	Rate	Amt
Skilled	576	3	1,728	560	4	2,240	560	3	1,680
Semi-skilled	216	2	431	360	3	1,080	360	2	720
Unskilled	108	1	108	80	2	160	80	1	80
Total	**900**		**2,268**	**1000**		**3,480**	**1000**		**2,480**

Variances:

i) Rate Variance = Actual time (Std. rate – Actual rate)
= (Standard cost of actual time – Actual cost)
= Rs. 2,480 – Rs.3,480 = Rs. 1,000 (A)

ii) Gang Variance = Total actual time (Std. rate of std. gang– Std. rate of actual gang)
= 1,000 (Rs. 2.52 – Rs. 2.48) = Rs 40(F)

iii) Sub-efficiency Variance = Std rate (Total std. time – Total actual time)
= Rs. 2.52 (900 hours – 1,000) = Rs. 252 (A)

iv) Cost Variance = Std. labour cost – Actual labour cost
= Rs. 2,268 – Rs. 3,480 = Rs. 1,212 (A)

v) Efficiency variance = Std. rate (Std. time – Actual time)
= Standard cost – Std. cost of actual time
= Rs. 2,268 – Rs. 2,480 = Rs.212 (A)

Illustration -4

A firm gives you the following data:

Standard time per unit	2.5 hours
Actual hours worked	2,000 hours
Standard rate of pay	Rs. 2 per hour

25 % of the actual hours has been lost as idle time.

Actual output	1,000 units
Actual wages	Rs. 4,500

Calculate the idle time variance.

Solution

Standard cost charged to production *(1,000 units× 2.5 hours × Rs.2)*	Rs. 5,000
Actual wages paid	Rs. 4,500
Actual wage rate per hour *(Rs. 4,500 ÷ 2,000 hours)*	Rs. 2.25
Std. wage rate per hour	Rs. 2.00
Abnormal idle time *(25% of 2,000 hours)*	500 hrs.

Variances :

i) Rate Variance = Actual time (Std.rate – Actual rate)
= 2,000 hours (Rs.2 – Rs.2.25) = Rs.500 (A)

ii) Efficiency Variance = Std. rate (Std.time – Actual time*)
= Rs.2 (2,500 hrs. –1500 hrs.) = Rs. 2,000 (F)

iii) Idle time Variance = Idle time × Std.rate
= 500 hrs. × Rs. 2 = Rs. 1,000

iv) Total Variance = Std.labour cost – Actual labour cost
= Rs. 5,000 – Rs. 4,500 = Rs. 500 (F)

**Actual time less idle time.*

6.3.5 Overhead Variances

Overhead variances arise due to the difference between actual overheads and absorbed overheads.

The actual overheads can be known only at the end of the accounting period, when the expense accounts are finalised. The absorbed overheads are the overheads charged to each unit of production on the basis of a pre-determined overhead rate. This pre-determined rate is also known as standard overhead recovery rate, standard overhead absorption rate or standard burden rate. To calculate the standard overhead recovery rate, we have to first make an estimate of the likely overhead expenses for each department for the next year. The estimate of budget of the overheads is to be divided into fixed and variable elements. An estimate of the level of normal capacity utilisation is then made either in terms of production or machine hours or direct labour hours. The estimated overheads are divided by the estimated capacity level to calculate the pre-determined overhead absorption rate as shown below:

$$\text{Std Fixed Overhead Rate} = \frac{\text{Budgeted Fixed Overheads}}{\text{Normal Volume}}$$

$$\text{Std Variable Overhead Rate} = \frac{\text{Budgeted Variable Overheads}}{\text{Normal Volume}}$$

Overhead variances can be classified in the following two major categories:

1) Variable Overhead Variances

2) Fixed Overhead Variances

Variable Overhead Variances

These variances arises due to the difference between the standard variable overhead for actual output and the actual variable overhead.

$$\text{Variable overhead variance} = \left[\left|\begin{array}{ll} \text{Standard} & \text{Actual} \\ \text{variable} & \text{variable} \\ \text{overhead} & \text{overhead} \end{array}\right|\right]$$

Variable overheads are usually measured in relation to output if the details of input quantities on which these variable overheads have been incurred are not readily available. In such cases, only variable overhead variance (as above) is calculated.

In case details of input quantities of variable overheads are available or variable overheads are related to hours of production, the variable overhead variance can be analysed further as :-

a) Variable overhead budget variance (Expenditure variance)

It is that part of variable overhead variance which arises due to the difference between the budgeted variable overhead and the actual variable overhead incurred.

Variable overhead budget variance = (Budgeted variable overhead for actual hours – Actual variable overheads)

b) Variable overhead efficiency variance :

It is that part of variable overhead variance which arises due to the difference between standard hours required for actual output and the actual hours worked. It can be computed by multiplying the difference of standard and actual hours by the standard variable overhead rate per hour. If standard hours exceed the actual hours worked, the variance will be favourable and vice versa.

Variable overhead efficiency variance = Standard Variable overhead per hour × (Std. hours for actual output – Actual hours)

Illustration - 5

XYZ Company has established the following standards for variable factory overhead.

Standard hours per unit : 6

Variable overhead per hour : Rs. 2/-

The actual data for the month are as follows:

Actual variable overheads incurred	Rs. 2,00,000
Actual output (units)	20,000
Actual hours worked	1,12,000

Calculate variable overhead variances viz

Solution

Working notes:

1) *Standard variable overhead* = Standard cost of actual output
= 20,000 units × 6 hours × Rs. 2
= Rs. 2,40,000

2) *Budgeted variable overhead (for actual hours)*
= 1,12,000 hours × Rs.2 = Rs.2,24,000

Variances

i) Variable overhead variance (refer Note 1 above) = (Standard variable overhead – Actual variable overhead)
= (Rs. 2,40,000 – Rs. 2,00,000)
= Rs. 40,000 (Favourable)

ii) Variable overhead budget variance (refer Note 2 above) = (Budgeted variable overhead for actual hours – Actual variable overhead)
= Rs. 2,24,000 – Rs. 2,00,000
= Rs. 24,000 (Favourable)

iii) Variable overhead efficiency variance = Standard variable overhead rate per hour [Std. hours for actual output – Actual hours]
= Rs. 2 [1,20,000 hours – 1,12,000 hours]
= Rs.2 × 8,000 hours
= Rs. 16,000 (Favourable)

Fixed Overhead Variances

Fixed overhead variances may be broadly classified into

a) *Expenditure variance :* It represents the difference between the fixed overheads as per budget and the actual fixed overheads incurred.

b) *Volume Variance:* This variance represents the unabsorbed portion of the fixed costs because of underutilization of capacity. In case a firm exceeds capacity, this variance is favourable in nature.

Illustration - 6

Fixed overhead as per budget i.e., estimated	Rs.5,000
Budgeted hours, i.e., estimated	10,000
Actual hours worked	7,000
Actual fixed overheads	Rs. 5,600

Compute the expenditure and volume variances.

Solution

Standard fixed overhead rate: = Rs 5000 / 10000 hrs = Rs 0.50 per hour

a) Fixed overhead absorbed 7,000 hours × Re.0.50 = Rs 3,500

b) Fixed overheads budgeted Rs.5,000

c) Actual fixed overheads Rs.5,600

Variances

Expenditure Variance = Budgeted overheads – Actual overheads

= Rs. 5,000 – Rs. 5,600

= Rs. 600 (A)

Volume Variance = Std. fixed overhead rate of absorption ×

(Actual hrs. worked – Budgeted hrs. to be worked)

= Re.0.50 (7,000hrs. – 10,000hrs.)

= Rs. 1,500 (A)

Total variance = Fixed overheads absorbed – Actual fixed overheads

= Rs. 3,500 – Rs. 5,600

= Rs.2,100 (A)

Illustration – 7

You are given the following data :

	Budgeted	*Actual*
Fixed overhead for July	Rs.10,000	Rs. 10,200
Units of production in July	5,000	5,200
Standard time for one unit	4 hours	
Actual hours worked	20,100 hours	

Calculate all variances relating to fixed overheads

Solution

(a) **Total fixed overhead variance** = Absorbed fixed overheads – Actual fixed overheads

= (5,200units× Rs. 2) – Rs. 10,200 = Rs.200 (F)

(b) **Expenditure variance** = Budgeted overheads–Actual overheads

= Rs. 10,000 – Rs. 10,200 = Rs. 200(A)

(c) **Volume variance** = Standard rate of absorption per unit × (Actual production – Budgeted production)

= Rs.2 (5,200 units —5,000 units)=Rs. 400 (F)

This can be divided into capacity variance and efficiency variance as shown below :

Capacity variance = Standard rate of absorption per hour (Actual hours capacity – Budgeted hours capacity)

= Re. 0.50 (20,100 hours – 20,000 hours) = Rs 50(F)

Efficiency variance = Standard rate of absorption per hour (Standard hours required – Actual hours)

= Re.0.50 (20,800 hours – 20,100 hours) = Rs.350 (F)

Working Notes :

Std. hours required for actual production: 5,200 units × 4 hours = 20,800 hours

Calender variance : Calender variance arises due to the fact that the estimated fixed overheads are the same for each month or period irrespective of the actual number of working days. It is that portion of the volume variance which is due to the

difference between the number of working days in the budget period and the number of actual working days in the period to which the budget is applied. The number of working days in the budget period are arrived at simply by dividing the number of annual days by twelve.

Illustration – 7

Budgeted No. of working days	24
Budgeted No. of hours per month	12,000
Fixed overhead rate	Re.0.50 per hour
Actual No. of working days in June	25

Compute the calendar variance.

Solution

Budgeted daily hours per day of June = 12,000 hrs./24 days = 500 hrs.

Actual available hours for June = 500 hours × 25 days = 12,500 hours

Calendar Variance = *Std. fixed overhead rate per hr*

(No. of hrs. in actual period – No. of hrs. in budgeted period)

= Re.0.50 (12,500 hours – 12,000 hours) = Rs. 250 (F)

Alternatively, this variance can be calculated by using number of days instead of hours. In that case, overhead rate will be on per day basis.

***Overhead Expenses Variance*:**

Normally, for several type of overhead expenses either a single recovery rate or two recovery rates, one representing fixed overheads and the other representing variable overheads, will be prepared. The following illustration shows how overhead expense rates are computed and variances analysed.

Illustration -8

The overhead expense budget for a cost centre is as under:

Indirect material	Re.0.40 per hour
Indirect labour	Re.0.60 per hour
Maintenance	Re. 0.40 per hour
Power	Re. 0.30 per hour
Sundries	Re. 0.30 per hour
Total variable expenses	Rs. 2.00 per hour
Fixed overhead budgeted	Rs. 240

Budgeted output = 9,600 units or 120 standard hours.

At the end of a period the actual rates given by the accounts department are as under:

Power Re.0.32; maintenance Re.0.45; indirect labour Re.0.60; indirect material Re.0.50 and sundry expenses Re. 0.29 per hour; total variable expenses were Rs. 2.16 per hour. The actual output is 12,160 units for which the actual hours worked are 156. The fixed expenses amounted to Rs. 250. Compute the variances.

Solution

Expenses	*Overhead Expenses Schedule*			
	Budget: 120 Std. Hours		*Actual: 156 Hours*	
	Rate per hour Rs	Expenses R s	Rate per hour Rs	Expenses R s
Indirect material	0.40	48	0.50	78
Indirect labour	0.60	72	0.60	94
Maintenance	0.40	48	0.45	70
Power	0.30	36	0.32	50
Sundries	0.30	36	0.29	45
Total variable overheads	2.00	240	2.16	337
Fixed overheads	2.00	240		250
Total overheads		480		587

Actual output = 12,160 units.

Hence standard hours produced or std. hours for actual production

$$= \frac{120 \text{ std. hours}}{9{,}600 \text{ units}} \times 12{,}160 \text{ actual output} = 152 \text{ hours.}$$

Computation of variances: A. Fixed expenses

(a) Charged to production (152 hours × Rs. 2 per hours) Rs. 304

(b) Fixed expenses as per budget Rs. 240

(c) Actual fixed overheads Rs. 250

Volume variance = Fixed overhead recovery rate (Actual volume in std. hrs. – Budgeted volume in standard hrs.)

= Rs.2 (152 – 120) = Rs.64 (F)

Expenses variance = (Budgeted expenses – Actual expenses)
= Rs.240 – Rs.250 = Rs. 10 (A)

Total variance = (Fixed overheads absorbed – Actual fixed overheads)
= Rs.304 – Rs.250 = Rs.54 (F)

Volume variance: (a – b)	Rs.64 (F)
Expenses variance: (b – c)	Rs. 10 (A)
Total variance : (a – c)	Rs.54 (F)

B. Variable expenses

(a)	Charged to production: (152 hours × Rs.2)	Rs.304
(b)	Actual expenses	Rs.337
	Variable expenses variance (a – b)	Rs.33 (A)

Fixed expenses

(a) Charged to production 152 hours (Std.hours) at Rs.2 per hour Rs.304

(b) Actual working hours × Std. rate: (156 hours × Rs. 2) Rs.312

(c) Fixed expenses as per budget Rs.240

(d) Actual fixed overheads Rs.250

Efficiency variance = Std. fixed overhead rate per hr. (Std. hrs. for actual production – Actual hrs)
= Rs. 2 (152 hours – 156 hours) = Rs.8 (A)

Capacity variance = Std. fixed overhead rate per hour (Actual capacity – Budgeted capacity)
= Rs.2 (156 hours – 120 hours) = Rs.72 (F)

Volume variance = Fixed overhead recovery rate per hr. (Actual volume in Standard hrs. – Budgeted volume in standard hrs.)
= Rs. 2 (152 hours – 120 hours) = Rs. 64 (F)

Expense variance = Budgeted expenses – Actual expenses
= Rs. 240 – Rs.250 = Rs. 10 (A)

Total variance = Fixed overheads absorbed – Actual fixed overheads

= Rs. 304 – Rs. 250 = Rs. 54 (F)

OR

Efficiency variance	: (a – b)	Rs. 8 (A)
Capacity variance	: (b – c)	Rs. 72 (F)
Volume variance	: (a – c)	Rs.64 (F)
Expenses variance	: (c – d)	Rs.10 (A)
Total variance	: (a – d)	Rs.54 (F)

Illustration 9

Following is the standard cost card of a component:

Materials	2 Units at Rs. 15	Rs. 30
Labour	3 Hours at Rs.20	Rs. 60
Total overheads	3 Hours at Rs.10	Rs. 30

During a particular month 10,000 units of the component were produced and the same was found to be at 60% capacity of the budget. In preparing the variance report for the month, the cost accountant gathered the following information:

Labour	Rs.6,50,000
Variable overheads	Rs.2,00,000
Fixed overheads	Rs.3,00,000
Material price variance	Rs. 70,000 (A)
Material cost variance	Rs. 50,000 (A)
Labour rate variance	Rs. 50,000 (F)
Fixed overhead expenditure variance	Rs. 50,000 (A)

You are required to prepare from the above details:

(1) Actual material cost incurred

(2) Standard cost of materials actually consumed

(3) Labour efficiency variance

(4) Variable OH efficiency variance

(5) Variance OH expenditure variance

(6) Fixed OH efficiency variance

(7) Fixed OH capacity variance

(8) Fixed OH volume variance

Solution

1. Actual material cost incurred

Material cost variance

= Standard cost of material of actual output - Actual material cost incurred

$$\text{Or Actual material cost incurred} = \left\{\begin{matrix}\text{Standard cost of material}\\ \text{of actual output}\end{matrix} - \begin{matrix}\text{Material cost}\\ \text{variance}\end{matrix}\right\}$$

= {10,000 units × 2 units × Rs. 15 + Rs. 50,000}

= Rs.3,00,000 + Rs. 50,000 = Rs. 3,50,000

2. Standard cost of materials actually consumed

Material price variance

= (Standard cost - Actual cost) Actual quantity consumed

$$\text{Or} \begin{matrix}\text{Standard cost of}\\ \text{materials actually consumed}\end{matrix} = \left\{\begin{matrix}\text{Actual material}\\ \text{cost incurred}\end{matrix} + \begin{matrix}\text{Material price}\\ \text{variance}\end{matrix}\right\}$$

= Rs. 3,50,000 – Rs. 70,000 = Rs. 2,80,000

3. Labour efficiency variance

(Refer to working note 1)

$$= \left\{\begin{matrix}\text{Standard hours}\\ \text{for actual output}\end{matrix} - \begin{matrix}\text{Actual hours}\\ \text{worked}\end{matrix}\right\} \begin{matrix}\text{Standard rate}\\ \text{per hour}\end{matrix}$$

= {10,000 units × 3 hours – 35,000 hours} Rs. 20

= {Rs. 6,00,000 – Rs. 7,00,000} = Rs. 1,00,000 (Adv.)

