Ans.2

Working Notes

(1) For actual (standard) output of 85 kgs. Std. Input is 100 kgs.

For actual output of 1,700 kgs. the Std. input = $\frac{100kgs \times 1700kgs}{85kgs}$ =2,000 kgs.

(2) 2,000 kgs of standard input for an actual output of 1,700 kgs. Contains the Materials A and B in the proportion of (40:60) i.e., 800 kgs. of A and 1,200 kgs. of Material B.

(3) Actual Material consumption for 1,700 kgs. of actual output (Kgs.)

Particulars	Materials	
	A	B
Stock on 1-9-2004	35	40
Add: Purchase during Sept. 2004	800	1,200
	835	1,240
Less: Stock on 30-09-2004	5	50
Material consumed during Sept.2004	830	1,190

(4) Calculation actual purchase price per kg. of material

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

Statement shoeing Standard and Actual Cost of Actual output

Material		Standard			Actual	
	Quantity Kg.	Rate Rs.	Amount Rs.	Quantity Kg.	Rate Rs.	Amount Rs.
A	800	4	3,200	35 } 830	4.00 }	140.00
				795	4.25	3,378.75
B	1,200	3	3,600	40 } 1190	3.00 }	120.00
				1150	2.50	2,875.00
	2,000			2,020		
Loss	300			320		
Output	1,700		6,800	1,700		6,513.75

Calculation of Material Variances

(a) Material price variance

Actual quantity (Std. price – Actual Price)

A = [35 (4 – 4)] + [795 (4 – 4.25)] =Rs.198.75 (A)

B = [40 (3 – 3)] +[1,150 (3 – 2.50)] =Rs. 575 (F) =Rs.376.25 (F)

(b) Material Usage variance

Std. rate (Std. quantity – Actual Quantity)

A = 4 (800 – 830) =Rs.120 (A)

B = 3 (1,200 – 1,190) =Rs. 30 (F) =Rs.90 (A)

(c) Material Yield Variance

Std. rate of output (Actual yield – Std. Yield)

=[Rs.$\frac{6,800}{1,700}$ x (1,700 kg. – 1,717 kg.)] =Rs.68 (A)

* Std. Yield = $\frac{\text{Actual std Output}}{\text{Std. Input}} \times \text{Actual input}$ $= \frac{85kgs}{100kgs} \times 2020kgs = 1717kgs$

(d) Material Mix Variance

Actual Quantity (Std. cost of Std. mix per kg. – Std. cost of actual mix per kg.)

$= 2020 \text{ kgs} \left(\frac{\text{Rs. } 6800}{2000 \text{ kgs}} - \frac{\text{Rs. } 6890^*}{2020 \text{ kgs}} \right)$ =Rs.22(A)

*[(830 kgs. x Rs.4)] + [(1,190 kgs x Rs.3)] =Rs.6,890

(e) Total Materials Cost Variance

Std. Cost – Actual Cost

=Rs.6,800 – Rs.6,513.75 =Rs.286.25 (F)

Summary of Material variance (Rs.)

Price variance		376.25 (F)
Usage variance		
1. Yield variance	68 (A)	
2. Mix variance	22 (A)	90 (A)
Total Material cost variance		286.25 (A)

Ans. 3: Take the good output of 182 kgs. The standard quantity of material required for 182 kg. of output is $\frac{182}{90} \times 100 = 202.22$

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

	Standard cost			*Actual cost*			*Revised std.quantity*
Component	Qty. Kg.	Rate Rs.	Amount Rs.	Qty. Kg.	Rate Rs.	Amount Rs.	Oty. Kg.
A (40% of 202.22 kg.)	80.89	60	4,853.40	90	18	1,620	80
B (60% of 202.22 kg.)	121.33	30	3,639.90	110	34	3,740	120
Total Input	202.22		8,493.30	200		5,360	200
(-) Loss	20.22			18			
Total output	182.00			182		5,360	—

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

Variances :

(i) **Price variance** =Actual qty. (Std. price – Actual price.)

A: 90 × (60-18) = 3780 (F)

B: 110 × (30-34) = 440 (A)

3340 (F)

(ii) **Total usage variance** = Std. price (Std. qty. – Actual qty.)

A: 60 × (80.89-90) = 546.60 (A)

B: 30 × (121.33-110) = 339.90 (A)

206.70 (A)

(iii) **Mix variance** = Std. price (Revised Std. quantity – Actual quantity)

A: 60 × (80-90) = 600 (A)

B: 30 × (120-110) = 300 (F)

300 (A)

(iv) **Yield variance** = Std. price of yield (Actual yield – Std. yield for actual mix)

$= \text{Rs. } \frac{8493.30}{182} \times (182 - \frac{182}{202.22} \times 200) = \text{Rs. } 93.30 \text{ (F)}$

(v) **Total variance** = Std. cost – Actual cost
= Rs. 8,493.30 – Rs. 5,360 = Rs. 3133.30 (F)

Note : (iii) and (iv) above are subparts of total usage variance
Proof : Price variance + Mix variance + Yield variance = Total variance
Rs. 3340 (F) + Rs.300 (A) + Rs. 93.30 (F) = Rs. 3133.30 (F)

Ans. 4: Working Notes :

(i) 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.

(ii) Statement showing computation of standard cost, standard cost of actual quantity and actual cost.

Material	*Std. cost per Kg.* *Rs.*	*Actual cost per Kg.* *Rs.*	*Std. qty in Kgs.*	*Actual qty in Kgs.*	*Std. cost (Std. qty × Std. price) Rs.*	*Std. cost of actual qty. (Actual qty. × Std. price) Rs.*	*Actual cost (Actual qty. × Actual price) 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

(iii) Standard cost per unit of the standard mix

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

(iv) Standard cost per unit of the actual mix $= \frac{Rs.8070}{4030 kgs} = Rs.2.002$

Variances:

(i) Price variance = Actual qty. (Std. price – Actual price)
= Rs.8,070 – Rs. 8,520 = Rs. 450 (A)

(ii) Mix variance = Total actual qty. (Std. cost per unit of std.mix – Std. cost per unit of actual mix)
= 4,030 Kgs. (Rs. 1.975 – Rs. 2.002) = Rs. 110 (A)

(iii) Sub usage variance = Std. price per unit of std. mix (Total std. qty – Total actual qty.)
= Rs. 1.975 (4,000 – 4,030) = Rs. 60.00 (A)

(iv) Total material cost variance = Std. cost – Actual cost
= Rs. 7,900 – Rs.8,520 = Rs. 620 (A)

Proof : Price variance + Mix variance + Sub-usage variance = Total variance
Rs. 450 (A) + Rs. 110 (A) + Rs. 60 (A) = Rs. 620 (A)

Note : *'Mix variance' and sub usage variance are sub-part of total usage variance which may*

be calculated as below:

Usage variance = Std. price (Std. qty. – Actual qty.)
= Standard cost – Standard cost of actual quantity
= Rs. 7,900 – Rs. 8,070 = Rs. 170 (A)

Ans.5

Basic data for calculation of Labour variances

Category of Workmen	Standard			Actual		
	Weeks	Rate Rs.	Amount Rs.	Weeks	Rate Rs.	Amount Rs.
Skilled	3,000	60	1,80,000	2,560	65	1,66,400
Semi – Skilled	1,200	36	43,200	1,600	40	64,000
Unskilled	1,800	24	43,200	2,240	20	44,800
Total	6,000		2,66,400	6,400		2,75,200

Calculation of Labour variances

(1) **Direct Labour Cost Variance**
Std. cost for actual output – Actual Cost
=2,75,200 – 2,66,400 =Rs.8,800 (A)

(2) **Direct Labour Rate Variance**
Actual time (Std. rate – Actual rate)

Skilled	= 2,560 (60 – 65)	=Rs.12,800 (A)	
Semi – Skilled	=1,600 (36 – 40)	=Rs. 6,400 (A)	
Unskilled	=2,240 (24 – 20)	=Rs. 8,960 (F)	=Rs.10,240(A)

(3) **Direct Labour Efficiency Variance**
Std. rate (Std. time for actual output – Actual time)

Skilled	=60(3,000 -2,560)	=Rs.26,400 (F)	
Semi – Skilled	=36 (1,200 -1,600)	=Rs.14,400 (A)	
Unskilled	=24 (1,800 – 2,240)	=Rs.10,560(A)	=Rs.1,440(F)

Direct Material efficiency Variance can be further analysed into:

(a) **Direct Labour Mix Variance**
Std. rate (Revised Std. time – Actual time)

Skilled	=60(3,200 -2,560)	=Rs.38,400 (F)	
Semi – Skilled	=36 (1,280 -1,600)	=Rs.11,520 (A)	
Unskilled	=24 (1,920 – 2,240)	=Rs. 7,680 (A)	=Rs.19,200 (F)

* Revised Std. time

Skilled $=\frac{6,400}{6,000} \times 3,000$ =3,200

Semi- skilled $=\frac{6,400}{6,000} \times 1,200$ =1,280

Unskilled $=\frac{6,400}{6,000} \times 1,800$ =1,920

(b) **Direct Labour Revised Efficiency variance**
Std. rate (Std. time for actual output –Revised Std. time)
Skilled =60(3,000 -3,200) =Rs.12,000 (A)

Semi – Skilled	=36 (1,200 -1,280)	=Rs. 2,880 (A)	
Unskilled	=24 (1,800 – 1,920)	=Rs. 2,880 (A)	=Rs.17,760(A)

Summary of Labour variances

		(Rs.)
Rate variance		10,240 (A)
Efficiency variance		
(a) Mix variance	19,200 (F)	
(b) Revised efficiency variance	17,760 (A)	1,440 (F)
Direct Material cost variance		8,800 (A)

Ans. 6: *In a 40 hour week, the standard gang should have produced 1,000 std. hours as shown below:*

Gang:-

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*			*Standard cost of Actual time*		
	Hours	Rate Rs.	Amount Rs.	Hours	Rate Rs.	Amount Rs.	Hours	Rate Rs	Amount Rs.
Skilled									
$\left\{\frac{600}{1000}\times 900\right\}$	576	3	1,728	14×40 = 560	4	2,240	560	3	1,680
Semi-skilled									
$\left\{\frac{240}{1000}\times 900\right\}$	216	2	432	9 × 40 = 360	3	1,080	360	2	720
Unskilled									
$\left\{\frac{120}{1000}\times 900\right\}$	108	1	108	2 × 40 = 80	2	160	80	1	80
	900	2.52	2,268	1,000	3.48	3,480	1,000	2.48	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) Total labour cost variance = Std. labour cost – Actual labour cost
= Rs. 2,268 – Rs. 3,480 = Rs. 1,212 (A)

The gang composition variance may also be known as labour mix variance and is part of efficiency variance which may be computed as under:

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

Ans. 7: Standard cost charged to production Rs. 5,000
(1,000 units× 2.5 hours × Rs.2)
Actual wages paid Rs. 4,500
Actual wage rate per hour (Rs. 4500÷2000) Rs. 2.25
Std. wage rate per hour Rs. 2.00
Abnormal idle time *(25% of 2,000 hours)* 500 hrs.

Variances :

(i) Wage 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 (A)

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

**Actual time less idle time.*

Ans.8

Basic data for Standard and actual labour cost of producing 1,000 articles of 'A' and standard cost of actual labour hours

	Standard Cost			**Actual Cost**			
Labour	Hours	Rate Rs.	Amount Rs.	Hours	Rate Rs.	Amount Rs.	Std. cost of actual labour hours (Actual hours x Std. rate)Rs
Skilled	10,000	3.00	30,000	9,000	4.00	36,000	27,000
Semi – Skilled	8,000	1.50	12,000	8,400	1.50	12,600	12,600
Unskilled	16,000	1.00	16,000	20,000	0.90	18,000	20,000
Total	34,000		58,000	37,400		66,600	59,600

Calculation of Labour variances

(1) **Labour Cost Variance**
Std. cost – Actual Cost
=Rs.58,000 – Rs.66,600 =Rs.8,600 (A)

(2) **Labour Rate Variance**
Actual Hours (Standard rate – Actual rate)
OR

Std. cost of actual hours – Actual Cost
=Rs.59,600 – Rs.66,600 =Rs.7,000 (A)

(3) **Labour Efficiency Variance**

Std. rate of Std. mix (Total Std. hours for actual output – Total Actual hours)

$$=\frac{\text{Rs. } 58000}{34000}(34000-37400) \qquad =\text{Rs.}5{,}800(\text{A})$$

(4) **Labour Mix Variance**

Total actual hours (Std. rate of standard mix – Std. rate of actual mix)

$$=34000\left(\frac{58000}{34000}-\frac{59600}{37400}\right) \qquad =\text{Rs.}4{,}200(\text{F})$$

Summary of Labour variances	(Rs.)
Rate variance	7,000 (A)
Efficiency variance	5,800 (A)
Mix variance	4,200 (F)
Labour Cost variance	8,600 (A)

Ans. 9: (i) Variable overhead variance:

= (Standard variable overhead – Actual variable overhead)

= (Rs. 2,40,000 – Rs. 2,00,000) = Rs. 40,000 (Favourable)

(Refer to Working note 1)

(ii) Variable overhead budget variance:

= (Budgeted variable overhead for actual hours – Actual variable overhead)

= Rs. 2,24,000 – Rs. 2,00,000 = Rs. 24,000 (Favourable)

(Refer to Working note 2)

(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)

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

Ans. 10: Actual output = 9,000 units

Idle time = 5,000 hours

Production time (Actual) = 1,05,000 hours

Standard hours for actual production = 10 hours / unit × 9,000 units = 90,000 hours.

Labour efficiency variance = 3,75,000 (A)

i.e. Standard rate × (Standard Production time – Actual production time) = 3,75,000(A).

SR (90,000 – 1,05,000) = – 3,75,000

$$\text{SR} = \frac{-3{,}75{,}000}{} = \text{Rs. } 25$$

– 15,000

(i) Idle time variance = 5,000 hours × 25 Rs. / hour = 1,25,000. (A)

(ii) Standard Variable Overhead = Rs. 150 / unit

Standard hours = 10 hours / unit

Standard Variable Overhead rate / hour = 150 / 10 = Rs. 15 / hour

Total Variable Overhead variance = Standard Variable Overhead – Actual Variable Overhead
= Standard Rate × Standard hours – Actual rate × Actual hours
= (15) × (10 × 9,000) – 16,00,000
= 13,50,000 – 16,00,000

Total Variable Overhead Variance = 2,50,000 (A)

(iii) Variable Overhead Expenditure Variance =(Standard Rate × Actual Hours) – (Actual Rate × Actual Hours)
= (15 × 1,05,000) – 16,00,000
= 15,75,000 – 16,00,000
= 25,000 (A)

(iv) Variable Overhead Efficiency Variance = Standard Rate × (Standard Hours for actual output – Actual hours for Actual output)
= 15 (90,000 – 1,05,000)
= 15 (–15,000)
= 2,25,000 (A)

(b) Alternative Solution

Actual Output = 9,000 Units

Idle time = 5,000 hrs

Direct Wages Paid = 1,10,000 hours @ Rs. 22 out of which 5,000 hours being idle, were not recorded in production.

Standard hours = 10 per unit.

Labour efficiency variance = Rs. 3,75,000 (A)

or

Standard Rate (Standard Time – Actual Time) = – 3,75,000

Or Standard Rate = Rs 25/-

(i) Idle time variance = Standard Rate × Idle time

25 × 5,000 = Rs 1,25,000 (A)

(ii) Standard Variable Overhead / unit = 150

Standard Rate = $\frac{150}{10}$ = Rs.15/hour

Standard Quantity = 10 hours

Actual Variable Overhead = 16,00,000

Standard Variable Overhead = 150 × 9,000 = 13,50,000

Actual Variable Overhead = 16,00,000

Total Variable Overhead Variance = 2,50,000 (A)

(iii) Variable Overhead expenditure = Standard Variable Overhead for actual hours – Actual Variable Overhead
= (150 × 1,05,000) – 16,00,000

= 15,75,000 – 16,00,000

= 25,000 (A)

(iv) Variable overhead efficiency variance = Standard Variable Overhead for actual output – Standard Variable Overhead for Actual hours)

= 15 (10 hours × 90,000 units – 1,05,000)

= 15 (90,000 – 1,05,000)

= 15 (–15,000)

= 2,25,000 (A)

Ans.11: Computation of standard cost and actual cost

Standard Cost			
Direct Materials	(6,000 x Rs.12)		72,000
Direct Labour	(6,000 x Rs.4.40)		26,400
Variable Overheads	(6,000 x Rs.3)		18,000
Total standard Costs		(a)	1,16,400
Actual Costs			
Direct Materials	(12,670meters x Rs.5.70)		72,219
Direct Wages			27,950
Variable Overheads			20,475
Total Actual Costs		(b)	1,20,644
Total Variance		(a)-(b)	4,244,(A)

Computation of Missing figures

(1) Actual Labour hours

Standard variable overhead rate hour (Standard hours – Actual hours) = Rs.1,500 (A)

Rs.1,500 A =Rs.3 (6,000 x 1 hour – Actual hours)

Rs.1,500 A =Rs.18,000 –(Rs.3 x actual hours)

(Rs.3 x Actual hours) =Rs.18,000 + Rs.1,500

Actual hours =Rs.19,500 / 3 = 6,500 hours

(2) Actual Wage rate hour = $\frac{\text{Actual wages paid}}{\text{Total Actual hours}}$ $\frac{\text{=Rs.27,950}}{\text{6,500 hours}}$ =Rs.4.3

Computation of Material Labour and Variable Overhead Variances

1. Material variances

(1) Material Cost Variance
Standard Cost- Actual Cost
=(Rs.72,000 – Rs.72,219) =Rs.219 (A)

(2) Material Price Variance
Actual Quantity of Material consumed (Std, price- Actual Price)
=12,670 meters (Rs.6- Rs.5.70) =Rs.3,801 (F)

(3) Material Usage Variance
Standard price (Standard Quantity –Actual Quantity)
=Rs.6 (12,000 metres -12,670 metres) =Rs.4,020 (A)

2. Labour Variances

(1) Labour Cost Variance
Standard Cost- Actual Cost
=(Rs.26,400 – Rs.27,950) =Rs.1,550 (A)

(3) Labour Rate Variance
Actual hours (Std. wage rate per hour- Actual wage rate per hour)
=6,500 hours (Rs.4.40- Rs.4.30) =Rs.650 (F)

(3) Labour Efficiency Variance
Standard rate per hour (Standard hours –Actual hours)
=Rs.4.40 (6,000 hours- 6,500 hours) =Rs.2,200 (A)

3. Variable Overhead Variances

(1) Total Variable overhead Variance
Standard Variable Overhead- Actual Variable Overhead
=Rs.18,000 – Rs.20,475 =Rs.2,475 (A)

(4) Variable overhead Efficiency Variance
Standard Variable overhead rate per hour (Std. hours for actual output-Actual hours)
=Rs.3 (6,000 – 6,500) =Rs.1,500 (A)

(3) Variable overhead Budget Variance
Budgeted variable overhead –Actual variable overhead)
=(Actual hours worked x Std. variable overhead per hour) – Actual variable overhead
=(6,500 x Rs.3) – Rs.20,475 =Rs.975 (A)

Note: (F) denoted Favourable Variance; (A) denoted Adverse Variance

Ans 12:

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.*

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

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

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

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*

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

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. 1,62	Rs. 11,620
Actual direct labour cost		Rs. 9,450

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

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

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

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*

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

:

(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)*
= Rs. 2000 (Favourable)

Alternatively,
= 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)

Ans. 13: Budgeted daily hours per day of June = $\frac{12000hrs}{24days} = 500hrs/day$

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

Calendar Variance = *Std. fixed overhead rate per hr*
(No. of hrs. in actualperiod– 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.

Ans. 14: 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)

Ans. 15: (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. fixed overhead rate of absorption per unit = $\frac{Rs.10000}{5000units} = Rs.2$

Std. fixed overhead rate of absorption per hour: $\frac{Rs.10000}{5000units \times 4hrs.} = \text{Re}.0.50$

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

Ans. 16:

Working Notes:

1) **Budgeted output in units**
40,000 man hours X 3.2 units per man hours = 1,28,000 units.

2) **Standards variable overhead rate per unit**
Rs, 1,02,400/1,28,000 units = Rs. 0.80 per unit

3) **Standard variable overhead rate per man hour**
Rs. 1,02,400/40,000 man hours = Rs. 2.56 per man hour

4) **Standard fixed overhead rate per unit**
Rs 32,000/1,28,000 units = Rs. 0.25 per unit

5) **Actual Production units**
43,000 man hours X 3 units per man hour = 1,29,000 units

Computation of variable Overhead variances:

i) **Total Variable Overhead Variances**
= Variable overhead recovered on actual output – Actual variable overhead
= (1,29,000 units X 0.80 P – Rs. 1,14,000) = Rs. 11,200 (A)

ii) Variable Overhead Expenditure Variance
= Budgeted variable overhead for actual hours – Actual Variable overhead
= (43,000 X 2.56 – Rs. 1,14,400) = Rs. 4,320 (A)

iii) Variable Overhead Efficiency Variance
= Standard variable overhead rate per hour (Standard hours for actual output- Actual hours)
= Rs. 2.56 (40,312.5 hours – 43,000 Hours) = Rs. 6,880 (A)

Computation on Fixed Overhead Variances:

i) Total Fixed Overhead Cost Variance
= Fixed overhead recovered on actual output – Actual fixed overhead
= (1,29,000 units – 0.25 P – Rs. 31,500) = Rs. 750 (F)

ii) Fixed Overhead Expenditure Variance
= Budgeted fixed overhead – Actual fixed overhead
= (Rs. 32,000 – Rs. 31,500) = Rs. 500 (F)

iii) Fixed Overhead Volume Variance
= Standard fixed overhead per unit (Actual output units – Budgeted output units)
= 0.25 P (1,29,000 – 1,28,000) = Rs. 250 (F)

iv) Fixed Overhead Efficiency Variance
= Standard fixed overhead rate per unit (Actual Quantity – Standard Quantity)
= 0.25 P (43,000 hours X 3.2 units – 1,29,000 units) = Rs. 2,150 (A)

v) Fixed Overhead Capacity Variance
= Standard fixed overhead rate per hour (Actual capacity hours – Budgeted capacity hours in actual days)
= (Rs. 32,000/40,000 hours) (43,000 – 21 days X 2,000 hours) = Rs. 800 (F)

vi) Calendar Variance
= (Budgeted Days – Actual Days) Standard fixed overhead per day
= (20 days – 21 days) (Rs. 32,000/20 days) = Rs. 1,600 (F)

Computation of Total Overhead Variances
= Total variable overhead variances + Total fixed overhead variances
= Rs. 11,200 (A) + Rs. 750 (F) = Rs. 10,450

Ans. 17: 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)

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

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

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)

Ans. 18:

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

B. **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

$$=15600units\left(\frac{Rs.2445000}{15600}-\frac{Rs.2380000}{15000}\right)$$

=Rs. 2475200 – Rs. 2380000 = Rs. 95200F

= 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 Rs.	*Cost* Rs.	*Margin* Rs.
Bravo	100	90	10

Champion	200	170	30
Super	180	130	50

(2) *Actual margin per unit*

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

(3) *Budgeted profit*

	Units Rs.	*Margin* Rs.	*Total profit* 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 Rs.	*Margin* Rs.	*Total profit* 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

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

= 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)

Ans. 19: Working Notes:

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

Product different PC models	*Budgeted contribution margin per unit of each product*	*Budgeted sales volume*	*Total budgeted contribution margin*
	(Rs.)	*(Units)*	*(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
		10,000	15,60,00,000

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

= Rs.15,600

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

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

= 16

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

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

Actual sales mix %age of product Portable PC $= \frac{1,650 \text{ units}}{11,000 \text{ units}} \times 100 = 15$

Actual sales mix %age 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

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

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.2,60,00,000 (Adv.)

Total Sales Volume Variance = Rs.1,96,00,000 (Adv.)

(ii) Computation of total sales quantity variance:

$$\text{Total sales quantity variance} = \begin{bmatrix} \text{Total actual sales Unit} - \text{Total Budgeted Sales units} \end{bmatrix} \times \begin{matrix} \text{Budgeted average contribution margin per unit} \end{matrix}$$

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

(iii) Computation of the market size and market share variance

1. Market size variance:

$$\text{Budgeted market Share \%age} = \begin{bmatrix} \text{Actual Industry Sales in units} - \text{Budgeted Industry Sales in units} \end{bmatrix} \times \begin{matrix} \text{Budgeted average contribution margin per unit} \end{matrix}$$

= 0.20 (68,750 units – 50,000 units) × Rs.15,600 = Rs.5,85,00,000 (Fav.)

2. Market share variance:

$$= \begin{bmatrix} \text{Actual market share percentage} - \text{Budgeted market share percentage} \end{bmatrix} \begin{bmatrix} \text{Actual Total Sales Volume in units} \end{bmatrix} \times \begin{bmatrix} \text{Budgeted average Contribution margin per unit} \end{bmatrix}$$

= (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 and total sales mix variance:

Sales mix variance:

$$\begin{bmatrix} \text{Actual sales mix \%age of product} - \text{Budgeted sales mix \%age of product} \end{bmatrix} \times \begin{bmatrix} \text{Actual Total Sales Volume in units} \end{bmatrix} \times \begin{bmatrix} \text{Budgeted Individual Contribution margin} - \text{Budgeted average contribution margin} \end{bmatrix}$$

PC*** = (0.75 – 0.70) × 11,000 units × (Rs.10,000 – Rs.15,600)

= Rs.30,80,000 (Adv.)

Super PC****= (0.10 – 0.20) × 11,000 units × (Rs.40,000 – Rs.15,600)

= Rs.2,68,40,000 (Adv.)

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

* Refer to working note 1.

**Refer to working note 2.

***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.

Ans 20: Working Notes

1. Material data

Standard data for actual output			Actual output 6,400 units Actual data for actual output		
Quantity Kgs.	Price Per Kg.	Amount Rs.	Quantity Kgs.	Price Per Kg.	Amount Rs.
32,000	8	2,56,000	36,000	7.50	2,70,000

2. Labour data

Standard data for actual output			Actual output 6,400 units Actual data for actual output		
Labour hours	Rate/hour Rs.	Amount Rs.	Labour hours	Rate/hour Rs.	Amount Rs.
32,000	8	2,56,000	36,000	7.50	2,70,000

3. Variable overheads data

Standard/Budgeted data		Actual data	
Budgeted variable overheads for actual hours	6,50,000	Actual variable overheads (Rs.)	6,48,000
		Actual Units	6,400
		Actual Hours	65,000
Standard variable overhead Rate/hour	Rs. 10		
Standard variable overhead rate/ unit	Rs. 100		

4. Sales data

	Budgeted data			Actual data	
Sales Units	Budgeted Margin p.u. Rs.	Amount Rs.	Sales Units	Actual Margin p.u. Rs.	Amount Rs.
6,000	50	3,00,000	6,400	65	4,16,000

	(Rs. 250 – Rs. 200)			(Rs. 265 – Rs. 200)	

1. Market Size Variance
= Budgeted market share percentage [Actual industry sales in units – Budgeted industry sales in units]
Budgeted contribution margin per unit

= 0.12 [60,000 units – 6,000 units/12%] Rs. 50
= 0.12 [60,000 units – 50,000 units] Rs. 50 = Rs. 60,000 (F)

2. Market Share Variance
= [

=[0.106666 – 0.12] 60,000 units X 50
= (6,400 units – 7,200 units) Rs. 50 = Rs. 40,000 (A)

3. Gross Margin Sales Volume Variance
= (Actual quantity – Budgeted quantity) Budgeted margin per unit
= (6,400 units – 6,000 units) Rs. 50 = Rs. 20,000 (F)

4. Gross Margin Sales Price Variance
= (Actual margin per unit – Budgeted margin per unit) Actual quantity of units sold
= [(Rs. 65 – Rs. 50) 6,400] 6,400 units = Rs. 96,000 (F)

5. Direct Material Usage Variance
= (Standard quantity – Actual Quantity) Standard Price per kg.
= (32,000 kgs – 36,000 kgs.) Rs. 8 = Rs. 32,000 (A)

Direct Material Price Variance
= (Standard price/kg. – Actual price/kg.) Actual quantity of material used
= (Rs. 8 – Rs. 7.50) 3,600 kgs. = Rs. 18,000 (F)