4. Variable OH efficiency variance

(Refer to working note 2)

$$= \begin{matrix}\text{Standard variable overhead}\\ \text{rate per hour}\end{matrix} \left\{\begin{matrix}\text{Standard}\\ \text{hours}\end{matrix} - \begin{matrix}\text{Actual}\\ \text{hours}\end{matrix}\right\}$$

= Rs. 5 {30,000 hours – 35,000 hours} = Rs. 25,000 (Adv.)

5. Variable OH expenditure variance

(Refer to working note 1)

$$= \left\{\begin{matrix}\text{Budgeted variable overhead} \\ \text{for actual hours}\end{matrix} - \begin{matrix}\text{Actual variable} \\ \text{overhead}\end{matrix}\right\}$$

= {Rs. 5 × 35,000 hours – Rs. 2,00,000} = Rs. 25,000 (Adv.)

6. Fixed OH efficiency variance

(Refer to working notes 1 & 2)

$$= \begin{matrix}\text{Standard fixed overhead} \\ \text{rate per hour}\end{matrix} \left\{\begin{matrix}\text{Standard hours for} \\ \text{actual output}\end{matrix} - \begin{matrix}\text{Actual} \\ \text{hours}\end{matrix}\right\}$$

= Rs.5 {30,000 hours – 35,000 hours} = Rs. 25,000 (Adv.)

7. Fixed OH capacity variance

(Refer to working notes 1 & 2)

$$= \begin{matrix}\text{Standard fixed overhead} \\ \text{rate per hour}\end{matrix} \left\{\begin{matrix}\text{Actual capacity} \\ \text{hours}\end{matrix} - \begin{matrix}\text{Budgeted capacity} \\ \text{hours}\end{matrix}\right\}$$

= Rs. 5 {35,000 hours – 50,000 hours}

= Rs. 75,000 (Adv.)

8. Fixed OH volume variance

(Refer to working note 2)

$$= \text{Standard fixed overhead} \left\{\begin{matrix}\text{Actual} \\ \text{out}\end{matrix} - \begin{matrix}\text{Budgeted} \\ \text{output}\end{matrix}\right\}$$

$$= \text{Rs.15} \left\{10{,}000 \text{ units} - \frac{50{,}000 \text{ hours}}{3 \text{ hours}}\right\}$$

= Rs.1,50,000 – Rs.2,50,000 = Rs. 1,00,000 (Adv.)

Working notes :

1. *Labour rate variance* = (SR – AR) x AH

   Or 50,000 = 20 x AH = 50,000 + 6,50,000

   Or 20 x AH = 50,000 + 6,50,000

   Or AH = 35,000

2. Standard hours = 10,000 units × 3 hours = 30,000 hours

Budgeted hours = $\left\{\frac{30{,}000 \text{ hours} \times 100}{60}\right\}$ = 50,000 hours

Budgeted fixed overhead = Actual fixed overhead + Expenditure variance

= Rs.3,00,000 – Rs. 50,000 = Rs. 2,50,000

$$\left\{\begin{matrix}\text{Standard fixed overhead}\\ \text{recovery rate per hour}\end{matrix}\right\} = \frac{\text{Rs.2,50,000}}{\text{50,000 hours}} = \text{Rs. 5 per hour}$$

Total overhead rate per hour = Rs.10

Variable overhead rate per hour (Rs. 10 – Rs. 5) = Rs. 5

3. Standard fixed overhead per unit (3 hours × Rs.5/-) = Rs.15

Illustration 10

The Standard Cost Card of producing one unit of Item 'Q' is as under:

		Rs.
Direct material —	A — 12 Kg. @ Rs.10/-	120
	B — 5 Kg. @ Rs.6/-	30
Direct wages —	5 Hrs. @ Rs.3/-	15
Fixed production overheads		35
Total standard cost:		200
Standard gross profit		50
Standard sale price		250

Fixed Production overhead is absorbed on expected annual output of 13,200 units. Actual result for the month of September, 1997 are as under:

Actual production : 1,000 units

			Rs.
Sales	1,000 units @ Rs.250		2,50,000
Direct material	A	11,000 Kg.	1,21,00
	B	5,200 Kg.	28,600

Direct wages	5,500 Hrs.	17,500
Fixed Overheads		39,000
		2,06,100
	Gross profit	43,900

You are required to calculate all variances. Material price variance is taken out at the time of receipt of Material. Material purchased were:

12,000 Kg. of 'A' @ Rs.11 & 5,000 Kg. of 'B' @ Rs.5.50.

Solution

Basic data :

(1) **Statement showing standard and actual costs of material for 1,000 units of output and standard cost of actual input**

	Standard Cost			*Actual cost*			*Standard cost of actual input = (Actual quantity × Standard price)*		
Materials	*Qty. (Kg)*	*Price (Rs.)*	*Amount (Rs.)*	*Qty. (Kg)*	*Price (Rs.).*	*Amount (Rs.).*	*Actual Qty. (Kg)*	*Standard price/kg (Rs.)*	*Amount (Rs.)*
A	12,000	10	1,20,000	11,000	11	1,21,000	11,000	10	1,10,000
B	5,000	6	30,000	5,200	5.50	28,600	5,200	6	31,200
			1,50,000			1,49,600			1,41,200

$$\text{Standard yield (units)} = \frac{1{,}000 \text{ units}}{17{,}000 \text{ kgs}} \times 16{,}200 \text{ kgs} = 952.941764 \text{ units approx.}$$

(2) **Statement showing standard and actual labour cost of 1000 units produced and standard cost of actual labour hrs.**

Hours	*Rate p.h. (Rs.)*	*Amount (Rs.)*	*Hours*	*Rate p.h. (Rs.)*	*Amount (Rs.)*	*Hours*	*Rate p.h. (Rs.)*	*Amount (Rs.)*
5,000	3	15,000	5,500	3.1818	17,500	5,500	3	17,500

(3) **[Overheads]**

	Budgeted	*Actual*
Fixed overhead (Rs.)	38,500	39,000
Hours	5,500	5,500
Output (units)	1,100	1,000
Standard time p.u. (hrs)	5	
Standard fixed overhead p.u. (Rs.)	35	
Standard fixed overhead rate p.h. (Rs.)	7	

Computation of material variances (Refer to Basic data 1):

Material cost variance = Standard cost – Actual cost

= Rs.1,50,000 – Rs.1,49,600 = Rs.400 (Fav.)

Material price variance = Actual quantity (Std. price – Actual price)

= 11,000 kgs. (Rs.10 – Rs.11) + 5,200 kgs. (Rs.6 – Rs.5.50)

= Rs.11,000 (Adv.) + Rs.2,600 (Fav.)

= Rs.8,400 (Adv.)

Material usage variance = Standard price (Standard quanity – Actual quanity)

= Rs.10 (12,000 kgs – 11,000 kgs) + Rs.6 (5,000 kgs – 5,200 kgs)

= Rs.10,000 (Fav.) + Rs.1,200 (Adv.)

= Rs.8,800 (Fav.)

Material mix variance = Total actual quantity $\left\{\begin{matrix}\text{Std. price of}\\ \text{std. mix per kg}\end{matrix} - \begin{matrix}\text{Std price of}\\ \text{actual mix per kg}\end{matrix}\right\}$

= 16,200 kgs $\left\{\frac{\text{Rs. 1,50,000}}{\text{17,000 kgs}} - \frac{\text{Rs. 1,41,200}}{\text{16,200 kgs}}\right\}$

= Rs.1,741.18 (Fav.)

Material yield variance = Std. rate (Actual yield – Std. yield)

= Rs.150 {1,000 units – 952.9411764 units}

= Rs.7,058.82 (Fav.)

Material purchase price variance:

= Actual quantity of material purchased (Std. price per kg – Actual price per kg)

= 12,000 kgs (Rs.10 – Rs.11) + 5,000 kgs (Rs.6 – Rs.5.50)

= Rs.12,000 (Adv.) + Rs.2,500 (Fav.) = Rs.9,500 (Adv.)

Computation of labour variances (Refer to basic data 2):

Labour cost variance = (Standard cost – Actual cost)

= Rs.15,000 – Rs.17,500 = Rs.2,500 (Adv.)

Labour rate variance = Actual hrs. (Std. rate – Actual rate)

= 5,500 (Rs.3 – Rs.3.1818)

= Rs.1,000 (Adv)

Labour efficiency variance = Std. rate p.h. (Std. hours – Actual hours)

= Rs.3 (5,000 hrs. – 5,500 hrs.)

= Rs.1,500 (Adv.)

Computation of fixed overhead variance:

Total fixed overhead variance:

= Fixed overhead absorbed – Actual fixed overhead

= 1,000 units × Rs.35 – Rs.39,000

= Rs.35,000 – Rs.39,000 = Rs.4,000 (Adv.)

Fixed overhead expenditure variance:

= Budgeted fixed overhead – Actual fixed overhead

= Rs.38,500 – Rs.39,000 = Rs.500 (Adv.)

Fixed overhead volume variance:

= Std. fixed overhead rate per unit {Actual output – Budgeted output}

= Rs.35 {1,000 units – 1,100 units} = Rs.3,500 (Adv.)

Efficiency variance:

= Std. fixed overhead rate per unit { Actual output – Budgeted output}

= Rs.35 {1,000 units – 1,100 units} = Rs.3,500 (Adv.)

Illustration 11

The following information is available in respect of Y Ltd. for a week :

(a) 400 kg of raw material were actually used in producing product 'EXE'. The purchase cost thereof being Rs. 24,800. The standard price per kg of raw material is Rs. 60. The expected output is 12 units of product 'EXE' from each kg of raw material. Raw material price variance and usage variance as computed by cost accountant are Rs. 800 (adverse) and Rs. 600 (adverse) respectively.

(b) The week is of 40 hours. The standard time to produce one unit of 'EXE' is 30 minutes. The standard wage rate is Rs. 5 per labour hour. The company employs 60 workers who have been paid hourly wage rate as under :

Number of workers	:	6	8	46
Hourly wage rate (Rs.)	:	4.80	5.20	5.00

(c) Budgeted overheads for a four-weekely period is Rs. 81,600. The actual fixed overheads spent during the said week are Rs. 19,800.

(d) Entire output of 'EXE' has been sold at its standard selling price of Rs. 15 per unit.

You are required to :

(i) Compute the variances relating to labour and overheads.

(ii) Prepare a statement showing total standard costs, standard profit and actual profit for the week.

Solution

Working notes :

1. Standard quantity and cost of raw material required for actual output :

Actual output of EXE (units)	4,680
Standard output per kg. of raw material (units)	12
Standard quantity of raw materials required for actual output (kgs.)	390
(4,680 units/12 units)	
Standard cost of 390 kgs. of raw material at Rs. 60 per kg* (Rs.)	23,400

2. Basic data for the computation of labour variances :

Standard labour data for actual output				*Actual data*		
Std. time hours	*Rate p.h.*	*Amount*	*Standard cost for actual hours*	*Actual hours*	*Rate p.h.*	*Amount*
	(Rs.)	*(Rs.)*	*(Rs.)*	*(Rs.)*	*(Rs.)*	*(Rs.)*
2,340	5	11,700	12,000	240	4.80	1,152
(4,680 units × 1/2 hr.)				320	5.20	1,664
				1,840	5.00	9,200
2,340		11,700	12,000	2,400		12,016

3. Basic data for the computation of fixed overhead variances :

Budgeted Std. data		*Actual data*	
Budgeted fixed overhead (Rs.)	20,400	Actual fixed overhead (Rs.)	19,800
(for 1 week)			
Budgeted hours	2,400	Actual labour hours	2,400
(60 workers × 40 hrs. per week)		Actual output (units)	4,680
Budgeted output (units)	4,800		
Std. rate p.h. (Rs.)	8.50		
Std. rate p.u. (Rs.)	4.25		

(i) **Computation of labour and overhead (variances) :**

Labour cost variance : (Refer to Working note 2)

= (Std. cost of labour – Actual cost of labour)

= Rs. 11,700 – Rs. 12,016 = Rs. 316 (Adv.)

Labour rate variance :

= Actual hours (Std. rate - Actual rate)

= Rs. 12,000 – Rs. 12,016

= Rs. 16 (Adv.)

Labour efficiency variance :

= Standard rate per hr. (Std. hours – Actual hours paid)

= (Rs. 11,700 – Rs. 12,000) = Rs. 300 (Adv.)

Total fixed overhead cost variance :

= (Fixed overhead absorbed – Actual fixed overhead)

= {4,680 units × Rs. 4.25 – Rs. 19,800}

= (Rs. 19,890 – Rs. 19,800} = Rs. 90 (Fav.)