6. Direct Labour Efficiency Variance
= (Standard labour hours – Actual labour hours) Standard rate per hour
= (64,000 hours – 65,000 hours) Rs. 6 = Rs. 6,000 (A)

Direct Labour Rate Variance
= (Standard labour rate per hour – Actual labour rate per hour) Actual time taken in hours
= (Rs. 6 – Rs. 6.40) 65,000 hours = Rs. 26,000 (A)

7. Variable Overhead Efficiency Variance
= (Standard hours for actual output – Actual Hours) Standard variable overhead per hour
= (64,000 hours – 65,000 hours) Rs. 10 = Rs. 10,000 (A)

Variable Overhead Expense Variance
= Budgeted Variable Overhead – Actual Variable Overhead
= Rs. 6,50,000 – Rs. 6,48,000 = Rs. 2,000 (F)

Operating Statement
(Reconciling the budgeted contribution with actual contribution

	Rs.	Rs.	Rs.
Budgeted Contribution			3,00,000
Gross margin sales volume variance	20,000	-	
Gross margin sales price variance	96,000	-	1,16,000
			4,16,000
Cost Variances			
Material usage	-	32,000	
Material price	18,000	-	
Labour efficiency	-	6,000	

Labour rate	-	26,000	
Variable overhead efficiency	-	10,000	
Variable overhead expense	2,000	-	
	20,000	74,000	54,000
Total Actual Contribution			3,62,000

Verification:
Actual Contribution
= Actual sales revenue – Actual variable costs
= Rs. 16,96,000 – [RS. 2,70,000 (actual material cost) + Rs. 4,16,000 (actual labour cost) + Rs. 6,48,000 (actual variable overheads)]
= Rs. 16,96,000 – Rs. 13,34,000 = Rs. 3,62,000

Ans.21:Working

(i) Normal / Budgeted hours =60,000 Direct Labour hours.
(ii) Budgeted output =60,000/ 12 =5,000 units
(iii) Budgeted fixed overhead rate =9,00,000 / 60,000
=Rs.15 per hour or 9,00,000 / 5,000 =Rs.180 per unit

(iv) standard cost and profit per unit (Rs.)

Direct materials	(20kg X 10)	200
Direct labour	(12 hrs. X 5.50)	66
Variable overheads	(12 hrs. X 10)	120
Fixed Overheads	(12 hrs. X 15)	180
Total		566
Selling price		600
Standard profit		34

(v) Actual profit (Rs.)

Sales		28,32,000
Less: cost of sales;		
Direct Material	10,50,000	
Direct wages	3,10,000	
Overheads	15,26,000	28,86,000
Actual profit		(54,000)

Direct Material variances

DMCV = Standard Cost for actual output – Actual cost
=(4,800 X 200)-10,50,000 =9,60,000-10,50,000 =Rs.90,000 (A)
DMPV = Actual qty. X (standard rate – Actual rate)
=1,00,000 X (10-10.5) =Rs.50,000 (A)
DMUV = Std. rate X (std. qty. for actual output- actual qty.)
=10 x (4,800 X 20)-1,00,000) =10 X (96,000-1,00,000) =Rs.40,000 (A)

Direct Labour variances

DLCV = Standard Cost of actual output – Actual cost
=(4,800 X 12 X 5.50)-3,10,000 =3,16,800-3,10,000 =Rs.6,800 (F)
DLRV = Actual Time X (Standard rate – Actual rate)
=62,000 X (5.50-5) =Rs.31,000 (F)
DLEV = Std. Rate X (Std. Time. for actual output- actual Time)
=5.50 x (4,800 X 12)-62,000) =5.50 x (57,600-62,000) =Rs.24,200 (A)

Overhead variances

VOCV = Recovered variable Overheads – Actual variable Overheads
=(4,800 X 120) – 5,86,000 = 5,76,000 – 5,86,000 =Rs.10,000 (A)
FOCV = Recovered fixed overheads – Actual fixed overheads
=(4,800 X 180) – 9,40,000 =8,64,000 – 9,40,000 =Rs.76,000 (A)

FOEXPV = Budgeted fixed overheads – Actual fixed overheads
=9,00,000 – 9,40,000 =Rs.40,000 (A)
FOVV = Recovered fixed overheads – Budgeted fixed overheads
=8,64,000 – 9,00,000 =Rs.36,000 (A)
FOCAPV = Std. rate per hour (Actual time – budgeted time)
=15 X (62,000 – 60,000) =Rs.30,000 (F)
FOEFEV =Std. Rate per hour X (Std. time for actual output – Actual time)
=15 X (4,800 X 12) – 62,0000 =15 X (57,600 – 62,0000=15 X 4400 =Rs.66,000(A)

Sales Variances
Sales Value = Budgeted Sales – Actual Sales
Variance =(5,000 X 600) -28,32,000 = Rs.30,00,000 – Rs.28,32,000 =1,68,000(A)
Sales Price = Actual qty. (Std. Price – Actual price)
Variance = 4,800 X (600 – 590) =Rs.48,000 (A)
Sales Volume = Std. Price X (Budgeted qty. – Actual qty.)
Variance =600 X (5,000 – 4,800) =Rs.1,20,000(A)
Loss of profit due to loss of sales volume = 200 X 34 =Rs.6,800 (A)

Ans. 22: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 : $\frac{\text{Rs. } 37{,}500}{5{,}000 \text{ units}}$ = 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

(1) 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.	Rs.
Budgeted profit		37,500
Less: Sales margin volume variance (Adverse)*		

or loss of profit on sales volume variance

= Rs. 9000 × $16\frac{2}{3}$% **		1500
Standard profit		36,000
*Sales margin volume variance (Adverse)		
(200 units × Rs.7.50 = Rs.1,500)		
**Profit as % of selling price : Rs. 7.50 × %		
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

Ans. 23: Details of original and revised standards and actual achieved

	Original standards		Revised standards		Actual	
Fruit	400 Kgs × Rs16	Rs6,400	400 Kgs × Rs 19	Rs7,600	428 Kgs × Rs 18	Rs7,704
Glucose	700 Kgs × Rs10	Rs7,000	700 Kgs × Rs12	Rs 8,400	742 Kgs × Rs 12	Rs 8,904
Pectin	99 Kgs × Rs 33.2	Rs 3286.8	99 Kgs × Rs 33.2	Rs 3286.8	125Kgs × Rs 32.8	Rs 4,100
Citric acid	1 Kg × Rs 200	Rs 200	1 Kg × Rs 200	Rs 200	1 Kg × Rs 95	Rs 95
	1,200 kgs	Rs16,886.8	1,200 kgs	Rs19,486.8	1,296 kgs	Rs20,803
Labour		Rs 585.0		Rs 585.0		Rs 600
	1,200 kgs	17,471.8	1,200 kgs	20,071.8	1,296 kgs	21,403
Loss	36 kgs		36kgs		132	
	1,164kgs	Rs 17,471.8	1,164kgs	Rs 20,071.8	1,164 Kgs	Rs 21,403

(i) Planning variances

* Fruit extract (6,400 less 7,600)	Rs 1,200(Adverse)
Glucose syrup (7,000 less 8,400)	Rs1,400(Adverse)
Total	Rs 2,600(Adverse)

* (Std qty × Std price less Std qty × Revised Std price)

(ii) Ingredients operating variances

Total (19,486.8 less 20,803) = Rs 1,316.2(Adverse)

Ingredients Price variance

(Revised Material Price – Actual Material Price)×(Actual Qty Consumed)

		Variance in Rs
Fruit extract	(19 – 18) × 428	428(F)
Glucose syrup		Nil
Pectin	(33.2 – 32.8) × 125	50(F)
Citric acid	(200 – 95) × 1	105(F)
		583(F)

Usage variance

(Std Qty on Actual Production less Actual Qty on Actual Production) × Revised Std Price/Unit

	Rs	*Variance in Rs*
Fruit extract	(400 – 428) × 19	532(A)
Glucose syrup	(700 – 742) ×12	504(A)
Pectin	(99 – 125) ×33.2	863.2(A)
Citric acid		Nil
		1,899.2(A)

(iii) Mix Variance

(Actual usage in std mix less Actual usage in actual mix) ×std price

		Variance in Rs
Fruit extract	(432 – 428) ×19	76(F)
Glucose syrup	(756 – 742) × 12	168 (F)
Pectin	(106.92 – 125) ×33.2	600.3(A)
Citric acid	(1.08 – 1) ×200	16(F)
		340.3 (A)

Yield variance

(Actual yield – Std yield from actual output) × Std cost per unit of output

$$= (1{,}164 - 1{,}296 \times 0.97) \times \frac{19486.8}{1164} = 1{,}558.9(A)$$

Labour operating variance

585 – 600 = 15(A)

(iv) Total variance = Planning variance + Usage Variance + Price Variance + labour operating Variance.

Or Total Variance = (2,600) + (1,899.2) + 583 + (15) = 3931.2 (A).

<u>Ans.25:</u> Standard hours produced

	Product X	*Product Y*	*Total*
Out put (units)	1,200	800	
Hours per unit	8	12	
Standard hours	9,600	9,600	19,200

Actual hours worked

100 workers $\times$8 hours $\times$ 22 days = 17,600

Budgeted hours per month

1,86,000/12 = 15,500

Capacity Ratio = $\frac{\text{actual hours}}{\text{Budgeted hours}} \times 100 = \frac{17,600}{15,500}$ = 113.55 %

Efficiency Ratio = $\frac{\text{Standard Hours Produced}}{\text{Actual hours}} \times 100 = \frac{19,200}{17,600} \times 100$ 109.09%

Activity Ratio = $\frac{\text{Standard Hours Produced}}{\text{Budget hours}} \times 100 = \frac{19,200}{15,500} \times 100$ 123.87%

Relationship : Activity Ratio = Efficiency Ratio $\times$ Capacity Ratio

or $123.87 = \frac{109.09 \times 113.55}{100}$

<u>Ans: 26:</u> (1) Capacity Ratio

$= \frac{\text{Actual working Hours}}{\text{Budgeted working hours}} \times 100$

$= \frac{\text{25 days x 8 hours x 50 workers}}{\text{8,500 hours (i.e.,1,02,000/12)}} \times 100$ =117.65%

(2) **Activity Ratio**

$= \frac{\text{Actual production in standard hours}}{\text{Budgeted hours}} \times 100$

$= \frac{\text{(1,000 units x 5 hours) + (600 units x 10 hours)}}{\text{8,5000 hours}} \times 100$ =129.41%

(3) Efficiency Ratio

$= \frac{\text{Standard hours for actual production}}{\text{Actual hours}} \times 100$

$= \frac{\text{(1,000 units x 5 hours) + (600 units x 10 hours)}}{\text{10,000 hours}} \times 100$ =110%

Inter – relationship

Capacity Ratio x Efficiency Ratio =Activity Ratio

117.65% x 110% =129.41%

<u>Ans. 27:</u>

Maximum capacity in a budget period

= 50 employees $\times$ 8 hrs.$\times$5 days$\times$4 weeks

= 8,000 hrs.

Budgeted hours
40 employees ×8 hrs.×5 days×4 weeks
= 6,400 hrs.

Actual hrs. = 6,000 hrs. (from the sum) Standard hrs.
for actual output = 7,000 hrs.

Budget no. of days = 20 days = 20 days (4 weeks ´5 days) Actual no.
of days = 20-1 = 19 days

1. Efficiency ratio = $\frac{\text{Standard Hrs}}{\text{Actual Hrs}} \times 100 = \{(7000 \div 6000) \times 100\} = 116.67\%$

2. Activity ratio = {(7,000÷6,400)×100} = 109.375%
3. Calendar Ratio = (Available working days ÷ budgeted working days) × 100
   = {(19÷20)×100} = 95%
4. Standard Capacity Usage Ratio =
   (Budgeted hours ÷ Max. possible hours in the budgeted period) × 100
   = {(6,400÷8,000)×100} = 80%
5. Actual Capacity Usage Ratio =
   (Actual hours worked ÷ Maximum possible working hours in a period) × 100
   = {(6,000÷8,000)×100} = 75%
6. Actual Usage of Budgeted Capacity Ratio = (Actual working
   hours ÷ Budgeted hours) × 100
   = {(6,000÷6,400)×100} = 93.75%

Ans.28:

(i) Dr. Material Control A/c
Dr. or Cr. Material Price Variance A/c
Cr. Creditors A/c
(Being price variance during purchase of materials)

(ii) Dr. WIP Control A/c
Dr. or Cr. Material Usage Variance A/c
Cr. Material Control A/c
(Being recording of usage variance at Standard cost of excess/under utilized quantity)

(iii) Dr. Wages Control A/c
Dr. or Cr. Labour Rate Variance A/c
Cr. Cash
(Being entry to record wages at standard rate)

Ans. 29:(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			6,862.5

(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 variance 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

Ans. 30:(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:

		Dept. A Rs.	*Dept. B* Rs.	*Total* Rs.
(a)	Charged to production:			
	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:

Material Control A/c

Dr.	Rs.		Cr. 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

Wages Control A/c

Dr.	Rs.		Cr. 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

Work-in-Progress (Dept. A) Control A/c

Dr.	Rs.		Cr. 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

Work-in-Progress (Dept. B) Control A/c

Dr.	Rs.		Cr. 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

Overhead Expense Control (Dept. A) A/c

	Dr.	Rs.	Cr. 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

Material Price Variance A/c

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

Material Usage Variance A/c

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

Labour Efficiency Variance A/c

Dr.	Rs.		Cr. 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

Overhead Efficiency Variance A/c

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

Overhead Capacity Variance A/c

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

Overhead Expenses Variance A/c

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

Creditors A/c

Dr.	Rs.		Cr. 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

Ans.31:All figures of Ans. 31are 5 times of Ans. 32

Ans. 32: Material – 1 Rate Variance = Standard cost of material purchased – Actual cost

= Rs24, 000 – Rs21, 600 = Rs2, 400 (F)

Material – 2 Quantity Variance = SR × SQ – SR × AQ

= Rs900 × 80 units – Rs75, 600

= Rs3, 600 (A)

Labour Spending Variance = SR × AH – AR × AH

= Rs24/per hour × 2300 hours – Rs51, 750

= Rs3, 450 (A)

Labour Efficiency Variance = SR × (SH – AH)

– 7200 = 24 (SH – 2300)

SH = 2000 Hrs.

	Rs
Total Cost of material purchased	1,27,200
Less Purchase Value of Material – 2	1,05,600
Cost of material –1	21,600

Working Notes:

(1) Standard Cost of Material – 2 actually consumed in production = Rs72, 000 (Given)

Standard cost of Material – 2 per unit: 5 litres × Rs180	= Rs900
∴No of units produced	= Rs72, 000 / Rs900 = 80 units
Total material – 1 used in production	= Rs18, 000 (Given)
Add Closing Inventory	= Rs6, 000 (Given)
Less Opening Inventory	= 0
Hence Standard Cost of Material – 1 purchased	= Rs24, 000

(2)	Standard Rate of Material -1	= Rs24, 000 / 1,000kg = Rs24 per kg
	Standard Cost of Material – 1	= Rs18, 000
	Add favourable Quantity Variance	= Rs1, 200
	Material – 1 allowed	= Rs19, 200
	Standard quantity of Material – 1 allowed	= Rs19, 200/Rs24= 800 Kg.
	Standard quantity per unit	= 800kg/80units = 10 kg
	Standard purchase price for Material – 2	= (550liters × Rs180)= Rs99, 000
	Add unfavourable Rate Variance	= Rs6, 600
	Actual cost Price of Material – 2	= Rs1, 05, 600
(3)	Opening balance of Material – 2	= Rs18, 000
	Add Standard Cost of Purchase (550 litres × Rs180)	= Rs99, 000
	Less Closing Balance	= Rs41, 400
	Material-2 Consumed at Standard cost	= Rs75, 600

Ans. 33: (i) Budgeted Machine Hours:

We know that:

$$\text{Volume variance} = \begin{matrix}\text{Std. fixed overhead}\\ \text{rate per hour}\end{matrix}\left(\begin{matrix}\text{Std. machine hours}\\ \text{for actual output}\end{matrix} - \begin{matrix}\text{Budgeted machined hours}\\ \text{for actual output}\end{matrix}\right)$$

or Rs.80,000 (Fav.) = Rs.100 (11,300 – Y)

or 800 = 11,300 – Y

or Y = (11,300 – 800) hours

or Y = 10,500 hours

Hence budgeted machine hours for actual output are 10,500 hours.

(ii) Actual machine Hours: We know that:

$$\text{Efficiency variance} = \begin{matrix}\text{Std. variable overhead}\\ \text{rate per hour}\end{matrix}\left(\begin{matrix}\text{Std. hours for}\\ \text{actual output}\end{matrix} - \begin{matrix}\text{Actual hours}\\ \text{for actual output}\end{matrix}\right)$$

or Rs.36,000 (Fav.) = Rs.60 (11,300 hours – X)

or 600 = 11,300 hours – X

or X = 10,700 hours.

Hence Actual machine hours are 10,700 hours.

(iii) Applied Manufacturing Overhead:

Applied Manufacturing overhead

Actual overhead incurred + Total Variance

= Rs.16,50,000 + Rs.30,000

(Refer to working note)

= Rs.16,80,000

Hence total applied manufacturing overhead are Rs.16,80,000.

(iv) Total Amount of Fixed Overhead Cost:

We know that:

Spending variance = (Flexible budget for actual hours – Actual factory overhead incurred)

Rs.86,000 (Adv.) = 10,700 hours × Rs.60 + total amount of fixed overhead) – Rs.16,50,000)

Rs.86,000 (Adv.) = (Rs.6,42,000 + Total amount of fixed overhead cost (budgeted) – Rs.16,50,000)

Total amount of fixed overhead cost = Rs.10,08,000 – Rs.86,000 = Rs.9,22,000

Total amount of fixed overhead cost = Rs.9,22,000

Working note:

Given that:

Spending variance (Rs.)	86,000 (Adv.)
Efficiency variance (Rs.)	36,000 (Fav.)
Volume variance (Rs.)	80,000 (Fav.)

Therefore,

Total variance = Spending variance + Efficiency variance + Volume variance

= Rs.86,000 (Adv.) + Rs.36,000 (Fav.) + Rs.80,000 (Fav.)

= Rs.30,000 (Fav.)

Alternative approach:

Total factory overhead variance = {factory overhead applied - actual factory overhead incurred}

= (Std. hours for actual output × Budget rate per hour – Actual cost incurred)

= (11,300 hours × Rs.160 – Rs.16,50,000)

= Rs.1,58,000 (Fav.)

Under alternative approach, Applied Manufacturing Overhead and Total Amount of Fixed Overhead Cost would come to Rs.18,08,000 and Rs.10,50,000. Budgeted and actual machine hours would come to 10,500 and 10,700. Spending, Efficiency and Volume Variances would come to Rs.42,000 (Fav.), Rs.36,000 (Fav.) and Rs.80,000 (Fav.) respectively.

Ans. 34: (1) Actual material cost incurred

Material cost variance = Standard cost of material of actual output – Actual material cost incurred

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

= (10,000 units × 2 units× Rs.15 + Rs.50,000)

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

(2) Standard cost of materials actually consumed

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

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

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

(3) Labour efficiency variance (Refer to working note 1)

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

= (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)

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

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

(5) Variable OH expenditure variance (Refer to working note 1)

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

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

(6) Fixed OH efficiency variance (Refer to working notes 1 & 2)

$$= \begin{bmatrix}\text{Standard fixed overhead} \\ \text{rate per hour}\end{bmatrix} - \begin{bmatrix}\text{Standard hour for} \\ \text{actual ouput}\end{bmatrix} - \begin{bmatrix}\text{Actual} \\ \text{hours}\end{bmatrix}$$

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

Fixed OH capacity variance (Refer to working notes 1 & 2)

$$= \begin{bmatrix}\text{Standard variable overhead} \\ \text{rate per hour}\end{bmatrix} - \begin{bmatrix}\text{Actual capacity} \\ \text{hours}\end{bmatrix} - \begin{bmatrix}\text{Budgeted} \\ \text{capacity hours}\end{bmatrix}$$

= Rs.5 (35,000 hours – 50,000 hours) = Rs.75,000 (Adv.)

(7) Fixed OH volume variance (Refer to working note 3)

$$= \begin{matrix}\text{Standard variable overhead} \\ \text{rate per hour}\end{matrix} \begin{pmatrix}\text{Actual} \\ \text{output}\end{pmatrix} - \begin{pmatrix}\text{Budgeted} \\ \text{output}\end{pmatrix}$$

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

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

Working notes:

1. Labour rate variance:

   = (Standard rate per hour – Actual rate per hour) Actual hours (x)

   Or Rs.50,000 = 20x – Rs.6,50,000

   Or x = 35,000 hours

2. Standard hours = 10,000 units × 2 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

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

Total overhead rate per hour = Rs.10

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

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

Ans. 35: Working notes:

1. (a) Budgeted fixed overhead per unit:

   = (Budgeted fixed overheads p.a / Budgeted output for the year)

   = Rs.4,80,000 p.a. / 1,20,000 units = Rs.4 per unit.

   (b) Budgeted fixed overhead hour:

   = Budgeted fixed overhead per unit / Standard labour hours per unit

   = Rs.4 / 2 hours = Rs.2 per hour

2. (a) Standard cost per unit:

	Rs.
Direct material	20
(5 kg × Rs.4/- per kg)	
Direct labour	6
(2 hours × Rs.3/- per hour)	
Fixed overhead	4
(2 hours × Rs.2)	
Total standard cost (per unit)	30

   (b) Budgeted selling price per unit

Standard cost per unit	30
Standard profit per unit	10
(25% on slaes or 33 – 1/3% of standard cost)	
Budgeted selling price per unit	40

3 (a) Actual output units for April, 2001:

   Fixed overhead volume Variance

   = Efficiency variance + Capacity variance

   or (Budgeted output units – Actual output units) Budgeted fixed overhead p.u.

   Rs.2,400 (Favourable) + Rs.4,000 (Adverse) = Rs.1,600 (Adverse)

   or (10,000 units – x units) Rs.4 – Rs.1,600 (Adverse)

   or (10,000 units – 400 units) = x (Actual output units)

   or Actual output units = 9,600 units

   (b) Actual fixed overhead expenses:

(budgeted fixed overhead – Actual fixed overhead) = Fixed overhead expenses variance

or (Rs.40,000 – x) = Rs.1,400 (Favourable)

or x = Rs.40,000 – Rs.1,400

= Rs.38,600

4. (a) Actual sales quantity units: Sales volume variance

$$= \text{Budgeted margin per unit} \begin{pmatrix} \text{Actual sales} \\ \text{quantity units} \end{pmatrix} - \begin{pmatrix} \text{Budgeted} \\ \text{quantity units} \end{pmatrix}$$

= Rs.4,000 (Adverse) = Rs.10 (x – 10,000 units)

or 400 units = x – 10,000 units

or x (Actual sales quantity) = 9,600 units

(b) Actual selling price per units

$$\text{Sales price variance} = \begin{pmatrix} \text{Actual Selling} \\ \text{price per unit} \end{pmatrix} - \begin{pmatrix} \text{Budgeted selling} \\ \text{price per unit} \end{pmatrix} \begin{matrix} \text{Actual} \\ \text{Sales units} \end{matrix}$$

or Rs.9,600 (Fav.) = (x – Rs.40) × 9,600 units

or Actual selling price per unit = Rs.41/-

5. (a) Actual quantity of material consumed:

$$\text{Material usage variance} = \begin{pmatrix} \text{Standard} \\ \text{quantity} \end{pmatrix} - \begin{pmatrix} \text{Actual} \\ \text{quantity} \end{pmatrix} \begin{matrix} \text{Standard price} \\ \text{per unit} \end{matrix}$$

or 6,400 (Adv.) = (9,600 units × 5 kgs.) Rs.4

or x kgs. = 49,600 kgs.

(actual quantity of material consumed)

(b) Actual price per kg:

Actual price per kg.:

Material price variance = (Standard price per kg – Actual price per kg) Actual quantity of material consumed

-Rs.4,960	=	(Rs.4 –Rs. y per kg.) 49,600 kg.
-0.1	=	(Rs.4 – Rs. y per kg)
or y	=	Rs.4.10 per kg.

6. (a) Actual direct labour hour used:

Labour efficiency variance	= (Standard hours – Actual hours) Standard rate per hour
Rs.3,600 (Favourable)	= (9,600 units × 2 hours – p hours) Rs.3
Rs.3,600 (Favourable)	= (19,200 hours – p hours) Rs.3
P hours	= (19,200 hours – 1,200 hours) – 18,000 hours
	(Actual direct labour hours)

(b) Actual direct labour hour rate:

$$\text{Labour rate variance} = \left(\begin{matrix}\text{Standard}\\ \text{rate per hour}\end{matrix} - \begin{matrix}\text{Actual rate}\\ \text{per hour}\end{matrix}\right)\begin{matrix}\text{Actual Direct}\\ \text{labour hours}\end{matrix}$$

Rs.3,600 (Adverse) = (Rs.3 per hour – t per hour) 18,000 hours

or t = Rs.3 + Rs.0.20 – Rs.3.20 per hour

(actual direct labour hour rate)

7. Actual fixed overheads:

Fixed overhead expense variance = Budgeted fixed overhead – Actual fixed overhead

or Rs.1,400 (Favourable) = 10,000 units × Rs.4 p.u. – Actual fixed overhead

or Actual fixed overhead = Rs.40,000 – Rs.1,400

or Actual fixed overhead = Rs.38,600

Annual financial Profit /Loss Statement

(for April, 2001)

Account	*Qty./ Hours*	*Rate/Price*	*Actual/ Value*
(a)	*(b)*	*(c)*	*(d)=(b)×(c)*
Sales: (A)	9,600 units	41	3,93,600
(Refer to working note 4)			
Direct Materials	49,600 kgs.	4.10 per kg.	2,03,360
(Refer to working note 5)			
Direct labour	18,000 hours	3,20 per hour	57,600
(Refer to working note 6)			
Fixed Overheads	18,000 hours	2.14444 per hour	38,600
(Refer to working note 6 (a) and 7)			
(Rs.38,600/18,000 hours)			
(absorbed on direct labour hour basis)			
Total costs: (B)			2,99,560
Profit : [(A) – (B)]			94,040

Ans: 36.