Fixed overhead volume variance :

= Std. fixed overhead rate per unit {Actual output – Budgeted output)

= Rs. 4.25 {4,680 units – 4,800 units}

= Rs. 510 (Adverse)

Fixed overhead expenditure variance :

= {Budgeted fixed overhead – Actual fixed overhead}

= {Rs. 20,400 – Rs. 19,800}

= Rs. 600 (Fav.)

(ii) Statement showing total standard cost, standard profit and actual profit for the week

	Rs.	*Rs.*
Sales		70,200
(4,680 units × Rs. 15)		
Less : Standard costs of :		
Direct material	23,400	
Direct labour	11,700	
Overheads	19,890	54,99
(4,680 × Rs. 4.25)		
(*Refer to working notes 1 to 3*)		
Standard profit		15,210
Less : Adjustment for variance :		
Raw material :		
Price variance : 800 (A)		
Usage variance : 600 (A)		
Labour :	1,400 (A)	
Rate Variance : 16 (A)		
Efficiency variance :300 (A)		

Overhead :		316 (A)	
Expenditure variance :	600 (F)		
Volume variance :	510 (A)	90 (F)	1,626
Actual profit			13,584

Illustration 12

Assuming the expenses to be fixed, calculate from the following data :

(a) Efficiency variance, (b) Volume variance, (c) Calendar variance and (d) Expense variance

	Budget	*Actual*
No. of working days per month	20	22
Man hours per day	8,000	8,400
Output per man hour in units	1.0	1.2
Standard overhead rate per man hour	Rs.2	
Actual fixed expenses per month		Rs.3,25,000

Solution

Actual output : 8,400 hours **×** 22days **×** 1.2 units per hour = 2,21,760 units.

Standard output per man hour: 1

Standard hours produced or std. hrs. for actual production :2,21,760 units**×**1 hr. = 2,21,760 hrs.

Budgeted hrs. in budgeted days: 8,000 hours **×** 20 days = 1,60,000 hours

Budgeted hours (capacity) in actual working days: 8,000 hrs. **×** 22 days = 1,76,000 hours

Actual hours worked: 8,400 hours **×** 22 days = 1,84,800 hours

Overheads as per budget: 8,000 hours × 20 days **×** Rs. 2 per hour = Rs.3,20,000

	Rs.
(a) Standard cost charged to production : 2,21,760 hours × Rs.2	4,43,520
(b) Actual hours worked × Standard rate : 1,84,800 hours × Rs.2	3,69,600
(c) Budgeted hours in actual days × Std. rate: 1,76,000 × Rs.2	3,52,000
(d) Overheads as per budget	3,20,000
(e) Actual overheads	3,25,000

Efficiency variance = Std.fixed overhead rate per hour (Std. hrs. for production – Actual hrs.)

= Rs.2 (2,21,760 hours – 1,84,800 hours) = Rs.73,920 (F)

Capacity variance	=	Standard fixed overhead rate per hour (Actual capacity – Budgeted capacity)
	=	Rs.2 (1,84,800 hours – 1,76,000 hours) = Rs.17,600 (F)
Calendar variance	=	Standard fixed overhead rate per hour (Budgeted hrs. in actual days – Budgeted hrs. in budgeted days)
	=	Rs.2 (1,76,000 hours – 1,60,000 hours) = Rs.32,000 (F)
Volume variance	=	Standard fixed overhead rate per hour (Actual volume in hrs. – Budgeted volume in hrs.)
	=	Rs.2 (2,21,760 hours – 1,60,000 hours) = Rs. 1,23,520(F)
Expenses variance	=	Budgeted expenses – Actual expenses
	=	Rs.3,20,000 – Rs.3,25,000 = Rs.5,000 (A)
Total variance	=	Overheads charged to production – Actual overheads
	=	Rs. 4,43,520 – Rs.3,25,000 = Rs. 1,18,520 (F)

OR

		Rs.
Efficiency variance	: (a – b)	73,920 (F)
Capacity variance	: (b – c)	17,600 (F)
Calendar variance	: (c – d)	32,000 (F)
Volume variance	: (a – d)	1,23,520 (F)
Expense variance	: (d – e)	5,000 (A)
Total variance	: (a – e)	1,18,520 (F)

Illustration 13

Mr. M provides the following information relating to 1,000 units of product 'ZED' during the month of April, 1998

Standard price per kg. of raw material – Rs.3

Actual total direct material cost – Rs.10,000

Standard direct labour hours – 1,600

Actual direct labour hours – 1,800

Total standard direct labour cost – Rs.8,000

Standard variable overhead per direct labour hour – Re.1

Standard variable cost per unit of ZED – Rs.1.60

Total standard variable overheads – Rs.1,600

Actual total variable overheads – Rs.1,620

The material usage variance is Rs. 600 (adverse) and the overall cost variance per unit of ZED is Re.0.07 (adverse) as compared to the total standard cost per unit of ZED of Rs. 21.

You are required to compute the following:

(a) Standard quantity of raw-material per unit of ZED.

(b) Standard direct labour rate per hour.

(c) Standard direct material cost per unit of ZED.

(d) Standard direct labour cost per unit of ZED.

(e) Standard total material cost for the output.

(f) Actual total direct labour cost for the output

(g) Material price variance.

(h) Labour rate variance.

(i) Labour efficiency variance.

(j) Variable overhead expenditure variance.

(k) Variable overheads efficiency variance.

Solution

Working Notes :

1. *Standard cost of raw-material consumed :*

	Rs.	Rs.
Total standard cost of ZED (1,000 units × Rs.21)		21,000
Less: Standard cost : Labour	8,000	
Overheads	1,600	9,600
Standard cost of raw materials used		11,400

2. *Standard cost of raw–material per finished unit:*

$$\frac{\text{Total cost of material}}{\text{Output}} = \frac{\text{Rs. } 11,400}{1,000 \text{ units}} = \text{Rs. } 11.40$$

3. *Standard quantity of raw - material per finished unit and total quantity of raw material required :*

$$\frac{\text{Standard cost of material per unit}}{\text{Standard rate per kg.}} = \frac{\text{Rs. } 11.40}{\text{Rs. } 3.00} = 3.8 \text{ kgs. per finished unit}$$

Total quantity – 3.8 kg. × 1,000 units = 3,800 kgs.

4. *Total material cost variance :*

Actual cost of raw material	Rs.10,000
Standard cost of raw material	Rs.11,400
Total material cost variance	Rs. 1,400 (F)

5. *Actual quantity (A Q) of raw–material (in kgs):*

Material usage variance = Standard rate (Standard quantity – Actual quantity).
or, Rs. 600 (A) = Rs. 3 (3,800 Kgs. – AQ)
or, 3AQ = 12,000 kgs. or, AQ = 4,000 kgs.

(Material usage variance is as given in the question and standard quantity is as per (3) above)

6. *Actual rate of raw material per kg.*

$$\frac{\text{Actual material cost}}{\text{Actual quantity}} = \frac{\text{Rs. 10,000}}{\text{4,000 kgs.}} = \text{Rs. 2.50 per kg.}$$ (*As per (5) above.)

7. *Standard direct labour rate*

Standard direct labour hours = 1,600 (given)
Standard direct labour cost = Rs. 8,000 (given)

$$\text{Standard direct labour hour rate} = \frac{\text{Rs . 8,000}}{\text{1,600 hrs .}} = \text{Rs. 5}$$

8. *Actual labour cost and actual labour rate per hour:*

Actual total cost of 1,000 units		Rs. 21,070
1,000 units (Rs. 21 + Re. 0.07)		
Less : Actual cost of material	Rs. 10,000	
Actual variable overheads	Rs. 1,620	Rs. 11,620
Actual direct labour cost		Rs. 9,450

$$\text{Actual direct labour rate per hr.} = \frac{\text{Rs . 9 ,450}}{\text{1,800 hrs .}} = \text{Rs.5.25}$$

9. *Standard labour hours to produce one unit:*

$$\frac{\text{Standard hours}}{\text{Output in units}} = \frac{\text{1,600 hours}}{\text{1,000 units}} = \text{1.6 hours}$$

10. *Standard labour cost per unit:*

Standard labour cost per unit = 1.6 hours × Rs. 5 = Rs.8

11. *Actual hourly rate of variable overheads :*

$$\frac{\text{Actual variable overheads}}{\text{Actual hours}} = \frac{\text{Rs.1,620}}{\text{1,800 hours}} = \text{Re. 0.90}$$

Computations:

(a) Standard quantity of raw material per unit of ZED : 3.8 kg. *(Refer to working note 3).*

(b) Standard direct labour rate per hour Rs. 5 *(Refer to working note 7).*

(c) Standard direct material cost per unit of ZED : Rs. 11.40 *(Refer to working note 2) .*

(d) Standard direct labour cost per unit of ZED: Rs. 8 *(Refer to working note 10).*

(e) Standard total material cost for the output: Rs. 11,400 *(Refer to working note 1).*

(f) Actual total direct labour cost for the output: Rs. 9,450 *(Refer to working note 8).*

(g) *Material price variance* = Total material cost variance – Material usage variance.

= Rs. 1,400 (favourable)* – Rs. 600 (Adverse)

*(*Refer to working note 4)*

Alternatively,

= Rs. 2000 (Favourable)

= Actual quantity (Standard rate – Actual rate)

= 4,000 units (Rs. 3 – Rs. 2.50)* *(* Refer to working note 6)*

= Rs. 2,000 (Favourable)

(h) *Labour rate variance:*

= Actual hours (Standard rate – Actual rate)

= 1,800 hours (Rs. 5 – Rs. 5.25)

= Rs. 450 (Adverse)

(i) *Labour efficiency variance:*

Standard rate (Standard hours – Actual hours)

= Rs. 5 per hour (1,600 hours – 1,800 hours) = Rs. 1,000 (Adverse)

(j) *Variable overhead expenditure variance :*

= Actual hours (Standard rate – Actual rate)

= 1,800 hours (Re. 1 – Re. 0.90)* = Rs. 180 (Favourable) *(*Refer to working note)*

(k) *Variable overhead efficiency variance*

= Standard rate (Standard hours – Actual hours)

= Re. 1 per hour (1,600 hours – 1,800 hours) = Rs. 200 (Adverse)

6.3.4 Sales variances:

The sales variances can be computed in two ways. They are :

(a) Sales turnover or value method.

(b) Profit or sales margin method.

(a) Sales turnover or sales value method : In the sales turnover method, the variances are computed on the basis of sales value. This method will give the sales manager an idea of the effect of various factors affecting sales such as prices, quantity and sales mix on the overall sales value.

The sales value variances are more or less similar to material cost variances or labour cost variances.

1. Sales value variance : It is the difference between the budgeted sales and actual sales. The variance can be bifurcated into sales price variance and sales volume variance.

2. Sales price variance :

Actual quantity of Sales (Actual price – Budgeted price) or Actual sales minus actual quantity at budgeted prices.

3. Sales volume variances :

Budgeted price (Actual quantity – Budgeted quantity) or Actual quantity at budgeted price minus budgeted sales.

As in the case of materials, the sales volume variance can be bifurcated into sales mix variance and sales quantity variance. The former shows the difference in sales value due to the fact that the actual sales mix is different from what was expected as the budgeted mix.The latter shows the effect of total quantity being larger or smaller than what was budgeted.

4. Sales mix variance : For calculating the sales mix variance, we have to calculate the average budgeted price per unit of budgeted mix and the average budgeted price per unit of actual mix. The sales mix variance can then be calculated as below:

Total actual sales quantity (Budgeted price per unit of actual mix – Budgeted price per unit of budgeted mix)

5. Sales quantity variance :

Budgeted price per unit of budgeted mix (Actual total sales qty. – Budgeted total sales qty.)

Illustration

Compute the sales turnover variances from the following figures: -

Product	*Budget*		*Actual*	
	Quantity	*Price* Rs.	*Quantity*	*Price* Rs.
A	2,000	2.50	2,400	3.00
B	1,500	5.00	1,400	4.50
C	1,000	7.50	1,200	7.00

Solution

Basic calculation:

Product	*Budgeted price*	*Actual price*	*Budgeted quantity*	*Actual quantity*	*Budgeted sales*	*Actual quantity at budgeted sales Price*	*Actual sales*
	a	*b*	*c*	*d*	*(e)=a × c*	*f=(a × d)*	*g=(b × d)*
	Rs.	Rs.			Rs.	Rs.	Rs.
A	2.50	3.00	2,000	2,400	5,000	6,000	7,200
B	5.00	4.50	1,500	1,400	7,500	7,000	6,300
C	7.50	7.00	1,000	1,200	7,500	9,000	8,400
D	10.00	10.50	500	400	5,000	4,000	4,200
			5,000	5,400	25,000	26,000	26,100

Computation of Variances :

Sales price variance = Actual quantity (Actual price – Budgeted price)

= Actual sales – Standard sales

= Rs.26,100 – Rs. 26,000 = Rs.100(F)

Sales volume variance = Budgeted price (Actual quantity – Budgeted quantity)

= Std. sales – Budgeted sales

= Rs.26,000 – Rs.25,000 = Rs.1,000 (F)

Total variance = Actual sales – Budgeted sales

= Rs.26,100 – Rs.25,000 = Rs.1,100 (F)

The sales mix and the sales quantity variances are worked out as below:

Average budgeted price per unit of budgeted mix: $\frac{\text{Rs . 25,000}}{\text{5,000 units}}$ = Rs. 5.00

Average budgeted price per unit of actual mix : $\frac{\text{Rs . 26 ,000}}{\text{5,400 units}}$ = Rs. 4.815

Hence, **Sales mix variance** = Actual total qty. (Budgeted price per unit of actual mix – Budgeted price per unit of budgeted mix)
= 5,400 units (Rs.4.815—Rs.5.00)
= Rs. 1,000 (A)

Sales quantity variance = Budgeted price per unit of budgeted mix
= (Actual total qty. – Budgeted total qty.)
= Rs.5 (5,400 – 5,000) = Rs. 2,000 (F)

Note: Instead of computing average price, one may use total figures to do away with the effect of rounding off.

For example, in case of sales mix variance figures may be as under:

$$= 5{,}400 \text{ Units} \left(\frac{\text{Rs. } 26{,}000}{5{,}400 \text{ units}} - \frac{\text{Rs. } 25{,}000}{5{,}000 \text{ units}} \right)$$

= Rs. 26,000 – Rs 27,000 = Rs.1,000 (A)

(b) Profit or sales margin method: The purpose of measuring the variances under this method is to identify the effect of changes in sale quantities and selling prices on the profits of the company. The quantity and mix variances should be analysed in conjunction with each other because the sales manager is responsible for both of these variances. Where a company is engaged in the manufacture and sale of multiple products, the variances between budgeted sales and actual sales may arise due to the following reasons:

(a) Changes in unit price and cost.