Working notes:

1. Direct material units in actual output

		(Units)
Output of units produced		7,620
Add: Closing WIP units	(200 units x 50% complete)	100
Less: Opening WIP units	(300 units x 100% complete)	(300)
Total direct material units in actual output	(work done)(i.e. units introduced)	7,420

2. Basic data of direct materials

Standard Data			Actual output units Actual Data		7,420
Standard quantity of material	S.P./ KG. Rs.	Amount Rs.	Actual qty. of material kgs.	A.P./KG. Rs.	Amount Rs.
11.130 (7,420 units x 1.5 kgs.)	24	2,67,120	11,224	23.75	2,66,570

3. Direct wages and overhead units in actual output **(Units)**

Output of units produced		7,620
Add: Closing WIP units	(200 units x 40% complete)	80
Less: Opening WIP units	(300 units x 60% complete)	(180)
Total direct wages and overhead units in actual output (work done)(i.e. units introduced)		7,520

4. Basic data of direct wages

Standard Data			Actual output units Actual Data		7,520
Standard Labour hours	S.W./ hour Rs.	Amount Rs.	Actual Labour hours	A.W./ hour Rs.	Amount Rs.
22,560 (7,520 units x 3 hours)	400	90,240	22,400	4.30	96,320

5. Budgeted variable overhead per unit = $\frac{\text{Difference in factory overhead}}{\text{Difference in output}}$

= $\frac{\text{Rs.92,400 – Rs.81,600}}{\text{(7,500 units – 6,000 units)}}$

=Rs.7.20 per unit

6 Budgeted fixed overheads **(Rs.)**

Total overhead on 8,000 units	(8,000 units x 12 0	96,000
Less: Variable overhead of	8,000 units @ Rs.7.20 per unit	(57,600)
Budgeted fixed overheads		38,400

7. Basic data for variable overhead

Budgeted data		Actual data	
Budgeted variable overhead	Rs.53,760	Actual variable overhead	Rs.58,240
For actual hours (22,400 hours x Rs.2.40		Actual output units	7,520
Standard hours required per unit	3	Actual hours	22,400
Standard variable overhead rate p.u	Rs.7.20	Actual variable overhead Recovery rate per hour	Rs.2.60
Standard variable overhead rate p.u.	Rs.240		

8. Basic data for fixed overhead

Standard / Budgeted data		Actual data	
Budgeted fixed overhead	Rs.38,400	Actual fixed overhead (Rs.96,440 – Rs.58,240)	Rs.38,200
Budgeted output	8,000 units	Actual output	7,520 units
Budgeted hours	24,000	Actual hours	22,400
Standard fixed overhead rate per hour	Rs.1.60		
Standard fixed overhead p.u	Rs.4.80		
Standard hours required p.u.	3		

Computation of Variances:

Material variances

1. Material usage variance = (S.Q.-A.Q.) S.P.
   = (11,130 kgs.-11,224 kgs.) Rs.24 =Rs.2,256 (A)

2. Material price variance = (S.P.-A.P.) A.Q
   = (Rs.24-Rs.23.75) 11,224 kgs. =Rs.2,806 (F)

3. Material cost variance = (S.C.-A.C.)
   = (Rs.2,67,120-Rs.2,66,570) =Rs.550 (F)

Labour variances

1. Labour efficiency variance = (S.H.-A.H.) S.R.

= (22,500 hours- 22,400 hours) Rs.4 =Rs.640 (F)

2. Labour rate variance = (S.R.-A.R.) A.H
= (Rs.4-Rs.4.3) 22,400 hours =Rs.6,720 (A)

3. Labour cost variance = (S.C.-A.C.)
= (Rs.90,240 - Rs.96,320) =Rs.6,080 (A)

Variable Overhead variances
1. Variable overhead Expenditure variance ={ Budgeted variable overhead – Actual variable overhead}
= (Rs.53,760 – Rs.58,240) =Rs.4,480 (A)
2. Variable overhead Efficiency variance =Standard variable overhead rate per hour {Standard hrs. – Actual hrs}
=Rs.2,40 (22,560 hrs – 22,400 hrs) =Rs.384 (F)

3. Total variable overhead cost variance = { Standard variable overhead –Actual variable overhead}

= (7,520 units x Rs.7.20 – Rs.58,240) =Rs.4,096 (A)

Fixed Overhead variances
1. Expenditure variance ={ Budgeted fixed overhead – Actual fixed overhead}

= (Rs.38,400 – Rs.38,200) =Rs.200 (F)
2. Volume variance = { Budgeted volume – Actual volume} Standard fixed overhead rare per unit

=(8,000 units – 7,520 units) Rs.4.80 =Rs.2,304 (A)

3. Efficiency variance = { Standard hours for actual production –Actual hours} Standard fixed overhead rate per hour

= 22,560 hours – 22,400 hours) Rs.1.60 =Rs.256 (F)
4.Capacity variance ={Budgeted hours – Actual Hours } standard fixed overhead rate per hour
= (24,000 hours – 22,400 hours) Rs.1.60 =Rs.2,560 (A)

5.Total fixed overhead cost variance ={Fixed overhead recovered – Actual overhead}
={7,520 units x Rs.4.80 – Rs.38,200} =Rs.2,104 (A)

Ans. 37:

Statement of Equivalent Production in Units

Particulars	*Materials*		*Wages & Overhead*	
	% age	*Units*	*%age*	*Units*
Units Completed	100%	9000	100%	9000
Closing W.I.P.	100%	900	50%	900
Equivalent Units		9900		9900

Material Variances

	*Standard qty for actual output ** x std price*		*Actual qty X actual price*	
Material A	19,800 @ 3	= 59,400	22,275@2.8*	= 62,370
Material B	9,900 @ 4	= 39,600	10,889 @4.1*	= 44,649
	29,700	99,000	33,165	1,07,019

*Actual Cost / Actual Quantity

** Standard Quantity for actual output = (std qty/ budgeted prod) x actual output

MCV= TSC – TAC

= 99,000 – 1,07,019 = 8,019 (A) MPV = AQ (SP – AP)

A = 22,275 (3 – 2.80) = 4,455 (F)

B = 10,890 (4 – 4.10) = 1,089 (A)

3,366 (F)

MUV = SP (SQ – AQ)

A = 3 (19,800 – 22,275) = 7,425 (A)

B = 4 (9,900 – 10,890) = 3,960 (A)

11,385 (A)

MMV = SP (RSQ – AQ)

A = 3 {19,800 ÷ 29,700 × 33,165 – 22,275} = 495 (A)

B = 4 {9,900 ÷ 29,700 × 3,165 – 10,890} = 660 (F)

165 (F)

MYV = S. C Per Unit (S. O. For Actual Mix – A. O.)

= 99,000 ÷ 9,900 {9,900 ÷ 29,700 × 33,165 – 9,900}

= 10 (11.055 – 9,900) = 11,550 (A)

Labour Variances:

LCV = TSC – TAC

= 2,40,000 ÷ 12,000 × 9,450 – 1,91,250 = 2,250 (A)

LRV = AH (SR – AR)

= 48,000 {4 – (1,91,250 ÷ 48,000)} = 750 (F)

LITV = No. of Idle hours × SR

= 48,000 – (47,500 ÷ 4) = 1,200 (A)

LEV = SR (SH – AH)

= 4 {(60,000 ÷ 12,000) × 9,450 – 47,700} = 1,800 (A)

(ii) Variable Overhead Variances

VOC = Recovered Overheads – Actual Overheads

= 9,450 × 5 – 45,000 = 2,250 (F)

V.O (Exp.) V = Standard V.O. – Actual V.O.

= 47,700 × 1 – 45,000 = 2,700 (F)

V.O. (Eff.) V = Recovered Overheads – Standard Overheads

= 9,450 × 5 – 47,700 = 450 (A)

Fixed Overheads Variances

FOCV = Recovered Overheads – Actual Overheads

= (1,20,000 ÷ 12,000) × 9,450 – 1,20,900 = 94,500 – 1,20,900

= 26,400 (A)

F.O.(Exp.) V = Budgeted Overheads – Actual Overheads

= 1,20,000 – 1,20,900 = 900 (A)

FOVV = Recovered Overheads – Budgeted Overheads

= 95,500 – 1,20,000 = 25,500 (A)

Sales Variances

Sales Price Variance = Actual Unit Sold (SP – AP)

= 9,000 {50 – (4,57,500 ÷ 9,000)} = 7,500 (F)

Sales Volume Variance (Contribution Loss)

= S. R. of Profit (Budgeted Qty. – Actual Qty.)

= (60,000 ÷ 12,000) (12,000 – 9,000) = 15,000 (A)

Ans 38:.

(a) sales Variance

Present Market size =60,000 units.

At 16% the share should have been = 60,000 x $\frac{16}{100}$ =9,600 units.

Standard Gross Margin : SP Rs.53 – (DM Rs.9 + DL Rs.24 + VO Rs.4 + FO Rs.12) = Rs.4

Budgeted Qty.	Revised Budgeted Qty	Actual Qty. Booked	Actual Qty. Supplied	Std. Gross Margin (Rs.)
8,000	9,600	8,200	7,500	4

(Rs.)

Budgeted Qty. x Std. G.M.	Revised Budgeted Qty x Std. G.M.	Actual Qty. Booked x Std. G.M.	Actual Qty. Supplied x Std.G.M.	Actual G.M.	Actual Qty. supplied x Actual G.M.
32,000	38,400	32,800	30,000	5	37,500

Market size variance 32,000 - 38,400 =6,400 F

Market share variance 38,400 – 32,800 =5,600 A

Sales volume variance 32,800 – 30,000 =2,800 A

Sales price variance 30,000 – 37,500 =7,500 F

Sales Margin Production Quantity Variance = (7500-8200)X4 = 2800 A

[Note: Since actual order received ≠ actual sales quantity, Market share variance will be on the basis of actual order received and we will also calculate one further variance regarding inefficiency of production department about fulfilling order quantity, Sales Margin Production Quantity Variance = (Actual sales quantity – Sales order quantity) × Std. margin p.u. While calculating all other variance sales order quantity shall be ignored.]

(b) Direct Material Variances (Units)

Production	7,500
- Op. Stock	600
+ Cl. Stock	300
Introduced	7200

Std. requirement 7,200 units @ 1.5 kg. =10,800 kg.

Std. Qty.	Actual Qty.	S.P. Rs.	Std. Qty. x SP Rs.	Actual Qty. x SP Rs.	AP Rs.	Actual Qty. x AP Rs.
10,800	12,000	6	64,800	72,000	6/50	78,000

Usage Variance Rs.64,800 – Rs.72,000 =Rs.7,200 A

Price Variance Rs.72,000 – Rs.78,000 =Rs.6,000 A

Total Variance Rs.64,800 – Rs.78,000 =Rs.13,200 A

(c) Direct Labour Variance

Production		7,500
Less: Op. Stock	600 x 75/100	450
Add: Cl. Stock	300 x 60/100	180
		7,230

Std. hours produced
7,230 x 4 = 28,920

Std. Hours	Actual Hours	S.R. Rs.	Std. Hrs. x SR Rs.	Actual Hrs. x SR Rs.	AR Rs.	Actual Hrs. x AR Rs.
28,920	29,000	6	1,73,520	1,74,000	6 / 25	1,81,250

Efficiency Variance (1,73,520 – 1,74,000) =480 A
Rate Variance (1,74,000 – 1,81,250) =7,250 A
Total variance =7,730 A

(d) Variable Overheads Variance

		Rs.		
A	=Charged to Production 28,920 x 1	28,920	Efficiency variance	=Rs.80A
B	=Std. Cost of Actual Hours 29,000 x 1	29,000	Expenditure variance	=Rs.7,000 A
C	=Actual Overheads	36,000		
		A – C Total V		=Rs.7,080 A

(e) Fixed Overhead Variance

				(Rs.)
A	=	Charged to Production	28,920 x 3	86,760
B	=	Std. Cost of Act. Hrs.	29,000 x 3	87,000
C	=	Budget		96,000
D	=	Actual		94,000

Efficiency Variance (86,760 – 87,000) =Rs.240 (A)
Volume Variance (86,760 – 94,000) =Rs.9,240 (A)

Ans. 39:

		Rs.
(1)	Budgeted contribution = Budgeted Profit + Budgeted Fixed Cost	15,000 + 15,000 = 30,000
	Plus Contribution quantity variance	1,800
	Total Standard contribution	31,800
	Standard Contribution per unit	3
	Actual Sales Volume	10,600 units
(2)	Actual Sales Volume 10,600 × 17	1,80,200

(3) Actual quantity of Raw Materials used

Standard consumption 10,600 × 5		2,000 Kgs.
Add: Material Usage Variance $\frac{400}{.2}$		2,000 kgs.
Actual consumption		55,000 Kgs.

(4) Labour Efficiency variance

Standard labour cost for Standard hours	(63,000 + 600)	63,600
Standard labour cost for actual hours		61,950
Labour efficiency variance		1,650 F

(5) Actual variable overhead

Selling Overhead variance – Variable overhead Rs. 84,800 – Rs. 1,800 = Rs. 83,000

(6) Variable Overhead efficiency variance

Actual hours (AH)	$\frac{61,950}{1.5}$	41,300 hours
Standard hours (SH)	60,600 × 4	42,400 hours
Standard rate per hour (SR)	$\frac{63,600}{10,600 \times 4}$	Rs. 1.5

Efficiency variance SR (SH – AH) = 2 (42,400 – 41,300) = 2,200F

(7) Actual fixed overheads: Budgeted Overhead + Fixed Overhead variance = 15,000 + 600 = Rs. 15,600.

(8) Operating profit variance

If budgeted profit is considered (15,000 – 7,000) = Rs. 8,000 adverse

If standard profit is considered (16,800 – 7,000) = Rs. 9,800 adverse

Ans. 40:

Computation of Yield Variance for 'A' and 'B'

DM yield variance for 'A' = [Std qty of all DM allowed for actual output - Actual total qty of all DM used] × Std Mix %age of 'A' × Std price of 'A'

= [SQ_A - RSQ_A] × Std price of 'A'

Where RSQ_A = Revised Standard Quantity of 'A' = (Actual total qty of all DM used) × Std Mix %age of 'A' and

SQ_A = Standard Quantity of DM 'A' for Actual Production = Standard quantity of all DM allowed for actual output × Std Mix %age of 'A'

DM yield variance for 'B' = [Std qty of all DM allowed for actual output - Actual total qty of all DM used] × Std Mix %age of 'B' × Std price of 'B'

= [SQ_B - RSQ_B] × Std price of 'B'

Where RSQ_B = Revised Standard Quantity of 'B' = (Actual total qty of all DM used) × Standard Mix %age of 'B' and

SQ_B = Standard quantity of DM 'B' for Actual Production = Standard quantity of all DM allowed for actual output × Standard Mix %age of 'B'

Since Standard Mix %age is the same for both 'A' and 'B' (1:1) we have, Total Yield variance for 'A' and 'B'= T × (Std price of 'A' + Std price of 'B')
Where T = (Std qty of all DM allowed for actual output - Actual total qty of all DM used)× 0.5

As Total Yield variance for 'A' and 'B' is given as – Rs 270, we have

- Rs 270 = T × Rs 24 + T × Rs 30

Or T = - 5

Hence Yield Variance for 'A' = - 5 × 24 = - Rs 120 and

Yield variance for 'B' = - 5 × 30 = - Rs 150. Also
$(SQ_A - RSQ_A) \times 24 = -120$ or $SQ_A - RSQ_A = -5$
Similarly

$(SQ_B - RSQ_B) \times 30 = -150$ or $SQ_B - RSQ_B = -5$

Alternative 1

Let total actual quantity consumed; X kg. Then, Quantity of A = X – 70

RSQ = $\frac{X}{2}$ of A & $\frac{X}{2}$ of B. (Since the Mix ratio is 1:1)

The Standard input for both 'A' and 'B' will be 0.5X – 5

Since Cost Variance for 'A' is given to be nil, we have, $(SP_A \times SQ_A) - (AQ_A \times AP_A) = 0$
i.e. $24 \times (0.5X - 5) - (X - 70) \times 30 = 0$

or X = 110 Kgs

Therefore Actual Input for 'A' = 110 – 70 = 40 Kgs

Also, Standard Input for 'A' and 'B' will be $\left(\frac{110}{2} - 5\right)$ = 50 Kgs. Using this quantity in the Cost Variance of 'B' , the actual price per kg of 'B' (AP_B) will be ,

$50 \times 30 - 70 \times AP_B = -1{,}300$

Or AP_B = Rs 40.

Alternative 2

Let the standard input of 'A' = X kg. Therefore, the total standard input for 'A' + 'B'= 2X Actual input = (2X + 10) Kgs. ∴ Actual input for 'A' = (2X +10 – 70)= (2X – 60)Kgs Forming the equation for nil cost variance of 'A'.

Rs. 24 × X – Rs. 30 × (2X – 60) = 0

Or X = 50 Kgs. Using this quantity in the Cost Variance of 'B', the actual price per kg. of 'B' (AP_B) will be ,

$50 \times 30 - 70 \times AP_B = -1{,}300$

Or AP_B = Rs. 40.

Alternative 3

Let the actual input of 'A' =X
Then the total actual input = (X + 70). Therefore, RSQ of 'A' and 'B' each = 0.5X + 35 and Standard Input of 'A' and 'B' each = 0.5X +30.

Forming the equation for nil cost variance of 'A', we have,

$24 \times (0.5X + 30) - 30 \times X = 0$

Or X = 40 Kgs.

∴ Standard Input will be 50 Kgs. Using this, quantity in the Cost Variance of 'B', the actual price per kg. of 'B' (AP_B) will be,

$50 \times 30 - 70 \times AP_B = -1{,}300$

Or AP_B = Rs. 40.

Substituting various values for quantity and price, we get the following table.

	(1)	(2)	(3)	(4)
	Std. Price × SQ	Std. Price × RSQ	Std. Price × Actual Qty.	Actual Price × Actual Qty.
A	24 × 50 = 1200	24 × 55 = 1320	24 × 40 = 960	30 × 40 = 1200
B	30 × 50 = 1500	30 × 55 = 1650	30 × 70 = 2100	40 × 70 = 2800
	2700	2970	3060	4000

	(1) – (2)	(2) – (3)	(1) – (3)	(3) – (4)	(1) – (4)
	Yld variance	Mix variance	Usage variance	Price variance	Cost variance
A	1200 – 1320 = 120(A)	1320 – 960 = 360(F)	1200 – 960 = 240(F)	960 – 1200 = 240(A)	1200 – 1200 = 0
B	1500 – 1650 = 150(A)	1650 – 2100 = 450(A)	1500 – 2100 = 600(A)	2100 – 2800 = 700(A)	1500 – 2800 = 1300(A)
	270A)	90A)	360A)	940A)	1300A)

Actual Output = 90 Kgs.

(Actual output and standard output are always equal numerically in any material variance analysis)

Standard output = Standard input – Standard loss or 100 – 10 = 90 Kgs.

Ans. 41: Working Notes

a) Computation of Standard Price per kg of Material

Let 'x' be the standard price per kg

Direct material price variance	= Rs. 15,750 (A) (given)
A.Q. (S.P. – A.P.)	= DMVP
63,000 kgs (x – 3.25)	= -15,750
63,000 x – 2,04,750	= -15,750
63,000x	= 1,89,000
x	= 1,89,000 / 63,000 = 3

∴ Standard price per kg of material is Rs. 3

b) Computation of Standard Quantity of material for actual output

Let 'x' be the standard quantity

Direct material usage variance	= Rs. 27,000 (A) (given)
S.P. (S.Q. – A.Q.)	= DMUV
3(x – 63,000)	= -27,000
3x – 1,89,000	= -27,000
3x	= 1,62,000
x	= 1,62,000/ 3 = 54,000

∴ Standard Quantity for actual output is 54,000 kgs.

c) Computation of Standard Labours hours per unit
Let 'x' be the Standard labour hours per unit
D.L. rate variance + D.L. efficiency variance =D.L. Cost Variance
Rs. 6,840 (A) + Rs. 10,800 (F) = Rs. 3,960 (F)
Direct labour cost variance = Rs. 3,960 (F) (given)
Standard cost of Standard hours – Actual cost of actual hours = Rs. 3,960 (F)
(x X Rs.6) – (Rs. 2,12,040 = Rs. 3,960 (F)
6x = Rs. 2,16,000
x = 2,16,000 / 6 = 36,000

∴ Standard hours for actual output is 36,000 hours
Standard hours per unit = 36,000 hours/ 18,000 units = 2 hrs.

d) Computation of Actual Hours per unit
Let 'x' be actual hours
Direct labour efficiency variance = Rs. 10,800 (F) (given)
(Standard hours – Actual hours) Std. rate = DLEV
[(18,000 units X 2) – x] Rs. 6 = Rs. 10,800 (F)
2,16,000 – 6x = 10,800
6x = 2,16,000 – 10,800
x = 34,200

∴ Actual labour hours are 34,200 for actual output
Actual labour hours per unit = 34,200 hrs / 18,000 units = 1.9 hrs.

e) Computation of Standard variable overhead per hour
Budgeted fixed overheads – Actual fixed overheads = Fixed overhead expense variance
Let Budgeted fixed overheads be 'x'
FOEV = Rs. 25,000 (A) (given)
x – Rs. 3,25,000 = Rs. 25,000 (A)
x = 3,25,000 – 25,000 = 3,00,000

∴ Budgeted fixed overheads is Rs. 3,00,000
Standard fixed overhead rate per unit = Rs. 3,00,000/ 20,000 units = Rs. 15 per unit Standard fixed overhead rate per hour = Rs. 15 / 2 hours = Rs. 7.50 per hour

f) Computation of Budgeted selling price per unit
Let 'x' be the budgeted selling price per unit
Sales price variance = Rs. 45,000 (F) (given)
Actual quantity (Actual selling price – Budgeted selling price) = Sales price variance
18,000 units (Rs. 67.50 – y) = Rs. 45,000 (F)
12,15,000 – 18,000y = 45,000
18,000y = 12,15,000 – 45,000
y = 11,70,000 / 18,000 = 65

∴ Budgeted selling price is Rs. 65 per unit.

Budgeted Sales			Actual Sales		
Quantity (Units)	Price (Rs. p.u.)	Amount Rs.	Quantity (Units)	Price (Rs. p.u.)	Amount Rs.
20,000	65	13,00,000	18,000	67.50	12,15,000

Statement showing Standard Cost per unit and Budgeted Profit for 20,000 units.

Particulars		Per Unit	For 20,000 Units
Sales	(a)	65	13,00,000
Costs:			
Direct Material		9	1,80,000
Direct Labour		12	2,40,000
Variable Overhead		16	3,20,000

Fixed Overhead		15	3,00,000
Total Cost	(b)	52	10,40,000
Standard Gross Margin		13	2,60,000

(ii) Computation of sales gross margin volume and fixed overheads volume variances

Sales Gross Margin Volume Variance

= Standard Margin per unit (Actual Quantity – Budgeted Quantity)

= Rs. 13 (18,000 units – 20,000 units) = Rs. 26,000 (A)

Fixed Overhead Volume Variance

= Standard fixed overhead rate per unit (Actual output – Budgeted output)

= Rs. 15 (18,000 units – 20,000 units) = Rs. 30,000 (A)

Operating Statement Reconciling the Budgeted Profit with Actual Profit			(Rs.)
Budgeted Profit (20,000 units X Rs. 13 p.u.)			2,60,000
Sales Margin Volume Variance			26,000 (A)
Standard Profit			2,34,000
Sales Price Variance			45,000 (F)
			2,79,000
Cost Variances:	Favourable	Adverse	
Direct Material Price Variance	-	15,750	
Direct Material Usage Variance	-	27,000	
Direct Labour Rate Variance	-	6,840	
Direct Labour Efficiency Variance	10,800	-	
Variable Overheads Expense Variance	-	3,420	
Variable Overheads Efficiency Variance	14,400	-	
Fixed Overheads Expense Variance	-	25,000	
Fixed Overheads Volume Variance	-	30,000	
	25,200	1,08,010	82,810 (A)
Actual Profit			1,96,190

Ans: 42:

Reconciliation Statement of Actual profit and Standard profit. (Rs)

Budgeted Profit	(10,000 @ Rs.32)	3,20,000
Less: Sales volume variance (Adverse)	(Rs.32 (8,000-10,000)	64,000
Standard profit	(8,000 units @ Rs.32)	2,56,000

Cost Variances:		Adverse	Favourable	
1. Direct Materials				
(i) Price variance	16,500(Rs.20-Rs.24)	66,000		
(ii) Usage Variance	Rs.20 (16,000-16,500)	10,000		
2. Direct labour				
(i) Labour rate variance	1,70,000(Rs.2.00-Rs.2.04)	6,800		
(ii) Labour efficiency variance	Rs.2 (1,60,000-1,66,000)	12,000		
(iii) Idle time variance	(Rs.2.00 x 4,0000	8,000		
3. Variable Overheads	(Rs.8 x 8,000) – Rs.60,000	4,000		
4. Fixed Overheads				
(i) Expenses variance	(Rs.20 x 10,000) –Rs.1,84,000	16,000		
(ii) Efficiency variance	Rs.20 (8,000 – 8,300)	6,000		
(iii) Capacity variance	Rs.20 (8,300 – 10,000)	34,000		
Total		1,42,800	20,000	
Less: Net Adverse variance				1,22,800
Actual profit for the period				1,33,200

Ans. 43: (b)

Working notes:

		Ravi	Richard	Rahim	Roop Singh
(i)	*Standard sales units :* Sales quota ÷ Rs. 400	1,875	2,250	2,875	1,500
(ii)	*Standard selling expenses per unit (Rs.)* (Std. selling expenses/Std. sales units)	120	110	100	150
(iii)	*Actual sales units :* Actual sales÷Rs. 400	2,000	2,500	2,625	1,300
(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

	Rs.	Rs.	Rs.	Rs.	Total (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) (F)	7,500 (A)	(39,375) (A)	(52,000) (A)	(1,03,875) (A)

A = Adverse
F = Favourable

Ans 44:

Statement showing the computation of standard cost of production of shirts

Lot no.	Units (Dozen)	Cost per Dozen	Total standard cost(Rs.)
45(UK)	1,700	531.00	9,02,700
46(US)	1,200	477.60	5,73,120
47(CAN)	1,000	531.00	5,31,000
Total			20,06,820

Cost per Dozen of 46 (US) lot. (Rs.)

Material cost 100%	264.00
Conversion cost 80%(80%of Rs.267)	213.60
Total	477.60

Statement of material used and its variance

Lot no.	Output	Std. Qty	Total Total	Variation

	Dozen	per Dozen (Mtrs.)	Std. qty. (Mtrs.)	Actual Qty. (Mtrs.)	
45(UK)	1,700	24	40,800	40,440	360(F)
46(US)	1,200	24	28,800	28,825	25(A)
47(CAN)	1,000	24	24,000	24,100	100(A)
Total			93,600	93,365	235(F)

Statement of labour hour worked and its variance

Lot no.	Output Dozen	Std.labour hour per Dozen	Total labour hours	Total actual labour hours	Variation (Hours)
45(UK)	1,700	3	5,100	5,130	30(A)
46(US)	1,200	3	2,880	2,980	10(A)
47(CAN)	3,000	3	3,000	2,890	20(F)
Total			10,980	11,000	20(A)

(a) calculation of variances

(1) material price variance
actual quantity (standard rate –actual rate)
= (95,000 metres *Rs. 11)-Rs.10,64,000
= Rs.10,45,000-Rs. 10,64,000 =Rs. 19,000(A)

(2)labour rate variance
actual hour (Std. rate per hour – actual rate per hour)
= 11,000 (Rs. 49-Rs.50) = Rs.11,000(A)

(3) variable overhead efficiency variance
Std. variable overhead rate per hour (Std.hour –actual hour)
= Rs. 24(10980-11,000) = Rs. 16,320(A)

Working Notes :

(1) standard variance overhead rate per hour
= 40*60/100 = Rs.24

(2) standard fixed overhead rate per hour

= Rs. 40*40/100= Rs. 16

Ans: 45.

1. **Sales variances**

(5) Sales Volume Margin Variance
(Std. Margin on actual Sales – Budgeted Margin)
=(Rs.25,000 units x Rs.6) – (36,000 units x Rs.6)
=(Rs.1,50,000 – Rs.2,16,000) =Rs.66,000 (A)

(6) Sales Price Variance
(Actual Sales at actual price – Actual Sales at Std. Price)
=(25,000 Units x Rs.51.50)-(25,000 units x Rs.50)
=(Rs.12,87,500 – Rs.12,50,000) =Rs.37,500 (F)

2. **Material variances**

(1) Material Price Variance
(Std Cost of Material Used- Actual Material Cost
=(96,000 kgs x Rs.2) – (96,000 kg. x Rs.2.25)
=(Rs.1,92,000 – Rs.2,16,000) =Rs.24,000(A)

(3) Material Usage Variance
Std Material cost of Actual production- Std. Cost of Material used)

=(1,00,000 kgs. x Rs.2) – (96,000 Kgs. x Rs.2)
=(Rs.2,00,000 – Rs.1,92,000) =Rs.8,000 (F)

3. Labour Variances

(1) Labour Wages Rate Variance
(Actual Labour hrs. at Std. rate- Actual Labour Wages)
=(1,60,000 hrs x Rs.4) – (1,60,000 hrs. x Rs.4.10)
=(Rs.6,40,00 – Rs.6,56,000) =Rs.16,000 (A)

(2) Labour Efficiency Variance
Std. Labour Wages for actual production –Actual Labour hours worked at Std. rate)
=(1,50,000 hrs. x Rs.4) –(1,54,000 hrs. xRs.4)
=(Rs.6,00,000 – Rs.6,16,000) =Rs.16,000 (A)

(3) Idle Time variance
(6,000 hrs. x Rs.4 variance) =Rs.24,000 (A)

4. Variable Overhead Variances

(1) Total Variable overhead Variance
(Allowed Expenditure for actual hours-Actual variable overheads)
=Rs.(1,84,000 – Rs.1,82,000) =Rs.2,800 (F)

(2) Variable overhead Efficiency Variance
(Allowed Expenditure for Std. hours- Allowed Expenditure for actual hours)
=(Rs.1,50,000 hrs. x Rs.1.20)- 1,54,000 hrs. x Rs.1.20)
=(Rs.1,80,000 – Rs.1,84,800) =Rs.4,800 (A)

5. Fixed Overhead Variances

(1) Fixed Overhead Expenditure variance
(Budgeted Expenditure – Actual Expenditure)
=(Rs.1,44,000 – Rs.1,50,000) =Rs.6,000 (A)

(2) Fixed Overheads Efficiency variance
(Std. hours of production x Std. fixed overhead recovery rate per hour)-(Actual hours worked x Fixed overhead recovery rate per hour)
=(Rs.1,50,000 hrs. x Re.0.80)-(1,54,000 hrs. x Re.0.80)
=(Rs.1,20,000 – Rs.1,23,200) =Rs.3,200(A)

(3) Fixed Overhead Capacity variance
(Actual hours worked x Fixed overhead recovery rate per hour)-(Std. Fixed overhead recovery r rate per hour x Budgeted capacity hours)
=(1,54,000 hrs. x 0.80)-(Re.0.80 x 1,80,000 hrs.)
=(Rs.1,23,200 – Rs.1,44,000) =Rs.20,800(A)

A. Std. Variable Overhead Rate per hour.

$$= \frac{\text{Std. Variable Overheads}}{\text{Total Std. hours}}$$

$$= \frac{\text{(30,000 units x Rs.12)-Rs.1,44,000}}{\text{1,80,000 units}} = \text{Rs.1.20}$$

B. Std Fixed Overheads rate per hour

$$= \frac{\text{Budgeted Overheads}}{\text{Budgeted hours}}$$

=Rs.1,44,000 / 1,80,000 hrs. =Rs.0.80

Statement of actual profit / loss for the second quarter of the year **(Rs.)**

Direct Material	(96,000 kgs.@Rs.2.25)	2,16,000
Direct Wages	(1,60,000 hrs. ‘ Rs.4.10)	6,56,000
Overhead		3,32,000
	Total Cost	12,04,000
Sales Revenue	(25,000 units @ 51.50)	12,87,500
Actual Profit		83,500

Operating Statement reconciling the budgeted profit with actual profit (Rs.)