(b) Changes in physical volume of each product sold. This is quantity variance.

(c) Changes in the physical volume of the more profitable or less profitable products.

This is mix variance.

There are five distinct variables that can cause actual performance to differ from budgeted performance. They are:

(a) Direct substitution of products.

(b) Actual quantity of the constituents of sales being different from the budgeted quantity.

(c) Actual total quantity being different from the budgeted total quantity.

(d) Difference between actual and budgeted unit cost.

(e) Difference between actual and budgeted unit sale price.

The sales management should consider particularly the interaction of more than one variable in making decisions. For example, decrease in selling price coupled with a favourable product quantity variance may help to assess the price elasticity of demand.

The formulae for the calculation of sales margin variances are as under:

(1) **Total Sales Margin Variance (TSMV):** It is the difference between the budgeted margin and the actual margin.

(2) **Sales Margin Price Variance (SMPV) :** This variance arises because of the difference between the budgeted price of the quantity actually sold and the actual price thereof.

SMPV = Actual quantity (Actual margin per unit – Budgeted margin per unit).

(3) **Sales Margin Volume Variance (SMVV) :** This variance arises because of the difference between the budgeted and actual quantities of each product both evaluated at budgeted margin.

SMVV = Budgeted margin per unit (Actual units – Budgeted units)

This can be further sub-divided into the following two variances:

(4) **Sales Margin Quantity Variance (SMQV):** This variance arises because of the difference between the budgeted total quantity and the actual total quantity and is ascertained by multiplying this difference by budgeted margin per unit of budgeted mix.

(5) **Sales Margin Mix Variance (SMMV):** This variance arises because of the change in the quantities of actual sales mix from budgeted sale mix and can be computed as below:

SMMV = Total actual quantity sold × (Budgeted margin per unit of actual mix - Budgeted margin per unit of budgeted mix).

Illustration 15

Compute the sales margin variances from the following data:

Products	*Budgeted quantity*	*Actual quantity*	*Budgeted sale price Rs.*	*Actual sale price Rs.*	*Standard cost per unit Rs.*
A	1,200	2,000	5.00	4.50	3.00
B	800	1,000	2.50	2.00	1.50

Solution

1. The margin for each product may be calculated as under:

Products	*Budgeted price* Rs.	*Actual price* Rs.	*Std. cost* Rs.	*Budgeted margin* Rs.	*Actual margin* Rs.
A	5.00	4.50	3.00	2.00	1.50
B	2.50	2.00	1.50	1.00	0.50

For computing the various sales margin variances the following calculations be made:

Products	*Margin*		*Quantity*		*Budgeted margin*	*Budgeted margin on actual sales*	*Actual margin*
	Budget	*Actual*	*Budget*	*Actual*			
	(a)	(b)	(c)	(d)	(e) = (a×c)	(f) = (a) × (d)	(g) = (b)× (d)
	Rs.	Rs.			Rs.	Rs.	Rs.
A	2.00	1.50	1,200	2,000	2,400	4,000	3,000
B	1.00	0.50	800	1,000	800	1,000	500
Total			2,000	3,000	3,200	5,000	3,500

Budgeted margin per unit of budgeted mix: $\frac{\text{Rs. } 3,200}{2,000 \text{ units}}$ = Rs. 1.60

Budgeted margin per unit of actual mix : $\frac{\text{Rs. } 5,200}{3,000 \text{ units}}$ = Rs. 1.667

Computation of Variances :

Sales margin price variance = Actual quantity (Actual margin–Budgeted margin)

= Actual margin – Budgeted margin on actual sale

= Rs.3,500 – Rs.5,000 = Rs. 1,500 (A)

Sales margin volume variance = Budgeted margin (Actual quantity – Budgeted quantity)

= Budgeted margin on actual sales – Budgeted margin.

= Rs.5,000 – Rs. 3,200 = Rs. 1,800 (F)

Total sales margin variance = Actual margin – Budgeted margin

= Rs.3,500 – Rs.3,200 = Rs. 300 (F)

The sales margin mix variance and sales margin quantity variance are worked out as under:

Sales margin mix variance = Total actual quantity sold (Budgeted margin per unit of actual mix – Budgeted margin per unit of budgeted mix)

= 3,000 units (Rs. 1.667 – Rs. 1.60) = Rs. 200 (F)

Sales margin quantity variance = Budgeted margin per unit of budgeted mix (Total actual quantity – Total budgeted quantity)

= Rs. 1.60 (3,000 – 2,000) = Rs. 1,600 (F)

The sales variances above have been calculated on the basis of both the methods, viz., turnover method and margin method. Students are advised to grasp both the methods. Further, mix and quantity variances have been calculated according to quantity technique.

Illustration 16

Stand cost Corporation produces three products A,B and C. The master budget called for the sale of 10,000 units of A at Rs. 12 6,000 units of B at Rs. 15 and 8,000 units of C at Rs.9. In addition, the standard variable cost for each product was Rs. 7 for A, Rs.9 for B and Rs.6 for C. Infact, the firm actually produced and sold 11,000 units of A at Rs.11.50, 5,000 units of B at Rs. 15.10 and 9,000 units of C at Rs. 8.55.

The firm uses two input to produce each of the products X and Y. The standard price of material X is Rs.2 and for a unit of material Y is Re. 1. The materials budgeted to be used for each product were :

Products	*Materials*	
	X *(units)*	Y *(units)*
A	2	3
B	4	1
C	1	4

The firm actually used 54,000 units of X at a cost of Rs. 1,09,620 and 72,000 units of Y at a cost of Rs. 73,000.

Required:

Determine the mix, quantity and rate variances for sales as well as the yield, mix and price variance for materials.

Solution

Sales variances (Sales Value Method)

Basic Calculations :

	Budgeted Sales			Actual Sales			Actual
Product	*Qty.*	*Rate*	*Amount*	*Qty.*	*Rate*	*Amount*	*Quantity × Budgeted price*
	Units	*Rs.*	*Rs.*	*Units*	*Rs.*	*Rs.*	*Rs.*
A	10,000	12	1,20,000	11,000	11.50	1,26,500	1,32,000
B	6,000	15	90,000	5,000	15.10	75,500	75,000
C	8,000	9	72,000	9,000	8.55	76,950	81,000
	24,000		2,82,000	25,000		2,78,950	2,88,000

Computation of sales variances :

(1) **Sales value variance** = Actual sales – Budgeted sales

= Rs. 2,78,950 – Rs. 2,82,000

= Rs. 3,050 (A)

(2) **Sales price variance** = Actual quantity (Actual price – Budgeted price)

= Rs. 2,78,950 – Rs. 2,88,000

= Rs. 9,050 (A)

(3) **Sales quantity variance** = Budgeted price (Actual Qty. –Budgeted Qty.)

= Rs. 2,88,000 – Rs. 2,82,000

= Rs. 6,000 (F)

(4) **Sales mix variance** = Total actual qty. (Budgeted price of actual mix – Budgeted price of budgeted mix)

$$= 25{,}000 \left(\frac{Rs.\ 2{,}88{,}000}{25{,}000\ units} - \frac{Rs.\ 2{,}82{,}000}{24{,}000\ units} \right)$$

= 25,000 units (Rs. 11.52 – Rs. 11.75)

Rs. 5,750 (A)

(5) **Sales sub quantity variance** = Budgeted price of budgeted mix (Total actual quantity – Total budgeted qty.)

= Rs. 11.75 (25,000 – 24,000)

= Rs. 11,750 (F)

Check

Sales value variance	=	Sales price variance + Sales quantity variance
Rs. 3,050 (A)	=	Rs. 9,050 (A) + Rs. 6,000 (F)
Sales quantity variance	=	Sales mix variance + Sales sub-quantity variance
Rs. 6,000 (F)	=	Rs. 5,750 (A) + Rs. 11,750 (F)

Alternative solution (sales margin method)

Basic calculations :

	Budgeted margin			*Actual margin*			*Actual quantity × Budgeted margin*
Product	*Qty.*	*Rate*	*Amount*	*Qty.*	*Rate*		*Amount*
	Units	R s	R s .	Units	R s .	R s	R s .
A	10,000	5	50,000	11,000	4.50	49,50	55,000
B	6,000	6	36,000	5,000	6.10	30,50	30,000
C	8,000	3	24,000	9,000	2.55	22,95	27,000
	24,000		1,10,000	25,000		1,02,95	1,12,000

Computation of variances:

Sales margin variance = Actual margin – Budgeted margin
= Rs. 1,02,950 – Rs. 1,10,000
= Rs. 7,050 (A)

Sales price margin variance = Actual quantity (Actual margin – Budgeted margin)
= Rs. 1,02,950 – Rs. 1,12,000 = Rs. 9,050 (A)

Sales margin mix variance = Total actual quantity (Budgeted margin of actual mix –Budgeted margin of budgeted mix)

$$= 25{,}000 \text{ units} \left(\frac{Rs.1{,}12{,}000}{25{,}000\ units} - \frac{Rs.1{,}10{,}000}{24{,}000\ units} \right)$$

= Rs. 2583 (A)

Sales margin sub quantity variance = Budgeted margin of budgeted mix × (Total actual Qty. –Total budgeted Qty.)

$$= \frac{\text{Rs. } 1{,}10{,}000}{24{,}000 \text{ units}} \text{ (25,000 units – 24,000 units)}$$

= Rs. 4,583 (F)

Material Variances :

Basic calculations

Standard and actual costs of material for actual output i.e. 11,000 units of A, 5,000 units of B and 9,000 units of C and standard cost of actual input material.

Material	*Standard cost*			*Actual cost*		*Actual quantity × standard price*	
	Qty Units	*Rate Rs.*	*Amount Rs.*	*Qty. Units*	*Rs.*	*Rate*	*Amount Rs.*
X	51,000*	2	1,02,000	54,000	1,09,620		1,08,000
Y	74,000**	1	74,000	72,000	73,000		72,000
	1,25,000		1,76,000	1,26,000	1,82,620		1,80,000

* 11,000 × 2 + 5,000 × 4 + 9,000 × 1 = 51,000

**11,000 × 3 + 5,000 × 1 + 9,000 × 4 = 74,000.

Computation of variances :

Material cost variance = Standard cost – Actual cost

= Rs. 1,76,000 – 1,82,620 = Rs. 6,620 (A)

Material price variance = Actual quantity (Standard price – Actual price)

= Rs. 1,80,000 – Rs. 1,82,620 = Rs. 2,620 (A)

Material mix variance = Total quantity (Standard price of standard mix – Standard price of actual mix)

$$= 1,26,000 \text{ units} \left(\frac{Rs.1,76,000}{1,25,000\ units} - \frac{Rs.1,80,000}{1,26,000\ units} \right)$$

= Rs. 2,592(A)

Material yield variance = Standard price of standard mix × (Total standard quantity – Total actual quantity)

$$= \frac{\text{Rs. } 1,76,000}{1,25,000 \text{ units}} \text{ (Rs.1,25,000 – Rs.1,26,000)}$$

= Rs. 1,408 (A)

Check:

Material cost variance = Material price variance + Material mix variance + Material yield variance

Rs. 6,620(A) = Rs. 2,620(A)+ Rs. 2,592(A) + Rs. 1,408(A)

Illustration 17

A. Trident Toys Ltd. had drawn up the following Sales Budget for August, 1998

'Bravo'Toys	5,000 units at Rs. 100 each
'Champion'Toys	4,000 units at Rs. 200 each
'Super 'Toys	6,000 units at Rs 180 each

The actual sales for August, 1998 were :

'Bravo'Toys	5,750 units at Rs. 120 each
'Champion'Toys	4,850 units at Rs. 180 each
'Super 'Toys	5,000 units at Rs. 165 each

The costs per unit of Bravo, Champion and Super Toys were Rs. 90, Rs. 170 and Rs. 130 respectively.

Analyse the variances to show :

(a) the effects on turnover :
  (i) Sales price variance
  (ii) Sales mix variance
  (iii) Sales quantity variance
  (iv) Total sales value variance

(b) the effects on profit :
  (i) Sales margin : Price variance
  (ii) Sales margin : Mix variance
  (iii) Sales margin : Quantity variance
  (iv) Total sales margin variance.

Solution

A. (a) Analysis of variances to show the effects on turnover : Working Notes :

(1) Budgeted sales :

Budgeted sales units at budgeted (or standard) prices.

	Units	*Price* Rs.	*Amount* Rs.
Bravo	5,000	100	5,00,000
Champion	4,000	200	8,00,000
Super	6,000	180	10,80,000
	15,000		23,80,000

(2) *Actual sales :*

Actual sales units at actual prices

	Units	*Price* Rs.	*Amount* Rs.
Bravo	5,750	120	6,90,000
Champion	4,850	180	8,73,000
Super	5,000	165	8,25,000
	15,600		23,88,000

(3) *Standard sales:*

Actual sales units at Budgeted (or Standard) prices.