Particulars	Reference to working note	Variance		Actual
		Favourable	Adverse	
Budgeted profit (36,000 units x Rs.6)	-	-	-	2,16,000
1. Sales – Volume Margin Variance	(1)	-	66,000	-
Price Variance	(2)	37,500	-	-
Profit before adjustment of Cost Variances				1,87,500
II Material - Price	(1)	-	24,000	
- Usage	(2)	8,000	-	
III. Labour - Rate	(1)	-	16,000	
-Efficiency	(2)	-	16,000	
-Idle time	(3)	-	24,000	
IV. V. Overheads -Expenditure	(1)	2,800	-	
-Efficiency	(2)	-	4,800	
V. F. Overheads -Expenditure	(1)	-	6,000	
- Efficiency	(2)	-	3,200	
-Capacity	(3)	-	20,800	1,04,000
Actual Profit		10,800	1,14,800	83,500

Ans. 46:

Expenses	*Overhead Expenses Schedule*			
	Budget: 120 Std. Hours		*Actual: 156 Hours*	
	Rate per hour Rs.	Expenses Rs.	Rate per hour Rs.	Expenses Rs.
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) Or

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)

Ans. 47: 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)*		
Ma	*Qty.*	*Price*	*Amount*	*Qty.*	*Price*	*Amount*	*Actual Qty.*	*Standard Price/kg*	*Amount*
	Kg.	Rs.	Rs.	Kg.	Rs.	Rs.	Kg.	Rs.	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

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

(2) Statement showing standard and actual labour cost of 1,000 units produced and standard cost of actual labour hrs.

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

(3) Overheads

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

Computation of material variances (Refer to Basic data 1): 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 kg (Rs.10 – Rs.11) + 5,200 kg (Rs.6 – Rs.5.50)

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

= Rs.8,400 (Adv.)

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

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

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

= Rs.8,800 (Fav.)

Material mix variance = Total actual quantity $\left\{\begin{matrix}\text{Std. price of} \\ \text{Std. mix per kg}\end{matrix} - \begin{matrix}\text{Std. price of} \\ \text{16,200 kg}\end{matrix}\right\}$

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

= Rs.1,741.18 (Fav.)

Material yield variance = Std. Rate (Actual yield – Std. Yield

= Rs.150 (1,000 units – 952.9411764 units)

= Rs.7058.82

Material purchase price variance:

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

= 12,000 kg (Rs.10 – Rs.11) + 5,000 kg (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 – 1,000 units) = Rs.3,500 (Adv.)

Efficiency variance:

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

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

Ans. 48: (i) Working Notes:

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

   Actual output of EXE (units)

   Standard output per kg. of raw material (units)

   Standard quantity of raw material required for actual output (kgs.)

   (4,680 units / 12 units)

   Standard cost of 390 kgs. of raw material at Rs.60 per kg. (Rs.)

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 of actual hours*	*Actual cost hours*	*Rate p.h.*	*Amount*
2,340	5	11,700	12,000	240	4.80	1,152
(4,680 units ×½ 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.) (for 1 week)	24,400	Actual fixed overhead (Rs.)	19,800
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 (Adverse)

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 – 4,800units)

= Rs.510 (Adv.)

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		
4,680 units × Rs.15		70,200
Less: Standard cost of :		
Direct material	23,400	
Direct labour	11,700	
Overheads	19,890	54,990
(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)	1,400 (A)	

Labour:		
Rate Variance : 16 (A)		
Efficiency variance : 300 (A)	316 (A)	
Overhead:		
Expenditure variance: 600 (F)		
Volume variance: 510 (F)	90 (F)	1,626
Actual Profit		13,584

Ans.49:

Sales variances (Sales Value Method)

Budgeted Calculations:

	Budgeted Sales			Actual Sales			
Product	*Qty. Units*	*Rate Rs.*	*Amount Rs.*	*Qty. Units*	*Rate Rs.*	*Amount Rs.*	*Actual quantity × Budgeted price 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** = 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)

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

= 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	Rs.	Rs.	Units	Rs.	Rs.	Rs.
A	10,000	5	50,000	11,000	4.50	49,500	55,000
B	6,000	6	36,000	5,000	6.10	30,500	30,000
C	8,000	3	24,000	9,000	2.55	22,950	27,000
	24,000		1,10,000	25,000		1,02,950	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

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

= Rs. 2,583 (A)

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

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

= 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	*Rate*	*Amount*	*Qty.*		*Rate*	*Amount*
	Units	*Rs.*	*Rs.*	*Units*	*Rs.*		*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

$$= 1{,}26{,}000 \text{ units}\left(\frac{\text{Rs. } 1{,}76{,}000}{1{,}25{,}000 \text{ units}} - \frac{\text{Rs. } 1{,}80{,}000}{1{,}26{,}000 \text{ units}}\right) = \text{Rs. } 2{,}592 \text{ (A)}$$

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

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

= 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)

Ans. 50

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

(Refer to working note 3)

$$= \frac{160 \text{ lakhs}}{\left(\frac{\text{Rs. 240 lakhs}}{\text{Rs. 1200 lakhs}}\right)\times 100} = \text{Rs. 800 lakhs}$$

Break-even sales (Year 2)

(Refer to working note 3) $$= \frac{300 \text{ lakhs}}{\left(\frac{\text{Rs. 480 lakhs}}{\text{Rs. 1540 lakhs}}\right)\times 100} = \text{Rs. 962.50 lakhs}$$

(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%

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) $= \frac{\text{Direct wages and variable overhead}}{\text{Sales}} \times 100$

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

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	Total Variance
	(a)	(b)	(c)	d = (c) – (b)
Sales : (A)	1,200	1,400	1,540	140 (Fav.)
		(*Refer to working note 1*)		
Variable costs :				
Direct material (*Refer to working note 2*)	600	700	648	52 (Fav.)
Direct wages and variable overhead (*Refer to working note 2*)	360	420	412	8 (Fav.)
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)
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.)
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*	*Amount*	*Labour hours*	*Rate per hour*	*Amount*

	Rs.	Rs.		Rs.	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.)

Ans. 51: Basic Calculations

Equivalent Production in Units

Particulars	Direct Material		Labour & Overhead	
Units completed	100 %	6,000	100 %	6,000
Work-in-progress	100 %	600	50 %	300
Total Equivalent Units		6,600		6,300

(a) Direct Material Variances

Material		Standard output 6,600 units			Actual output 6,600 units	
	Qty.	Rate (Rs.)	Amount (Rs.)	Qty. (kg)	Rate (Rs.)	Amount (Rs.)
A	13,200	3	39,600	14,850	2.90*	43,065
B	6,600	4	26,400	7,260	4.098*	29,750
	19,800		66,000	22,110		72,815

*(Actual Cost/ Actual Quantity)

DMCV = Standard Cost for actual output – Actual Cost

= 66,000 – 72, 815 = Rs. 6,815 (A)

DMPV = Actual Qty. (Std, Rate – Actual Rate)

A = 14,850 (3 – 2.90) = 1,485 (F)

B = 7,260 (4 - 4.098) = 710 (A)

775 (F)

DMUV = Std. Rate (Std. Qty. for actual output – Actual Qty.)

A = 3 (13,200 – 14,850) = 4,950 (A)

B = 4 (6,600 – 7,260) = 2,640 (A)

7,590 (A)

DMMV = Std. Rate (Revised Std. Qty. – Actual Qty.)

A = 3

= 3 (14,740 – 14,850) = 330 (A)

B = 4

= 4 (7,370 – 7,260) = 440 (F)

110 (F)

DMYV = Std. Cost per Unit (Std. output for actual mix – Actual output)

= 66,000

= 10 (7,370 -6,600) = Rs. 7,700 (A)

(b) Direct Labour Variances

DLCV = Std. Cost for Actual Output – Actual Cost

= (6,300 X 20) – 1,27,500 = Rs. 1,500 (A)

DLRV = Actual Time (Std. Rate – Actual Rate)

	=	32,000 [	= Rs. 500 (F)

ITV	=	Std. Rate X Idle Hours
	=	4 X 200 = Rs. 800 (A)

DLEV	=	Std. Rate (Std. Time for actual production – Actual time worked)	
	=	4 [(6,300 X5) – 31,800]	
	=	4 (31,500 – 31,800)	= Rs. 1,200 (A)

(c) Variable Overhead Variances

VOC	=	Recovered Overheads – Actual Overheads	
	=	6,300 X 5 – 30,000	
	=	31,500 – 30,000	= Rs. 1,500 (A)

VOEXPV	=	Std. Variable Overheads – Actual Variable Overheads.	
	=	(31,800 X 1) – 30,000	
	=	31,800 – 30,000	= Rs. 1,800 (F)
VOEEFV	=	Recovered Overheads – Standard Overheads	
	=	1 X (31,500 -31,800)	= Rs. 300 (A)

(d) Fixed Overhead Variances

FOCV	=	Recovered Fixed Overheads – Actual Fixed Overheads	
	=	(6,300 X 10) – 80,600	
	=	63,000 – 80,600	= Rs. 17,600 (A)

FOEXPV	=	Budgeted Fixed Overheads – Actual Fixed Overheads	
	=	(8,000 X 10) – 80,600	= Rs. 600 (A)

FOVV	=	Recovered Fixed Overhead – Budgeted Fixed Overhead	
	=	63,000 – 80,000	= Rs. 17,000 (A)

Fixed Overhead Volume Variances may be segregated into the following:

FOEFFV	=	Std. Rate (Std. time for actual production – Actual time booked)	
	=	2 (31,500 – 31,800)	= Rs. 600 (A)

FOITV	=	Std. Rate per hour X Idle hours	
	=	2 X 200	= Rs. 400 (A)
FOCAPV	=	Std. Rate per hour (Actual time – Budgeted time)	
	=	2 (32,000 – 40,000)	= Rs. 16,000 (A)

(e) Sales Variances

SPV	=	Actual Qty. (Std. Price – Actual Price)	
	=	6,000	= Rs. 5,000 (F)

Sales Volume Variance (Contribution loss) :

	=	Std. Rate of profit (Budgeted Qty. – Actual Qty.)	
	=	5 (8,000 – 6,000)	= Rs. 10,000 (A)

Operating Statement showing the Reconciliation between Budgeted and Actual Profit for the Month

(Rs.)