	Units	*Price* Rs.	*Amount* Rs.
Bravo	5,750	100	5,75,000
Champion	4,850	200	9,70,000
Super	5,000	180	9,00,000
	15,600		24,45,000

Computation of Variances :

(i) Sales price variance = Actual quantity (Actual price – Budgeted price)

or

Actual sales – Standard sales

= Rs.23,88,000 – Rs.24,45,000 = Rs.57,000 (A)

(ii) Sales mix variance = Total actual quantity (Budgeted price of actual mix – Budgeted price of budgeted mix)

$$= 15{,}600 \text{ units} \left(\frac{\text{Rs. } 24{,}45{,}000}{15{,}600} - \frac{\text{Rs. } 23{,}80{,}000}{15{,}000} \right)$$

= Rs. 24,45,000 – Rs. 24,75,200 = Rs. 30,200 (A)

(iii) Sales quantity variance = Budgeted price of budgeted mix × (Total actual quantity – Total budgeted quantity)

$$= \frac{\text{Rs. } 23{,}80{,}000}{15{,}000 \text{ units}} (15{,}600 \text{ units} - 15{,}000 \text{ units})$$

= Rs. 24,75,200 – Rs. 23,80,000 = Rs. 95,200 (F)

(iv) Total sales value variance = Actual sales – Budgeted sales

= Rs.23,88,000 – Rs.23,80,000 = Rs. 8,000 (F)

(b) Analysis of variances to show the effects on profit :

Working Notes :

(1) *Budgeted margin per unit*

	Sales price	*Cost*	*Margin*
	Rs.	Rs.	Rs.
Bravo	100	90	10
Champion	200	170	30
Super	180	130	50

(2) *Actual margin per unit*

	Sales price	*Cost*	*Margin*
	Rs.	Rs.	Rs.
Bravo	120	90	30
Champion	180	170	10
Super	165	130	35

(3) *Budgeted profit*

	Units	*Margin*	*Total profit*
	Rs.	Rs.	Rs.
Bravo	5,000	10	50,000
Champion	4,000	30	1,20,000
Super	6,000	50	3,00,000
	15,000		4,70,000

(4) *Actual profit*

	Units	*Margin*	*Total profit*
	Rs.	Rs.	Rs.
Bravo	5,750	30	1,72,500
Champion	4,850	10	48,500
Super	5,000	35	1,75,000
	15,600		3,96,000

(5) *Standard profit*

	Actual quantity Rs.	*Budgeted margin* Rs.	*Total profit* Rs.
Bravo	5,750	10	57,500
Champion	4,850	30	1,45,500
Super	5,000	50	2,50,000
	15,600		4,53,000

Computation of variances:

(i) **Sale margin price variance**

Actual quantity (Actual margin – Budgeted margin)

or

Actual profit – Standard profit

Rs. 3,96,000 – Rs. 4,53,000 = Rs. 57,000 (A)

(ii) **Sales margin mix variance**

= Total actual quantity (Budgeted margin on actual mix – Budgeted margin on budgeted mix)

$$=15{,}600 \text{ units } \left(\frac{Rs.\ 4{,}53{,}000}{15{,}600\ units} - \frac{Rs.\ 4{,}70{,}000}{15{,}000\ units}\right)$$

= Rs. 4,53,000 – Rs. 4,88,800 = Rs. 35,800 (A)

(iii) **Sales quantity variance**

= Budgeted margin on budgeted mix (Total actual qty. – Total budgeted qty.)

$$= \frac{\text{Rs. } 4{,}70{,}000}{15{,}000 \text{ units}} (15{,}600 \text{ units} - 15{,}000 \text{ units})$$

= Rs. 4,88,800 – Rs. 4,70,000 = Rs. 18,800 (F)

(iv) **Total sales margin variance** = Actual profit – Budgeted profit

= Rs. 3,96,000 – Rs. 4,70,000 = Rs. 74,000 (A)

6.3.5 Market size and market-share variances :

Market size variance :

$$\begin{pmatrix} Budgeted \\ market \\ share \\ percentage \end{pmatrix} \times \begin{pmatrix} Actual \\ industry \\ sales\ volume \\ in\ units \end{pmatrix} - \begin{pmatrix} Budgeted \\ industry \\ sales\ volume \\ in\ units \end{pmatrix} \times \begin{pmatrix} Budgeted \\ average \\ contribution \\ margin \\ per\ unit \end{pmatrix}$$

Market share variance :

$$\begin{pmatrix}\text{Actual market share percentage} - \text{Budgeted market share percentage}\end{pmatrix} \times \begin{pmatrix}\text{Actual industry sales volume in units}\end{pmatrix} \times \begin{pmatrix}\text{Budgeted average contribution margin per unit}\end{pmatrix}$$

Illustration 18

Super computers manufactures and sells three related PC models :

1. PC — Sold mostly to college students
2. Portable PC— Smaller version of PC positioned as home computer
3. Super PC — Sold mostly to business executives

Budgeted and actual data for 1995 is as follows:

Budgeted for 1995

	Selling price per unit Rs.	*Variable cost per unit Rs.*	*Contribution margin per unit Rs.*	*Sales volume in units*
P C	24,000	14,000	10,000	7,000
Portable PC	16.000	10.000	6.000	1.000
Super PC	1,00,000	60,000	40,000	2,000
Total:				10.000

Actuals for 1995

	Selling price per unit (Rs.)	*Variable cost per unit (Rs.)*	*Contribution margin per unit (Rs.)*	*Sales volume in units*
P C	22,000	10,000	12,000	8,250
Portable PC	13,000	8,000	5,000	1,650
Super PC	70,000	50,000	20,000	1,100
Total :				11,000

Super computers derived its total unit sales budget for 1995 from the internal management estimate of a 20% market share and an industry sales forecast by computer manufacturers association of 50,000 units. At the end of the year the association reported actual industry sales of 68,750 units.

Required:

(i) Compute the individual product and total sales volume variance.

(ii) Compute total sales quantity variance.

(iii) Compute the market size and market share variances.

(iv) Compute individual product and total sales mix variances.

(v) Comment on your results.

Solution 18

Working Notes:

1. Statement of budgeted average contribution margin per unit for the year 1995

Products/ Different PC models	*Budgeted contribution margin per unit of each product (Rs.)*	*Budgeted sales volume (units)*	*Total budgeted contribution margin (Rs.)*
PC	10,000		
		7,000	7,00,00,000
Portable PC	6,000	1,000	60,00,000
Super PC	40,000	2,000	8,00,00,000
Total:		10,000	15,60,00,000

$$\text{Budgeted average contribution margin per unit} = \frac{\text{Rs. } 15,60,00,000}{10,000 \text{ units}}$$

$$= \text{Rs.}15,600.$$

2. Actual market share percentage $= \frac{\text{Actual sales of 3 – C models}}{\text{Actual industry sales}} = \times 100$

$$= \frac{11,000 \text{ units}}{68,750 \text{ units}} \times 100$$

$$= 16\%$$

3. Actual sales mix percentage of product $= \frac{\text{Actual sale of product}}{\text{Total Actual sale of 3 PC models}} \times 100$

Actual sales mix percentage of product PC $= \frac{8,250 \text{ units}}{11,000 \text{ units}} \times 100 = 75\%$

Actual sales mix percentage of product Portable PC $= \frac{1,650 \text{ units}}{11,000 \text{ units}} \times 100 = 10\%$

Actual sales mix percentage of product Super PC $= \frac{1,100 \text{ units}}{11,000 \text{ units}} \times 100 = 10\%$

(i) *Computation of individual product and total sales volume variance*

$$\text{Sales volume variance} = \begin{bmatrix} \text{Actual sales volume in units} - \text{Budgeted sales volume in units} \end{bmatrix} \times \text{Budgeted contribution margin per unit}$$

Individual product sales volume variance :

PC

= (8,250 units – 7,000 units) × Rs.10,000 = Rs. 1,25,00,000 (Fav.)

Portable PC

= (1,650 units – 1,000 units) × Rs.6,000 = Rs. 39,00,000 (Fav.)

Super PC

= (1,100 units – 2,000 units) × Rs.40,000 = Rs. 3,60,00,000 (Adv.)

Total sales volume variance = Rs. 1,96,00,000 (Adv.)

(ii) *Computation of total sales quantity variance:*

Total sales quantity variance:

$$= \begin{bmatrix} \text{Total actual sales units} - \text{Total budgeted sales units} \end{bmatrix} \times \text{Budgeted average contribution margin per unit}$$

= (11,000 units – 10,000 units) × Rs.15,600 = Rs.1,56,00,000 (Fav.)

(iii) *Computation of the market size and market share variances*

1. *Market size variance:*

$$= \text{Budgeted market share percentage} \begin{bmatrix} \text{Actual industry sales in units} - \text{Budgeted industry sales in units} \end{bmatrix} \times \text{Budgeted contribution margin per unit}$$

= 0.20 (68,750 units – 50,000 units) × Rs. 15,600

= Rs.5,85,00,000 (Fav.)

2. *Market share variance:*

$$= \begin{bmatrix}\text{Actual market}\\ \text{share percentage}\end{bmatrix} - \begin{bmatrix}\text{Budgeted market}\\ \text{share percentage}\end{bmatrix} \times \begin{bmatrix}\text{Actual}\\ \text{industry}\\ \text{sales}\\ \text{volume}\\ \text{in units}\end{bmatrix} \times \begin{bmatrix}\text{Budgeted average}\\ \text{contribution}\\ \text{margin per unit}\end{bmatrix}$$

= (0.16 – 0.20) × 68,750 units × Rs.15,600

= Rs.4,29,00,000 (Adv.)

(iv) Computation of individual product and total sales mix variances

1. *Individual product sales mix variance:*

Sales mix variance :

$$\begin{bmatrix}\text{Actual}\\ \text{sales mix}\\ \text{percentage}\\ \text{of product}\end{bmatrix} - \begin{bmatrix}\text{Budgeted}\\ \text{sales mix}\\ \text{percentage}\\ \text{of product}\end{bmatrix} \times \begin{bmatrix}\text{Actual}\\ \text{total}\\ \text{sales}\\ \text{volume}\\ \text{in units}\end{bmatrix} \times \begin{bmatrix}\text{Budgeted}\\ \text{individual}\\ \text{contribution}\\ \text{margin}\end{bmatrix} - \begin{bmatrix}\text{Budgeted average}\\ \text{contribution}\\ \text{margin}\end{bmatrix}$$

= (0.75 – 0.70) × 11,000 units × (Rs.10,000 – Rs.15,600) = Rs. 30,80,000 (Adv)

Portable PC ***

= (0. 15 – 0. 10) ×11,000 units × (Rs.6,000 – Rs.15,600) = Rs. 52,80,000 (Adv)

Super PC ***

= (0. 10 – 0.20) × 11,000 units × (Rs.40,000 – Rs.15,600) = Rs.2,68,40,000 (Adv)

Total sales mix variance = Rs. 3,52,00,000 (Adv.)

* Refer to working note 1.

** Refer to working note2.

*** Refer to working note 3.

Note: Sales variances can also be calculated by using sales value approach.

(v) Comment on above results:

1. Favourable sales quantity variance of Rs. 1.56 crores was because of growth in industry as a whole. However, the firm could not retain the budgeted market share of 20%.
   As a result the benefit of increased market size i.e. Rs.5.85 crores is partly offset by loss due to fall in market share i.e. Rs.4.29 crores.

2. Increase in the percentage sale of computers below-average budgeted margins and a decrease in the percentage sale of computers above-average budgeted margins had resulted in the reduction of operating profit by Rs.3.52 crores.

3. As a result of above, the operating profit of 'Super Computers' had been adversely affected by Rs.1.96 crores due to sales variances.

6.4 REPORTING OF VARIANCES

Computation of variances and their reporting is not the final step towards the control of various elements of cost. It infact demands an analysis of variances from the side of the executives, to ascertain the correct reasons for their occurance. After knowing the exact reasons, it becomes their responsibility to take necessary steps so as to stop the re-occurance of adverse variances in future. To enhance the utility of such a reporting system it is necessary that such a system of reporting should not only be prompt but should also facilitate the concerned managerial level to take necessary steps. Variance reports should be prepared after keeping in view its ultimate use and its periodicity. Such reports should highlight the essential cost deviations and possibilities for their improvements. In fact the variance reports should give due regard to the following points :-

(i) The concerned executives should be informed about what the cost performance should have been.

(ii) How close the actual cost performance is with reference to standard cost performance.

(iii) The analysis and causes of variances.

(iv) Reporting should be based on the principle of management by exception.

(v) The magnitude of variances should also be stated.

6.4.1 Standard cost reports : Standard cost reports showing the details of the variances are prepared for control purposes. Two such reports are illustrated below:

(a) Standard Costing Profit & Loss statement : A standard costing profit and loss statement will show the variance of each type under each element of cost department wise and is illustrated as below:

Standard Costing Profit and Loss Report Month _____19_____

Particulars	*Total*	*Dept. A*	*Dept. B*	*Dept. C*
A. Sales value				
B. *Less* : Standard cost of sales				
C. Standard profit				
D. Add / Deduct variances				
Materials : Price				
Usage				
Mix				
Revision				

Labour :	Rate of pay				
	Efficiency				
Overhead :	Efficiency				
	Calendar				
	Capacity				
	Expense				
Total					
E. Actual profit					

The adverse variance may be shown in red or in parenthesis.

(b) Material usage variance report :

This report is sent to the heads of departments for necessary corrective action. A typical report is as under:

Material Usage Variance Report - Dept. A

Month_____19 _____

Material	*Standard requirement*	*Actual consumption-*	*This month's variance*		*Cumulative variance*	
			Qty.	*Value*	*Qty.*	*Value*
	Kgs.	*Kgs.*	*Kgs.*	*Rs.*	*Kgs.*	*Rs.*
A	1,200	1,100	100	100	400	400
B	1,800	2,000	(200)	(100)	200	100
C	4,100	4,000	100	200	(500)	(1000)
D	1,000	950	50	25	75	38
Total				225		(462)

6.4.2 Preparation of Original Budget, Standard Product Cost Sheet and the Reconciliation of Budgeted Profit and Actual Profit : Generally, under variance analysis we compute various variances from the actual and the standard/budgeted data. Sometimes all or a few variances and actual data are made available and from that we are required to prepare standard product cost sheet, original budget and to reconcile the budgeted profit with the actual profit. Preparation of these statements is illustrated below :

Illustration 19

The budgeted output of a single product manufacturing company for the year ending 31st March was 5,000 units. The financial results in respect of the actual output of 4,800 units achieved during the year were as under:

	Rs.
Direct material	29,700

Direct wages	44,700
Variable overheads	72,750
Fixed overheads	39,000
Profit	36,600
Sales	2,22,750

The standard wage rate is Rs. 4.50 per hour and the standard variable overhead rate is Rs. 7.50 per hour.

The cost accounts recorded the following variances for the year:

Variances	*Favourable*	*Adverse*
	Rs.	Rs.
Material price	–	300
Material usage	–	600
Wage rate	750	–
Labour efficiency	–	2,250
Variable overhead expenses	3,000	–
Variable overhead efficiency	–	3,750
Fixed overhead expense	–	1,500
Selling price	6,750	–

Required:

(i) Prepare a statement showing the original budget.

(ii) Prepare the standard product cost sheet per unit.

(iii) Prepare a statement showing the reconciliation of originally budgeted profit and the actual profit.

Solution

Working Notes :

		Rs.
(a)	*Actual sales*	2,22,750
	Less : Price variance (Favourable)	6,750
	Standard sales	2,16,000
	Units sold	4,800

Budgeted price per unit: $= \frac{\text{Rs. } 2,16,000}{4,800 \text{ units}} = \text{Rs. } 45$

(b)	*Material used*		29,700
		Rs.	
	Less :Price variance (Adverse)	300	
	Usage variance (Adverse)	600	900
	Standard cost		28,800

Standard material cost per unit: $= \frac{\text{Rs. } 28,800}{4,800 \text{ units}} = \text{Rs. } 6$

(c)	*Direct wages spent*	44,700
	Add: Wage rate variance (Favourable)	750
		45,450
Less: Efficiency variance (Adverse)		2,250
	Standard wages	43,200

Standard wage rate per unit: $\frac{\text{Rs. } 43,200}{4,800 \text{ units}} = \text{Rs. } 9$

(d) *Standard direct wage rate is Rs.4.50 per hour.*

Hence standard time per unit: Rs. 9 ÷ 4.50 hour = 2 hours

(e) *Variable overheads :*

Standard rate Rs.7.50 per hour

Variable overhead per unit: 2 hrs. × Rs.7.50 = Rs. 15

(*Note* : Alternatively, this may be calculated by adjusting variances as in other cases).