Budgeted Profit (8,000 X Rs. 5)	Rs. Price	40,000

Sales Variances	5,000 (F)	
Volume	10,000 (A)	
Total	5,000 (A)	5,000 (A)
Cost Variances:		
Direct Materials		
Price	775 (F)	
Yield	7,700 (A)	
Mix	110 (F)	
Direct Wages		
Rate	500 (F)	
Efficiency	1,200 (A)	
Idle Time	800 (A)	
Variable Overheads		
Expense	1,800 (F)	
Efficiency	300 (A)	
Fixed Overheads		
Expense	600 (A)	
Efficiency	600 (A)	
Idle Time	400 (A)	
Capacity	16,000 (A)	
Total Cost Variances	24,415 (A)	24,415 (A)
Actual Profit		10,585

Ans:52: Computation of Variances

(a) Material Price variance

Material (1)	Qty. Purchase Kg. (2)	Std. Price Rs. (3)	Actual Price Rs.(4)	Std. cost Rs. (2x3)=5	Actual Cost Rs. (2x4)=(6)	Price Variance Rs. (5-6)=(7)
A	9,000	10.00	10.25	90,000	92,250	2,250 (A)
B	5,000	3.00	2.75	15,000	13,750	1,250 (F)
				1,05,000	1,06,000	1,000 (A)

(b) Material Usage Variance

Material (1)	Std. Qty. for actual output (2)	Actual Qty. (3)	Std. Price (4)	Std. Cost of Std. Qty. (2x4)=5	Std. Cost of Actual (4x5)=6	Usage Variance (5-6)=(7)
A	8,000	7,800	10	80,000	78,000	2,000 (F)
B	4,000	4,300	3	12,000	12,900	900 (A)
				92,000	90,900	1,100 (F)

(C) Labour Rate Variance

Actual Hours (1)	Std. Rate (2) Rs.	Actual Rate (3) Rs.	Std. Wage (4)=(1x2) Rs.	Actual Wages (5)=(1x3) Rs.	Rate Variance (6)=(4-5) Rs.
4200	3	2,875	12,600	12,075	525 (F)

(d) Labour Efficiency Variance

Std. Hours for actual output (1)	Actual Hours (2)	Std. Rate (3) Rs.	Std. Cost of Std. Hours (4)=(1x3) Rs.	Std. Cost. Of Actual Hours (5)=(2x3) Rs.	Efficiency Variance (6)=(5-6) Rs.
4,000	4,200	3	12,000	12,600	600 (A)

Overhead Variances

Basic calculations

(a) Budgeted overheads for November = 10,800 X 25 =Rs.22,500

(b) Std. hours produced for November = 800 units X 5 hrs per unit=4,000
(c) Fixed production overheads per hour = 25/5=5
(d) Recovered overhead = 4,000 X 5 =Rs.20,000
(e) Actual overheads = Rs.23,500
(f) Standard overheads = 4,200 X 5 =Rs.21,000

Variances
Overhead Cost variance
=Recovered Overheads- Actual Overheads
=20,000-23,5000 =Rs.3,500 (A)
Overhead Expenditure Variance
=Budgeted Overheads-Actual overheads
=22,500-23,500 =Rs.1,000 (A)
Overheads Volume variance
=Recovered Overheads-Budgeted Overheads
=20,000-22,500 =Rs.2,500 (A)
Overhead Volume Variance may be segregated into:
(a) Overhead Capacity Variance
=(Std. Overhead rate per hour) X (Actual hours-Budgeted hours)
= Standard Overheads-Budgeted Overheads
=21,000-22,500 =Rs.1,500 (A)
(b) Overhead Revised Capacity variance
= (Std. rate per hour) X (Std. hrs. produced – Actual hours)

Or

= Recovered overheads- Std. overheads
=20,000-21,000 =Rs.1,000 (A)

(ii) Operating Statement **(Rs.)**

(a)	Sales	(800 X Rs.200)	1,60,000	
	Less: std. Cost of Sales	(800 X Rs.155)	1,24,000	
	Standard profit			36,000
(b)	Variances	Favourable	Adverse	
	Materials			
	Price	-	1,000	
	Usage	1,100	-	
	Direct Labour			
	Rate	525	-	
	Efficiency	-	600	
	Fixed Overheads			
	Expenditure	-	1,000	
	Capacity 1,500 (A)			
	Efficiency 1,000 (A)	-	2,500	
		1,625	5,100	3,475 (A)
(c)	Actual Profit			32,525

(iii) In the solution given the price variance has been calculated at the point of purchase. In case it is calculated at the point of issue the variance will be as follows:

		(Rs.)
A	7,800 X (10-10.25)	1,950 (A)
B	4,300 X (3-2.75)	1,075 (F)
		875 (A)
Present variance		1,000 (A)
Hence difference		125
Actual profit as in (ii) above		32,525
Price variance difference		125
Actual profit as per question		

	32,650

Ans: 53:

Statement showing the computation of standard cost per unit **(Rs.)**

Particulars	Actual 960 units	Variance (-) Adv. (+) Fav.	Standard 960 units	Standard cost per unit
Direct Material	792	(-)24	768	0.80
Direct Wages	1,192	(-) 40	1,152	1.20
Variable overhead	1,940	(-) 20	1,920	2.00
Fixed overhead	1,040	(-) 40	1,000	1.04
Total Cost	4,964	(-)124	4,840	5.04
Profit	976	(+)56	920	0.96
	5,940	(+)180	5,760	6.00

Balancing figure

Original Budget and Flexible budget for sales achieved **(Rs.)**

Particulars	Standard Cost (per unit)	Original budget (1,000 units)	Flexible budget (960 units)
Direct Material	0.80	800	768
Direct Wages	1.20	1,200	1,152
Variable overhead	2.00	2,000	1,920
Fixed overhead	1.04	1,040	1,040
Cost of Sales	5.04	5,040	4,880
Profit	0.96	960	880
Sales	6.00	6,000	5,760

Ans: 54:

(i) Flexible budget for May 2004

Units		Original Budget 20,000	Flexible Budget for May 2004 18,000	Actuals may 2004 18,000	Variance
1		2	3	4	5
Sales Variable costs		24,00,000	21,60,000	22,00,000	40,000 F
Direct Materials		6,00,000	5,40,000	5,20,000	20,000 F
Direct Labour		8,00,000	7,20,000	7,56,000	36,000 A
Factory Overheads		2,00,000	1,80,000	1,84,000	4,000 A
Selling overheads		3,00,000	2,70,000	2,88,000	18,000 A
Total		19,00,000	17,10,000	17,48,000	38,000 A
Contribution	(A)	5,00,000	4,50,000	4,52,000	2,000 F
Fixed Cost					
Factory overheads		1,00,000	1,00,000	1,16,000	16,000 A
Selling overheads		2,00,000	2,00,000	1,84,000	16,000 F
Total	(B)	3,00,000	3,00,000	3,00,000	-
Profit	(A-B)	2,00,000	1,50,000	1,52,000	2,000 F
Volume variance		2,00,000	-		50,000 A
Net Loss		-1,50,000			(48,000)

(ii) Variance Analysis

(1)	**Sales Std. Price**	=Rs.24 lakhs /20,000	=Rs.120
	Std. profit	=Rs.2 lakhs / 20,000	=Rs.10
	Actual quantity	=18,000 and standard price	=Rs.120
	Turnover on Std. Price	=18,000 X 120	=Rs.21,60,000
	Actual turnover is given at Rs.22 lakhs.		
	: Price Variance	=40,000 (F)	
	Std. Qty X Std. Profit	=20,000 X 10	=Rs.2 lakhs

	Actual Qty .X Std. Profit	=18000 X 10	=Rs.180 lakhs
	Quantity Variance	=Rs.20,000 A	
(2)	**Direct Materials**		
	Std. Cost	=Rs.6,00,000/20,000	=Rs.30
	Actual Qty.=18,000 AQ X SC	=18,000 X 30	=Rs.5,40,000
	Total Actual Cost		=Rs.5,20,000
	Material Price Variance		=Rs.20,000 (F)
(3)	**Direct Wages**		
	Std. Time per unit	=1,00,000/20,000	=5 hours
	Std. hourly rate	=8,00,000/1,00,000	=Rs.8/hr.
	Std. Hours produced	=18,000 units X 5 hrs.	=90,000 hrs.
	Std. Hours=90,000	Actual Hours=95,000	Std. Rate Rs.8
	(a) Std. Hrs. X Std. rate	=90,000 X 8.	=Rs.7,20,000
	(b) Actual Hrs. X Actual Rate	=Rs.7,56,000	
	© Actual Hrs. X Std. Rate	=95,000 X 8	=Rs.7,60,000
	Efficiency variance	=(a)-(c)=Rs.40,000 (A)	
	Rate Variance	=(c) –(b)=Rs.4,000 (F)	
(4)	**Factory Variable overheads**:		
	Std. Rate	=Rs.2,00,000/1,00,000	=Rs.2/hr.
	(a) Charged to production	=90,000 X2	=Rs.1,80,000
	(b) Std. cost of actual hours	=95,000 X 2	=Rs.1,90,000
	(c) Actual overheads		=Rs.1,84,000
	(a) – (b)	=Rs.10,000 (A)	Being efficiency variance
	(b) – (c)	=Rs.6,000 (F)	Being expense variance
(5)	**Selling variable overheads**:		
	Std. Rate	=Rs.3,00,000/20,000	=Rs.15 / unit
	(a) Std. cost of output	=18,000 X 15	=Rs.2,70,00
	(b) Actual overheads		=2,88,000
	Adverse Variance		=18,000
(6)	**Factory overheads- Fixed**:		
	Std. Rate = Rs.1,00,000/1,00,000		=Re.1/hr.
	(a) Std. cost of output of 90,000		=Rs.90,000
	(b) Std. cost of actual hours. (95,000)		=Rs.95,000
	(c) Budgeted		=Rs.1,00,000
	(d) actual		
	Efficiency variance : (a) – (b)	=Rs.5,000 (A)	
	Capacity variance : (b) – (c)	=Rs.5,000 (A)	
	Expenses variance : (c)- (d)	=Rs.16,000 (A)	
(7)	**Selling overheads : Fixed**:		
	Standard	=Rs.2 lakhs / 20,000	=Rs.10 per unit
	(a) Std. cost of output	=18,000 x 10	=Rs.1,80,000
	(b) Budget		=Rs.2,00,000
	(c)Actual		=Rs.1,84,000
	Volume variance	= (a) – (b)	=Rs.20,000 (A)
	Expense variance	= (b)-(c)	=Rs.16,000 (F)

<u>Ans: 55:</u>Working Notes:

1. sales Variances

(1) Sales Volume Margin Variance
(Actual Sales Volume – Budgeted Volume) x Standard Margin
=(22,000 units – 20,000 units) x Re.1 =Rs.2,000 (F)

(2) Sales Margin Price Variance
Actual Sales Volume x (Actual Selling Price – Budgeted Selling Price)
=(14,000 units (Rs.5 – Rs.5) + (8,000 units x (Rs.4.75 – Rs.5) =Rs.2,000 (A)

2. Material Variances

(1) Material Price Variance
(Std. Price – Actual Price) x Actual Quantity
A : (0.30 – 0.20) x 16,000 kg. =Rs.1,600 (F)

B : (0.70 – 0.80) x 10,000 kg. =Rs.1,000 (A) =Rs.600 (F)

(2) Material Mix Variance
Total Actual Quantity (S.C. of Std. mix per kg. – S.C. of actual mix per kg.)

$$=26000kg\left[\frac{Rs.10000}{20000kg}-\frac{Rs.11800}{26000kg}\right]$$

=Rs.1,200 (F)

(3) Material Yield Variance
Std. rate per kg. of output (Actual Yield – Std. Yield)
= 0.50 (24,000 kg. – 26,000 kg.) =Rs.1,000 (A)

(3) Labour Variance

(1) Labour Rate Variance
(Std. rate p.h. – Actual rate p.h.) x Actual hours
Skilled Labour : (Rs.3 – Rs.2.95) x 13,000 hrs. =Rs.650(F)
Unskilled Labour : (Rs.2.50 – Rs.2.60) x 6,300 hrs. =Rs.630(A) =Rs.20(F)

(2) Labour Efficiency Variance
(Std. hrs. for Actual output – Actual hours) x Std. rate p.h.
Skilled Labour : (Rs.10,800 hrs-12,000 hrs.) x Rs.3 =Rs.3,600 (A)
Unskilled Labour : (6,240 hrs. – 6,300 hrs.) x Rs.2.50 =Rs.150 (A) =Rs.3,750 (A)

(3) Idle Time Variance
(Idle hours x Standard Wage rate p.h)
Skilled Labour : 1,000 hours x Rs.3 =Rs.3,000 (A)

(4) Variable Overhead Variance

(1) Variable Overhead Expenditure Variance
(Variable Overhead recovered on actual output – Actual Variable Overhead)
= (24,000 units x Re.0.50) – Rs.15,000 =Rs.3,000 (A)

(5) Fixed Overhead Variances

(1) Fixed Overhead Expenditure Variance
(Budgeted Expenditure – Actual Expenditure)
= (Rs.20,000 – Rs.18,020) =Rs.1,980 (F)

(2) Fixed Overhead Volume Variance
(Budgeted Volume – Actual Volume) x Std. rate per unit
= (20,000 units – 24,000 units) x Re.1 =Rs.4,000 (F)

Statement reconciling Actual Profit and Budgeted Profit

Particulars	Reference to working note	Variance		Actual
		Favourable	Adverse	
Budgeted profit	-			20,000
(as per Budgeted income statement)				
1.Sales Variances				
Sales Volume Margin Variance	(1)	2,000		
Sales Volume Margin Variance	(2)	-	2,000	
Profit before adjustment of Cost Variances				20,000
II Material - Price	(1)	600	-	
- Mix	(2)	1,200	-	
- Yield	(3)	-	1,000	
III. Labour Variance				
- Rate	(1)	20	-	
-Efficiency	(2)	-	3,750	
-Idle time	(3)	-	3,000	
IV. V. Overheads -Expenditure	(1)	-	3,000	
V. F. Overheads -Expenditure	(1)	1,980	-	
-Volume	(2)	4,000	-	
		7,800	10,750	2,950

Actual Profit				17,050

Ans. 56: (1) Statement showing the amount of sales target fixed and the actual amount of contribution earned.

(Rs.'000)

Zonal Sales Officers	*A*	*B*	*C*	*D*
Commission earned	29.9	23.5	24.5	25.8
Actual sales:				
(Commission earned / 5%)	598	470	490	516
Sales price variance	4 (F)	6 (A)	5 (A)	2 (A)
Sales volume variance	6 (A)	26 (F)	15 (F)	8 (F)
Sales target / Budgeted sales	600	450	480	510
Standard cost of sales target	500	375	400	425
Standard margin/ Budgeted margin	100	75	80	85
Sales margin mix variance	14 (A)	8 (F)	17 (F)	3 (A)
Sales price variance	4 (F)	6 (A)	5 (A)	2 (A)
Actual margin	90	77	92	80

Note: As there is no information about sales margin quantity variances, therefore for calculating actual contribution the same has been assumed to be zero.

(2) Statement to evaluate the performance of zonal sales officers

		Zonal Sales Officers			
S. No.	*Base factor to evaluate performance*	*A*	*B*	*C*	*D*
	Efficiency towards the target sales:				
1.	(a) Whether target achieved	No	Yes	Yes	Yes
	(b) Actual sales to Target sales ratio (Actual / target) (%)	99.67 $\left(\frac{598\times100}{600}\right)$	104.44 $\left(\frac{470\times100}{450}\right)$	102.98 $\left(\frac{490\times100}{480}\right)$	101.18 $\left(\frac{516\times100}{510}\right)$
	(c) Ranking	IV	I	II	III
2.	(a) Contribution earned (in Rs.'000)	90	77	92	80
	(b) Ranking	II	IV	I	III
3..	(a) Standard margin/ sales target ratio	16.67	16.67	16.67	16.67
	(b) Actual margin / Actual sales ratio (%)	15.05	16.38	18.78	15.50
	(c) Ranking	IV	II	I	III

Recommendation:

A review of performance of four officers based on three based factors, shows that the performance of officer C is the best.