(f)	Fixed overhead spent	Rs.39,000
	Less : Fixed overhead expense variance (Adverse)	Rs.1,500
	Budgeted overheads	Rs. 37,500

Std. fixed overhead rate per unit : $\frac{\text{Rs. } 37,500}{5,000 \text{ units}} = \text{Rs. } 7.50$

(g) *Fixed overhead recovered:* 4,800 units × Rs.7.50 = Rs.36,000

(h) *Fixed overhead volume variance*

Rs.36,000 – Rs.37,500 = Rs.1,500 (Adverse)

(i) Budgeted sales: 5,000 units × Rs.45 = Rs.2,25,000

(j) Standard sales: 4,800 units × Rs.45 = Rs.2,16,000

(k) Actual sales = Rs.2,22,750

(l) Sales volume variance: = Rs.9,000 (Adverse)
Rs. 2,16,000 – Rs.2,25,000

(m) Sales price variance:
Rs.2,22,750 – Rs.2,16,000 = Rs. 6,750 (Favourable)

(i) Original budget:

		Rs.
Budgeted sales : (A)	(5,000 units × Rs.45)	2,25,000
Budgeted costs		
Direct material	(5,000 units × Rs.6)	30,000
Direct wages	(5,000 units × Rs.9)	45,000
Variable overheads	(5,000 units × Rs.15)	75,000
Fixed overheads	(5,000 units × Rs.7.50)	37,500
Total budgeted costs : (B)		1,87,500
Profit : (A) – (B)		37,500

(ii) Standard product cost sheet per unit

	Rs.
Direct materials	6.00
Direct wages	9.00
Prime cost	15.00
Variable overheads	15.00
Fixed overheads	7.50
Total cost	37.50
Profit	7.50
Selling price	45.00

(iii) Statement showing Reconciliation of the original Budgeted Profit and the Actual Profit.

	Rs.	R s .
Budgeted profit		37,500
Less: Sales margin volume variance (Adverse)* or loss of profit on sales volume variance		
$= \text{Rs. } 9,000 \times 16\frac{2}{3}\%$ **		1,500
Standard profit		36,000

*Sales margin volume variance (Adverse)

(200 units × Rs.7.50 = Rs.1,500)

**Profit as % of selling price : $\text{Rs. } 7.50 \times \frac{100}{65} = 16\frac{2}{3}\%$

Add : Sales price variance (Favourable)		6,750
		42,750
Add: Favourable cost variances:		
Wage rate	750	
Variable overhead expenses	~~3,000~~	3,750
Less : Adverse cost variances		46,500
Material price	300	
Material usage	600	
Labour efficiency	2,250	
Variable overhead efficiency	3,750	
Fixed overhead expense	1,500	8,400
		38,100
Less: Fixed overhead volume variance (Adverse)		1,500
[See working note (h)]		
		36,600

Illustration 20

Jumbo Enterprises manufactures one product, and the entire product is sold as soon as it is produced. There are no opening or closing stocks and work-in-progress is negligible. The company operates a standard costing system and analysis of variances is made every month.

The standard cost card for the product is as follows :–

		Rs.
Direct material	0.5 kgs. at Rs. 4 per kg.	2.00
Direct wages	2 hours at Rs. 2 per hour	4.00
Variable overheads	2 hours at Re. 0.30 per hour	0.60
Fixed overheads	2 hours at Rs. 3.70 per hour	7.40
Standard cost		14.00
Standard profit		6.00
Standard selling price		20.00

Selling and administration expenses are not included in the standard cost, and are deducted from profit as a period cost.

Budgeted output for April 1997 was 5,100 units.

Actual results for April 1997 were as follows :

Production of 4,850 units was sold for Rs. 95,600

Material consumed in production amounted to 2,300 kgs. at a total cost of Rs. 9,800.

Labour hours paid for amounted to 8,500 hours at a cost of Rs. 16,800.

Actual operating hours amounted to 8,000 hours. Variable overheads amounted to Rs. 2,600.

Fixed overheads amounted to Rs. 42,300.

Selling and administration expenses amounted to Rs. 18,000. You are required to

(a) Calculate all variances.

(b) Prepare an operating statement for the month ended 30th April 1997.

Solution

(a) Calculation of Variances:

(i) **Material price variance** = Actual quantity (Std. rate – Actual rate)
= Rs. 9,200 – Rs. 9,800 = Rs. 600 (A)

(ii) **Material usage variance** = Std. rate (Std. quantity – Actual quantity)
= Rs. 4 (2,425 kg. – 2,300 kg.)
= Rs. 500 (F)

(iii) **Labour rate variance** = Actual hours (Std. rate – Actual rate)
= Rs. 17,000 – Rs. 16,800 = Rs. 200 (F)

(iv) **Labour efficiency variance** = Std. rate (Std. hours – Actual hours)
= Rs. 2 (9,700 – 8,000)
= Rs. 3,400 (F)

(v) **Labour idle time variance** = Std. rate × Idle time
= Rs. 2 × 500 hrs = Rs. 1,000 (A)

(vi) **Variable overheads expenditure variance**
= (Budgeted variable overheads –Actual variable overheads)
= (8,000 hrs. × Re. 0.30) – Rs. 2,600.

= Rs. 200 (A)

(vii) **Variable overheads efficiency variance:**

= Std. rate (Std. hours – Actual hours)

= Re. 0.30 (9,700 – 8,000)

= Rs. 510 (F)

(viii) **Fixed overhead expenditure variance :**

= (Budgeted fixed overheads – Actual fixed overheads)

= (5,100 units × Rs. 7.40) – Rs. 42,300

= Rs. 4,560 (A)

(ix) **Fixed overheads volume variance:**

= Budgeted fixed overheads per unit (Budgeted volume – Actual volume)

= Rs. 7.40 (5,100 units – 4,850 units)

= Rs. 1,850 (A)

(x) **Fixed overheads efficiency variance :**

= Budgeted fixed overheads per hour (Std. hrs. – Actual hrs.)

= Rs. 3.70 (9,700 hrs. – 8,000 hrs.)

= Rs. 6,290 (F)

(xi) **Fixed overheads capacity variance:**

= Budgeted fixed overheads per hour (Budgeted capacity – Actual capacity)

= Rs. 3.70 {(5,100 × 2) – 8,000)}

= Rs. 8,140 (A)

(xii) **Sales price variance** = Actual qty. (Budgeted rate – Actual rate)

= Rs. 97,000 – Rs. 95,600 = Rs. 1,400 (A)

(xiii) **Sales volume variance** = Std. profit per unit (Budgeted sales volume – Actual sales volume)

= Rs. 6 (5,100 – 4,850)

= Rs. 1,500 (A)

(b) Operating Statement for the month ended 30th April 1997 :

Budgeted profit before selling & administration expenses		Rs.	Rs.
(5,100 units × Rs. 6)			30,600
Sales variances :			
Price	1400(A)		
Volume	1500(A)		2,900(A)
Actual sales minus standard cost of sales			27,700
Cost variances:		(F) Rs.	(A) Rs.
Material price		–	600
Material usage		500	–
Labour rate		200	–
Labour efficiency		3,400	–
Labour idle time		–	1,000
Variable overheads expenditure		–	200
Variable overheads efficiency		510	–
Fixed overheads expenditure		–	4,560
Fixed overheads efficiency		6,290	–
Fixed overheads capacity		–	8,140
		10,900	14,500 3,600 (A)
Actual profit before selling & administration expenses			24,100
Less: Selling & administration expenses			18,000
Actual profit for the month			6,100

Note: A = Adverse F = Favourable.

Check (Not required) :

		Rs.	Rs.
Sales			95,600
Less :	Cost of materials	9,800	
	Labour	16,800	
	Variable overheads	2,600	
	Fixed overheads	42,300	
	Selling &Adm. expenses	18,000	89,500
	Net profit		6,100

Illustration 21

The working results of a company for two corresponding years are shown below:

	Year 1	*Year 2*
	Rs. in lakhs	*Rs. in lakhs*
Sales	1,200	1,540
Direct Material	600	648
Direct Wages and Variable Overheads	360	412
Fixed Overheads	160	300
	1,120	1,360
Profit	80	180

In year 2, there has been an increase in the selling price by 10%. Following are the details of material consumption and utilization of direct labour hours during the two years.

	Year 1	*Year 2*
Direct Material Consumption in m/t	5,00,000	5,40,000
Direct Labour Hours	75,00,000	80,00,000

You are required to :

(i) Keeping year 1 as base year, analyse the results of year 2 and work out the amount which each factor has contributed to change in profit.

(ii) Find out the break even sales for both years.

(iii) Calculate the percentage increase in selling price that would be needed over the sale value of year 2 to earn a margin of safety of 45%.

Solution

(i) Reconciliation statement showing which factor has contributed change in profit

(Rs. in lacs)

	Favourable	*Adverse*
Increase in contribution due to increase in volume (*Rs.280 lacs – Rs.240 lacs*) (*Refer to working note 3*)	40	—
Sales price variance (*Refer to working note 3*)	140	

Material usage variance (*Refer to working note 4*)	52	
Material price variance (*Refer to working note 4*)	—	0
Direct labour rate variance (*Refer to working note 4*)	—	28
Direct labour efficiency variance (*Refer to working note 4*)	36	—
Fixed overhead expenditure variance (*Refer to working note 3*)	—	140
	268	168
Total change in profit	100	

(ii) Break-even sales (Year 1) (*Refer to working note 3*)

$$= \frac{\text{Fixed cost}}{\text{P/V ratio}}$$

Break-even sales (Year 2) (*Refer to working note 3*)

$$= \frac{Rs.\,300\ lacs}{\left(\frac{Rs.\,480\ lacs}{Rs.\,1,540\ lacs}\right)\times 100} = \text{Rs. 962.50 Lacs}$$

(iii) **Percentage increase in selling price needed over the sales value of year 2 to earn a margin of safety of 45% in year 2.**

P/V ratio = (Rs. 480 lacs/Rs. 1,540 lacs) × 100 = 31.169%

Break-even sales (*as % to sales*)

$$= \frac{\text{Rs. 962.50 lacs}}{\text{Rs. 1,540 lacs}} \times 100 = 62.5\%$$

If Margin of safety to be earned is 45% then Break-even point should be 55%

Contribution increase required

$$= \frac{62.5 \times 31.169}{55} \times 100 = 35.4193\%$$

Revised contribution = 1,540 lacs × 35.4193% = 545.45 lacs

Present contribution = Rs. 480 lacs

Increase in selling price required = Rs. 65.45 lacs (Rs. 545.45 lacs – Rs. 480 lacs)

Percentage increase in selling price

over the sales value of year 2 $= \frac{\text{Rs. 65.45 lacs}}{\text{Rs. 1,540 lacs}} \times 100 = 4.25\%$

Working notes :

1. Budgeted sales in year 2

If actual sales in year 2 is Rs. 110 then budgeted sales is Rs. 100.

If actual sales in year 2 is Re.1 then budgeted sales $= \frac{\text{Rs. 100}}{\text{Rs. 110}}$

If actual sales in year 2 are Rs.15,40,00,000 then budgeted sales are

$$= \frac{\text{Rs. 100}}{\text{Rs. 110}} \times \text{Rs. 15,40,00,000} = \text{Rs.1,400 Lacs.}$$

2. Budgeted figures of direct material; direct wages; and variable overhead worked out on the basis of % of sales in year 2 :

Direct material % to sales (in year 1) $= \frac{\text{Direct material cost}}{\text{Sales}} \times 100$

$$= \frac{600}{1,200} \times 100 = 50\%$$

Budgeted figure of direct material (in year 2) = 50% × Rs. 1,400 lacs = 700 lacs

Direct wages and variable overhead (% to sales in year 1) $= \frac{\text{Direct wages and var iable overhead}}{\text{Sales}}$

$$= \frac{360}{1,200} \times 100 = 30\%$$

Budgeted figure of direct wages and variable overhead (in year 2) = 30% × 1,400 lacs = 420 lacs

3. Statement of figures extracted from working results of a company

(*Figure in lacs of Rs.*)

	Year 1 Actual	Year 2 (Budgeted)	Year 2 Actual	Tot Varianc
	(a)	(b)	(c)	d = (c) – (b)
Sales : (A)	1,20	1,400	1,540	140
Variable costs :		(*Refer to working note 1*)		
Direct material (Fav.) (*Refer to working note 2*)	600	700	648	52
Direct wages and variable overhead (Fav.) (*Refer to working note 2*)	360	420	412	8
Total variable costs : (B)	960	1,120	1,060	60(Fav.)
Contribution (C) = {(A) – (B)}	240	280	480	200 (Fav.)
Less : Fixed cost	160	160	300	140 (Adv.)
Profit	80	120	180	60(Fav)

(4) (i) Data for Material variances :

Standard data for actual output			**Actual data**		
Quantity of material m/t	*Rate per m/t*	*Amount*	*Quantity of material m/t*	*Rate per m/t*	*Amount*
	Rs.	*Rs.*		*Rs.*	*Rs.*
5,83,333	120	700 lacs	5,40,000	120	648 lacs

Material price variance

= (Standard rate – Actual rate) Actual quantity = Nil

Material usage variance

= (Standard quantity – Actual quantity) Standard rate per m/t

= (5,83,333 – 5,40,000) Rs.120 = Rs. 52 lacs (Fav.)

(ii) Data for labour variances overhead variances

Standard data for actual output			Actual data		
Labour hours	*Rate per Hour* Rs.	*Amount* Rs.	*Labour hours*	*Rate per hour* Rs.	*Amount* Rs.
87,50,000	4.80	4.20 lacs	80,00,000	5.15	412 lacs

Labour rate variance :

= (Standard rate – Actual rate) Actual labour hours

= (Rs.4.80 – Rs.5.15) 80,00,000 = Rs. 28 lacs (Adv.)

Labour and variable overhead efficiency variance :

= {Standard labour hours – Actual labour hours} × Standard rate per hour

= {87,50,000 – 80,00,000} Rs. 4.80 = Rs. 36 lacs (Adv.)

Illustration 22

Ravi, Richard, Rahim and Roop Singh are regional salesmen distributing the product of Super Perfumes Ltd. The selling price of the product is Rs. 400 per unit. The sales quota and the standard selling expenses for the year are : -

Salesmen	*Sales quota* Rs.	*Standard selling expenses* Rs.
Ravi	7,50,000	2,25,000
Richard	9,00,000	2,47,500
Rahim	11,50,000	2,87,500
Roop Singh	6,00,000	2,25,000

Actual data for the year were as follows : -

	Ravi	*Richard*	*Rahim*	*Roop Singh*
Days on field work	200	175	225	250
Kilometres covered	20,000	18,000	18,000	30,000
	Rs.	Rs.	Rs.	Rs.
Sales	8,00,000	10,00,000	10,50,000	5,20,000
Salary	80,000	80,000	80,000	80,000
Free samples	9,000	7,500	5,375	8,000
Postage and stationery	8,000	9,000	10,000	6,000
Other expenses	9,000	5,000	4,000	10,000

The salesmen are allowed conveyance allowance of Rs. 1.50 per kilometre and a daily allowance of Rs. 80 per day for the days spent on field work. Ravi gets a commission of 6 percent on sales and others are given a commission of 5 percent on sales. Corporate sales office expenses are chargeable at the rate of Rs. 30 per unit sold in the case of Ravi and Richard and Rs. 40 per unit in the case of Rahim and Roop Singh. Prepare a schedule showing the selling cost variances by salesmen.

Solution

(b) Working notes:

		Ravi	Richard	Rahim	Roop Singh
(i)	*Standard sales units :*	1,875	2,250	2,875	1,500
	Sales quota ÷ Rs. 400				
(ii)	*Standard selling expenses per unit (Rs.)*	120	110	100	150
	(Std. selling expenses/Std. sales units)				
(iii)	*Actual sales units :*	2,000	2,500	2,625	1,300
	Actual sales ÷ Rs. 400				
(iv)	*Actual selling costs*	Rs.	Rs.	Rs.	Rs.
	Daily allowance	16,000	14,000	18,000	20,000
	Conveyance allowances	30,000	27,000	27,000	45,000
	Salaries	80,000	80,000	80,000	80,000
	Free samples	9,000	7,500	5,375	8,000
	Postage & stationery	8,000	9,000	10,000	6,000
	Other expenses	9,000	5,000	4,000	10,000
	Commission on sales	48,000	50,000	52,500	26,000
	Corporate sales office expenses	60,000	75,000	1,05,000	52,000
	Total actual selling cost	2,60,000	2,67,500	3,01,875	2,47,000
(v)	*Standard selling cost* (Actual units sold × Std. selling expenses per unit)	2,40,000	2,75,000	2,62,500	1,95,000

Since all the selling expenses have been related to sales units, only one variance can be calculated by comparing the standard and actual selling costs as is shown in the schedule below:

Schedule showing the selling cost variances by salesman

					Total
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Standard selling expenses (Refer to Working Note (v))	2,40,000	2,75,000	2,62,500	1,95,000	9,72,500
Actual selling expenses (Refer to Working Note (iv))	2,60,000	2,67,500	3,01,875	2,47,000	10,76,375
Selling cost variance	(20,000) (A)(F)	7,500	(39,375) (A)	(52,000) (A)	(1,03,875)

A = Adverse

F = Favourable

6.5 ACCOUNTING PROCEDURE FOR STANDARD COST

The standard cost operations can be recorded in the books of account. Two important accounting procedures for standard costs are :-

6.5.1 Partial plan : This system uses current standards in which the inventory will be valued at current standard cost figure. Under this method the work-in-progress account is charged at the actual cost of production for the month and is credited with the standard cost of the month's production of finished product. The closing balance of work-in-progress is also shown at standard cost. The balance after making the credit entries represent the variance from standard for the month. The analysis of the variance is done after the end of the month. This method is simple in operation because variances are analysed after the end of month but may present difficulties if the firm makes a variety of products. The following illustration will explain the operation of the recording of standard cost under this method.

Illustration 24

Material purchased 10,000 pieces at Rs. 1.10 — Rs. 11,000

Materials consumed 9,500 pieces at Rs. 1.10 — Rs. 10,450

Actual wages paid 2,475 hours at Rs. 3.50 — Rs. 8,662.50

Actual factory expenses incurred Rs. 17,000 (Budgeted Rs. 16,500)

Units produced: 900 units and sold at Rs. 60 per unit.

The standard rates and prices are as under: Direct materials Re. 1.00 per unit

Standard input 10 pieces per unit

Direct labour rate Rs. 3.00 per hour

Standard requirement 2.5 hours per unit

Overheads Rs. 6.00 per labour hour

Solution

(A) The cost sheet for 900 units will appear as under :

Cost	*Std. qty.*	*Std. rate*	*Std.cost*
			Rs.
Direct material	9,000	1.00	9,000
Direct labour	2,250	3.00	6,750
Overheads	2,250	6.00	13,500
			29,250

(B) Calculation of variances:

Material price variance = 9,500 Pcs. (Re. 1.00 – Rs.1.10) = Rs. 950 (A)

Material usage variance = Re. 1.00 (9,000 pcs. – 9,500 pcs.) = Rs. 500 (A)

Labour rate variance = 2,475 hrs. (Rs. 3.00 – Rs. 3.50)

= Rs. 1,237.50 (A)

Labour efficiency variance = Rs. 3.00 (2,250 hrs. – 2,475 hrs.) = Rs. 675(A)

Overhead variances :

(a) Charged to production as per cost sheet Rs. 13,500

(b) Actual hours × Std. rate: 2,475 hrs. × Rs. 6 Rs. 14,850

(c) Overheads as per budget Rs. 16,500

(d) Actual overheads Rs. 17,000

Efficiency variance :	(a – b)	Rs. 1,350 (A)
Capacity variance :	(b – c)	Rs.1,650 (A) (idle time)
Expense variance :	(c – d)	Rs. 500 (A)
Total variance :	(a – d)	Rs. 3,500 (A)

(C) The. journal entries for recording these transactions are as under :

			Dr. Rs.	Cr Rs.
(i)	Material Control A/c	Dr.	11,000	
	To General Ledger Adjustment A/c			11,000
	(Being the purchase value of 10,000 pieces of materials at Rs. 1.10 each)			
(ii)	Work-in-Progress A/c	Dr.	10,450	
	To Material Control A/c			10,450
	(Being the cost of 9,500 pieces of materials actually issued to production at the actual price of Rs. 1.10 each)			
(iii)	Work-in-Progress A/c	Dr.	8,662.50	
	To Wages Control A/c			8,662.50
	(Being the actual amount of direct wages paid for 2,475 hours at Rs. 3.50 per hour,			
(iv)	Work-in-Progress A/c	Dr.	17,000	
	To Overhead Expense Control A/c			17,000
	(Being the actual overhead expenses incurred)			
(v)	Finished Stock Control A/c	Dr.	29,250	
	To Work-in-Progess A/c			29,250
	(Being the standard cost of production transferred to finished goods account)			
(vi)	Cost of Sales A/c	Dr.	29,250	
	To Finished Stock Control A/c			29,250
	(Being the standard cost of goods sold transferred to Cost of Sales A/c)			

After the basic transactions are posted, the materials control account will show the actual value of stock of material in hand and the work-in-progress account will show a balance representing the cumulative variances on all the accounts and closing balance of work-in-progress at standard cost. The variances have already been analysed in Para (B) above

and they will be carried to the respective accounts pending investigation before being finally disposed off. In this problem we have assumed that there is no closing balance of work-in-progress.

(D) The journal entries for transferring the variances to their respective accounts are as under

			Rs.	Rs.
Material price variance A/c	Dr.	950.00		
Material usage variance A/c	Dr.	500.00		
Labour rate variance A/c	Dr.	1,237.50		
Labour efficiency variance A/c	Dr.	675.00		
Overhead efficiency variance A/c	Dr.	1,350.00		
Overhead capacity variance A/c	Dr.	1,650.00		
Overhead expense variance A/c	Dr.	500.00		
To work-in-progress A/c				6,862.50

(E) The ledger accounts will appear as under:

Dr. **Material Control A/c** Cr.

	Rs.		Rs.
To Opening balance	-	By Work-in-Progress A/c	10,450
To General Ledger		By Balance c/d	550
Adjustment A/c	11,000		
	11,000		11,000

Work-in-Progress Control A/c

	Rs.		Rs.
To Opening balance	–	By Finished stock control A/c	29,250.00
To Material control A/c	10,450.00	By material price variance A/c	950.00
To Wages control A/c	8,662.50	By material usage variance A/c	500.00
To Overheads control A/c	17,000.00	By labour rate varianve A/c	1,237.50
		By labour efficiency variance A/c	675.00
		By overhead efficiency A/c Variance A/c	1,350.00
		By overhead capacity Variance A/c .	1,650.00
		By overhead expense Variance A/c	500.00
	36,112.50		36,112.50

6.5.2 Single Plan : The main purpose of standard costing is cost control. To achieve this purpose, the variances should be analysed according to their causes. Analysis should be timely so that much time is not lost in taking corrective action wherever needed. In the partial plan, we have seen that the variances are analysed at the end of period. The single plan system envisages the posting of all items in the debit side of the work-in-progress account at the standard cost leaving the credit side to represent the standard cost of finished production and work-in-progress. This system enables the ascertainment of variances as and when the transaction is posted to work-in-progress account. In other words, the analysis of variances is done from the original documents like invoices, labour sheets, etc., and this method of analysis is known as analysis at source. Since, the single plan system contemplates the analysis of variances at source, the installation of this system requires more planning so that effective documentation at each stage is introduced for proper recording and analysis of variance. Thus for example, the issue of bill of materials to the stores enables the storekeeper to calculate the standard value of materials. If any material is requisitioned beyond the standard, he can mark the same for material usage variance account. In the production department, as and when the finished output is recorded, the standard waste and actual waste can be compared and necessary entries can be made by the shop supervisors for posting the excessive usage to appropriate variance accounts.

Scheme of entries : So far as materials are concerned, material price variances are recorded at the time of receipt of the material and the material quantity variances are recorded as far as possible when excess materials are used. The entries will be as illustrated below:

1. Dr. Material Control A/c

   Dr. or Cr. Material Price Variance A/c

   Cr. Creditors A/c.

This entry enables the firm to debit the material control account with the actual purchases at standard cost and credit the creditor 's account at the actual cost of actual prices thereby transferring the variances to price variance account.

2. Dr. Work-in-progress Control A/c

   Dr. or Cr. Material Usage Variances A/c

   Cr. Material Control A/c

This entry charges the work-in-progress control account with the standard cost of standard quantity and credit the material control account at the standard cost of actual issue, the variance being transferred to usage variance account.

3. Dr. Wages Control A/c

   Dr./Cr. Labour Rate Variances A/c

   Cr. Cash

This entry is passed to record the wages at standard rate thereby transferring rate variances to the appropriate account.

4. Dr. Work-in-progress Control A/c

   Dr. or Cr. Overhead Expense Variances A/c

   Cr. Overhead Expense Control A/c.

The complete procedure in recording the transactions under this system is given in the following illustration:

Illustration 25

Standard cost sheet per unit output is as under		Rs.
Direct material 3 pcs. @ Rs. 2.15		6.45
Direct Labour:		
Dept. A 2 hrs @ Rs. 1.75	3.50	
Dept. B 4 hrs. @ Rs. 1.50	6.00	9.50
Overheads :		
Dept. A 2 hrs. @ Re. 0.50	1.00	
Dept. B 4 hrs. @ Re. 1.00	4.00	5.00
		20.95

Transactions for the period are as under :

Materials purchased and consumed:

8,600 pcs. @ Rs. 2.50 each

Labour time spent

Dept. A. 5,200 hours

Dept. B. 12,000 hours

There is no change in labour rates.

Actual factory overheads are :

Dept. A. Rs. 3,000

Dept B. Rs. 12,500

Units produced:

Dept. A. 2,800

Dept. B. 2,800

Budgeted overheads:

Dept. A. Rs. 3,000

Dept. B. Rs. 12,000

Solution

(A) Computation of variance:

(i) **Material price variance:** 8,600 pcs. (Rs. 2.15 – Rs. 2.50) = Rs. 3,010 (A)

(ii) **Material usage variance:** Rs. 2.15 (8,400 Pcs. – 8,600 Pcs.) = Rs. 430 (A) [Standard requirement of materials = 2,800 units produced × 3 pcs. per unit = 8,400 pcs.]

(iii) **Labour efficiency variance:**

Dept. A: Standard time required = 2,800 pcs. × 2 hrs. = 5,600 hours.

Dept. B: Standard time required = 2,800 pcs. × 4 hrs. = 11,200 hours.

Variances :

Dept. A: 1.75 (5,600 – 5,200) = Rs. 700 (F)

Dept. B: 1.50 (11,200 – 12,000) = Rs. 1,200 (A)

(iv) Overheads variances:

(a) Charged to production:

	Dept. A	*Dept. B*	*Total*
	Rs .	*Rs .*	*Rs.*
Dept. A. 5,600 × 0.50	2,800		
Dept. B. 11,200 × 1.00		11,200	14,000
(b) Actual hours at std. rate :			
Dept. A. 5,200 × 0.50	2,600		
Dept. B. 12,000 × 1.00		12,000	14,600
(c) Budgeted overheads	3,000	12,000	15,000
(d) Actual expense	3,000	12,500	15,500
Efficiency variance : (a – b)	200(F)	800(A)	600(A)
Capacity variance : (b – c)	400(A)	–	400(A)
Expense variance : (c – d)	–	500(A)	500(A)
Total variance : (a – d)	200(A)	1,300(A)	1,500(A)

(B) Journal entries :

			Dr. Rs.	Cr. Rs.
(i)	Material Control A/c	Dr.	18,490	
	Material price variance A/c	Dr.	3,010	
	To Creditors A/c			21,500
(ii)	Work-in-Progress Dept. A. A/c	Dr.	18,060	
	Material usage variance A/c	Dr.	430	
	To Material Control A/c			18,490
(iii)	Work-in-progress Dept. A. A/c	Dr.	9,800	
	To wages control A/c			9,800
(iv)	Wages Control A/c	Dr.	700	
	To Labour Efficiency Variance Dept A A/c			700
(v)	Work-in-Progress Dept. B A/c.	Dr.	16,800	
	Labour Efficiency Variance Dept. B A/c	Dr.	1,200	
	To Wages Control A/c			18,000
(vi)	Work-in-Progress Dept. A A/c	Dr.	2,800	
	Overhead Capacity Variance Dept. A. A/c	Dr.	400	
	To Overhead Efficiency Variance Dept. A. A/c			200
	To Overhead Expense Control Dept. A A/c			3,000
(vii)	Work-in-Progress Dept. B A/c	Dr.	11,200	
	Overhead Efficiency Variance A/c	Dr.	800	
	Overhead Expenses Variance A/c	Dr.	500	
	To Overhead Control Dept. B A/c			12,500
(viii)	Work-in-Progress Dept. B A/c	Dr.	30,660	
	To Work-in-Progress Dept. A A/c			30,660
	(Being the transfer at standard cost of finished Production of Department A to Department B for processing in Department B)			
(ix)	Finished Stock control A/c	Dr.	58,660	
	To Work-in-Progress Dept. B A/c			58,660

(C) Ledger Accounts:

Dr.	Material Control A/c			Cr.
	Rs.			Rs.
To Creditors	18,490	By Work-in-Progress (Dept. A) A/c		18,060
By Material usage variance A/c	430			
	18,490			18,490

Dr.	Wages Control A/c			Cr.
	Rs.			Rs.
To Cash		By Work-in-Progress (Dept. A) A/c		9,800
(or Wages payable A/c)	27,100	By Work-in-Progress (Dept. B)A/c		16,800
To Labour efficiency	700	By Labour efficiency variance		
Variance (Dept, A) A/c		(Dept. B) A/c		1,200
	27,800			27,800

Dr.	Work-in-Progress (Dept. A) Control A/c			Cr.
	Rs.			Rs.
To Material Control A/c	18,060	By Work-in-Progress (Dept.B) A/c		30,660
To Wages Control A/c	9,800			
To Overhead Control	2,800			
(Dept. A) A/c	30,660			30,660

Dr.	Work-in-Progress (Dept. B) Control A/c			Cr.
	Rs.			Rs.
To Work-in-Progress		By Finished Stock.Control A/c		58,660
		(Dept. A) A/c		30,660
To Wages Control A/c	16,800			
To Overhead Control				
(Dept. B) A/c	11,200			
	58,660			58,660

Dr.	Overhead Expense Control (Dept. A) A/c			Cr.
	Rs.			Rs.
To Cash	3,000	By Work-in-Progress (Dept. A) A/c		2,800
To Overhead Efficiency Variance A/c	200	By Overhead Capacity Variance A/c		400
	3,200			3,200

Dr.	Material Price Variance A/c		Cr.
	Rs.		Rs.
To Creditros	3,010	By Costing P & L A/c	3,010

Dr.	Material Usage Variance A/c		Cr.
	Rs.		Rs.
To Material Control A/c	430	By Costing P & L A/c	430

Dr.	Labour Efficiency Variance A/c		Cr.
	Rs.		Rs.
To Wages Control A/c	1,200	By Wages Control A/c	700
(Efficiency of Dept. B)		By Costing P & L A/c	500
	1,200		1,200

Dr.	Overhead Efficiency Variance A/c		Cr.
	Rs.		Rs.
To Overhead Expenses		By Overhead Exp. Control	
Control (Dept. B) A/c	800	(Dept. A) A/c	200
		By Costing P & L A/c	600
	800		800

Dr.	Overhead Capacity Variance A/c		Cr.
	Rs.		Rs.
To Overhead Expenses	400	By Costing P & L A/c	400
Control (Dept. A) A/c			

Dr.	Overhead Expenses Variance A/c		Cr.
Rs.	Rs.		
To Overhead Expenses	500	By Costing P & L A/c	500
Control (Dept. B) A/c			

Dr.	Creditors A/c		Cr.
	Rs.		Rs.
To Balance	21,500	By Material Control A/c	18,490
By Material Variance A/c	3,010		
	21,500		21,500

Dr.	Overhead Expenses Control (Dept 'B') A/c		Cr.
	Rs.		Rs.
To Cash	12,500	By Work-in-Progress Dept. A A/c	11,200
		By Overhead Efficiency Variance (Dept. B) A/c	800
		By Overhead Expenses Variance (Dept. B) A/c	500
	12,500		12,500

Dr.	Finished Stock Control A/c		Cr.
	Rs.		Rs.
To Work-in-Progress Dept. B A/c	58,660	By Balance c/d	58,660

Recapitulation :

(1) Current standards are used in both the systems.

(2) Under the partial plan, material stocks are carried at actual cost whereas the same are carried out at standard cost under the single plan.

(3) The work-in-progress and finished goods are valued at standard cost under both the methods.

(4) *Computation of variances :*

(a) In partial plan, material price variance is computed on material used in finished goods and work-in-progress whereas in single plan it is computed on the material quantity purchased.

(b) The partial plan is suitable where simple analysis of variance is sufficient at the end of the period whereas the single plan is preferred if frequent detailed analysis of variance is desired, as (a) the comparison of actual with standard cost of each operation or operator or (b) the daily reporting of standard cost of excess material used.

6.6 BEHAVIOURAL ASPECTS OF STANDARD COSTING

1. *Projection of fixed overheads and estimated selling price in a Standard Cost Sheet is a circular exercise with no added value.*

In an award winning article," COST / MANAGEMENT ACCOUNTING: THE 21ST CENTURY PARADIGM", published in Management Accounting (USA), December 1995, William L Ferrara argues that while preparing a Standard Cost Sheet, one of the objectives of which is to assist management in pricing products, a professional cannot

project fixed overheads until and unless he is aware of the production quantum to be effected. The forecast of future production can only be made if a tentative selling price of the product is known because, in a competitive market, it is the selling price which decides the sale quantity and therefore the production volume. The authors contend that in case the selling price is known at the time of projecting fixed overheads then the re computation of the same is a valueless exercise.

2. *Traditional costing tools like standard costing induce a static behaviour in the employees.*

   During the past decade and a half, various writers such as Johnson and Kaplan, Ferrara and Monden etc have questioned the productivity and use of traditional systems such as standard costing and variance analysis. They argue that the use of standard costing renders employees static and curbs innovation and that companies following traditional standard costing find it difficult to improve upon standards because of severe resistance from employees who are convinced that the established best practise cannot be improved further.

3. *Fear of adverse variances forces managers to give undue importance to material price, labour rate and efficiency and capacity utilisation. These concepts are detrimental to the modern day world class manufacturing environment characterised by concepts of JIT and TQM.*

   In a World Class Manufacturing environment, characterised by Just in Time policies, the focus of the management is to produce only as much as is required. This requires purchase of small quantities of raw material, increase in the number of set ups and minimal importance to capacity utilisation. Policies like this result in increased adverse variances related to raw material prices, labour efficiency and production volume. Critics argue that the fear of such adverse variances affects goal congruence and forces managers to behave against their company's policies.

4. *Traditional costing does not provide the management with what is the allowable cost; rather it emphasises on the standard or actual costs.*

   This is looked upon as one of the major reasons for lack of innovation especially in the global era where competition amongst companies is unprecedented. It is argued that techniques like Target costing are much more motivating when compared to Traditional costing since the former encourage the use of concepts like value engineering and value analysis.

SELF-EXAMINATION QUESTIONS

1. Fill in the banks :

   (a) Compilation of direct material and labour standards entails setting up of —— and ————standards.

   (b) Time and motion study is used to set ..... standard.

   (c) Overhead expense standards are based on the budgeted.....

(d) A standard hour is a ..... hour meant for.....

(e) Standard costing is necessary for jobbing industry to.....a price and ..... a profitable job.

(f) Standard costing works on the principle of .....

(g) The problem of price fluctuations can be overcome to some extent by the use of ..... techniques.

(h) The suitable type of standard for control purposes is .....

2. State whether the following statements are *true or false:*

(a) The industrial engineering department is responsible for setting physical standards.

(b) Constant shortage of a material of specified quality in a factory may pose a problem in setting physical standards.

(c) If labour time standard is based on the maximum effciency, the unit cost will be higher.

(d) Setting of overhead expense standards involves the selection of a suitable level of output and budgeting of expense for that level of output.

(e) Where products of different sizes, shapes and quality are manufactured in a factory, standard hours is the proper basis of comparison of the output.

(f) Jobs differ from one another and hence it is not possible to use standard costing in jobbing industries.

(g) Inventory of finished goods for financial accounting purposes should be based on standard costs adjusted for price or expenditure variances.

(h) Standard costing does not help the manager in decision making. (i) Standard costs help price fixing when demand is elastic.

(j) Standard costs reflect optimum operations by bringing economic and technical factors together.

3. Explain briefly how standards are compiled for material and labour costs for a product

4. Fill in the blanks :

(a) Variance analysis involves the .....and .....of variances.

(b) Broadly variances may be of three types.....

(c) Selling and distribution expenses can be analysed under .....

(d) Cost ratios may be useful to control ..... overheads.

5. State whether the following statements are *true or false:*

   (a) Variances can be classified into controllable and uncontrollable.

   (b) All price variances are uncontrollable.

   (c) Operation cost method is not suitable for controlling administration overheads.

   (d) Work units can be established for measuring the output in relation to cost, to control selling and distribution costs.

6. In group A, the names of variances are given and in group B, examples of the reasons for cost variances are given. Match them.

Group A	**Group B**
A. Material Price Variance.	(1) A non-standard mixture used
B. Labour Rate Variance.	(2) Changes in basic price of raw materials.
C. Overhead Volume Variance.	(3) Poor working conditions.
D. Materials Usage Variance.	(4) Using skilled labour in place of unskilled labour.
E. Labour Efficiency Variance.	(5) Slackness in production

7. Explain briefly the nature and purpose of material and labour variances.

8. Fill in the blanks :

   (a) In a textile mill, different varieties of cotton are blended in different proportions. If the blend deviates from the standard blend, we get ..... variance.

   (b) The relation between the finished product and the raw material input is known as.....

   (c) If a skilled workman is used in place of an unskilled workman .....variance arises.

   (d) Volume variance arises because of ..... expenses.

9. Compute the material variances from the following data.

Actual quantity consumed	100 Kgs.
Actual price per kg.	Rs. 19
Standard price per kg.	Rs. 20

   Production in standard units is 45 units; one standard unit requires 2 kg. of material.

10. The standard time per unit is 2 hours at Re. 1/- per hour. During a period, 500 units are made and the records showed the actual payment of wages of Rs. 1,800 for 1200 hours worked. Compute the labour cost variances.

11. Given the following data compute the overhead expense variances.

		Fixed	*Variable*
Actual overheads per month		Rs.1,200	Rs.4,000
Budget for 10,000 hours		Rs.1,000	Rs.3,500
Standard hours produced	10,400		
Actual hours worked	10,000		

12. The income statement of XYZ Co. is presented below:

XYZ Company

Income statement

for the year ended Dec. 31, 1996

	Product AR-10		*Product ZR-7*		*Total*	
	Budget	*Actual*	*Budget*	*Actual*	*Budget*	*Actual*
Sales (units)	2,000	2,800	6,000	5,600	8,000	8,400
Total sales of market (units)	–	–	–	–	40,000	45,654
Sales revenue (Rs.)	6,000	7,560	12,000	11,760	18,000	19,320
Cost of goods sold (Rs.)	2,400	2,800	6,000	5,880	8,400	8,680
Fixed costs (Rs.)	1,800	1,900	2,400	2,400	4,200	4,300
Total costs (Rs.)	4,200	4,700	8,400	8,280	12,600	12,980
Net profit (Rs.)	1,800	2,860	3,600	3,480	5,400	6,340

Using the above information compute:

(a) Market size variance.

(b) Market share variance.

13. Fill in the blanks :

(a) The three plans of accounting for standards are .....

(b) In partial system work-in-progress account is credited at ..... cost.

(c) In single plan system work-in-progress account is charged at ..... cost.

(d) Under dual plan standards are used .....

14. State whether the following statements are *true or false.*

(a) In partial plan, the analysis is made at source.

(b) Dual plan helps to express the variances in the form of efficiency indices.

(c) Dual plan helps to convert standards into actuals by using the ratios.

(d) Single plan uses current standards.

15. The following are the two journal entries for the transaction noted below. State the plan to which these entries are applicable.

(a) Standard Clearing A/c Dr.

To Material Control A/c

For charging the actual quantity of material consumed at standard price.

(b) Material Control A/c Dr.

Dr. or Cr. Material Control Variance A/c

To Creditors

(For charging the standard cost of material to material control account there by transferring the price variance to price variance account.)

16. How are variances disposed off in a standard costing system? Explain.

17. "Calculation of variances in standard costing is not an end in itself, but a means to an end. "Discuss.

18. GLOBAL LTD. is engaged in marketing of wide range of consumer goods. A, B, C and D are the zonal sales officers for four zones. The company fixes annual sales target for them individually.

Your are furnised with the following :

(1) The standard costs of sales target in respect of A, B, C and D are Rs. 5,00,000, Rs. 3,75,000, Rs. 4,00,000 and Rs. 4,25,000 respectively.

(2) A, B, C and D respectively earned Rs. 29,900, Rs. 23,500, Rs. 24,500 and Rs. 25,800 as commission at 5% on actual sales effected by them during the previous your.

(3) The relevant variances as computed by a qualified cost accountant are as follows:

	A Rs.	B Rs.	C Rs.	D Rs.
Sales price variance	4,000 (F)	6,000 (A)	5,000 (A)	2,000 (A)
Sales volume variance	6,000 (A)	26,000 (F)	15,000 (F)	8,000 (F)
Sales margin mix variance	14,000 (A)	8,000 (F)	17,000 (F)	3,000 (A)

(A) = Adverse variance and (F) = Favourable variance

You are required to :

(i) Compute the amount of sales target fixed and the actual amount of contribution earned in case of each of the zonal sales officer.

(ii) Evaluate the overall performance of these zonal sales officers taking three relevant base factors and then recommend whose performance is the best.

ANSWERS TO SELF - EXAMINATION QUESTIONS

1. (a) quantity price (b) labour time (c) output (d) hypothetical, measuring output. (e) quote, choose (f) exception (g) forecasting (h) attainable level of good performance.
2. (a)True (b) True (c) False (d) True (e) True(f) False, (g) True, (h) False (i) True (j) True
4. (a) Calculation, interpretation (b) efficiency, price and volume (c) order processing, warehousing, sales promotion and distribution (d) administration.
5. (a) True (b) False (c) False (d) True
6. A,2 ; B,4 ; C, 5 ; D, 1 ; E, 3.
8. (a) mix (b) yield (c) substitution (d) fixed.
9. Usage variance Rs. 200 (A) Price variance Rs. 100 (F)
10. Efficiency variance Rs. 200 (A)
    Rate of pay variance Rs. 600 (A)
11. Types of variances

	Fixed	Variable
Efficiency variance	Rs. 40(F)	Capacity variance Nil
Expense variance	Rs. 200 (A)	Rs. 500 (A)

12. (a) Market size variance; Rs. 1,357 (Favourable)
    (b) Market share variance; Rs. 877 (Adverse)
13. (a) Partial, single and dual (b) actual (c) standard (d) bogey
14. (a) False (b) True (c) True (d) True.
15. (a) Dual (b) Single
18. (i) Actual margin

	A	B	C	D
Rs. '000	90	77	92	80

    (ii) The performance of the officer C is best.