Alternatively

$$DMYV = \left(\frac{\text{Standard Cost}}{\text{Per Unit}}\right)\left(\begin{matrix}\text{Actual} \\ \text{Output}\end{matrix} - \begin{matrix}\text{Expected Output in} \\ \text{Actual Input}\end{matrix}\right)$$

$$= \left(\frac{Rs.450}{90\ units}\right)\left(90\ units - \frac{2,440\ units}{24\ units\ of\ input\ for\ 1\ unit\ of\ output}\right)$$

$$= (Rs.5)\ (90\ units - 101.67\ units)$$

$$= Rs.58.35(A)$$

Note: Following input is used as per standard for producing 10 units: -

X	=	60 units
Y	=	80 units
Z	=	100 units

Hence, in order to produce 1 unit of output, following input is required: –

X	=	60/10	=	6 units
Y	=	80/10	=	8 units
Z	=	100/10	=	10 units
				24 units

Ans. to Q.2

	SP × SQAO	SP × RSQ	SP × AQ	AP × AQ
	M₁	**M₂**	**M₃**	**M₄**
A	200 × 1,000	200 × 1,010.50	200 × 1,010	210 × 1,010
	= 2,00,000	= 2,02,100	= 2,02,000	= ₹ 2,12,100
B	50 × 4,000	50 × 4,042	50 × 4,200	49 × 4,200
	= 2,00,000	= 2,02,100	= 2,10,000	= 2,05,800
C	20 × 5,000	20 × 5,052.50	20 × 4,800	21 × 4,800
	= 1,00,000	= 1,01,050	= 96,000	= 1,00,800
D	7 × 10,000	7 × 10,105	7 × 10,200	6.5 × 10,200
	= 70,000	= 70,735	= 71,400	= 66,300
	5,70,000			

DMCV		$M_1 - M_4$		
A	=	2,00,000 – 2,12,100	=	₹ 12,100 (A)
B	=	2,00,000 – 2,05,800	=	₹ 5,800 (A)
C	=	1,00,000 – 1,00,800	=	₹ 800 (A)
D	=	70,000 – 66,300	=	₹ 3,700 (F)
				₹ 15,000 (A)

DMPV		$M_3 - M_4$		
A	=	2,02,000 – 2,12,100	=	₹ 10,100 (A)
B	=	2,10,000 – 2,05,800	=	₹ 4,200 (F)
C	=	96,000 – 1,00,800	=	₹ 4,800 (A)
D	=	71,400 – 66,300	=	₹ 5,100 (F)
				₹ 5,600 (A)

DMUV	=	$M_1 - M_3$	=	₹ 2,000 (A)
A	=	2,00,000 – 2,02,000	=	₹ 10,000 (A)
B	=	2,00,000 – 2,10,800	=	₹ 4,000 (F)
C	=	1,00,000 – 96,000	=	₹ 1,400 (A)
D	=	70,000 – 71,400		₹ 9,400 (A)

DMMV	=	$M_2 - M_3$	=	₹ 100 (F)
A	=	2,02,100 – 2,02,000	=	₹ 7,900 (A)
B	=	2,02,100 – 2,10,000	=	₹ 5,050 (F)
C	=	1,01,050 – 96,000	=	₹ 665 (A)
D	=	70,735 – 71,400		₹ 3,415 (A)

DMYV	=	$M_1 - M_2$	=	₹ 2,100 (A)
A	=	2,00,000 – 2,02,100	=	₹ 2,100 (A)
B	=	2,00,000 – 2,02,100	=	₹ 1,050 (A)
C	=	1,00,000 – 1,01,050	=	₹ 735 (A)
D	=	70,000 – 70,735		₹ 5,985 (A)

Alternatively,

$$DMYV = \text{(Standard Cost per unit)} \left(\text{Actual Output} - \frac{\text{Expected Output}}{\text{in Actual Input}} \right)$$

$$= \left(\frac{₹ 5,70,000}{19,000 \text{ units}} \right) \left(19,000 \text{ units} - \frac{20,210 \text{ kgs.}}{\left(\frac{100}{95} \right)} \right)$$

$$= (₹ 30/ \text{ unit}) (19,000 \text{ units} - 19199.50 \text{ units})$$

$$= ₹ 5,985 \text{ (A)}$$

Ans. to Q.3

	SP × SQAO	SP × RSQ	SP × AQ	AP × AQ
	M_1	M_2	M_3	M_4
A	2,500 × 114	2,500 × 120	2,500 × 115	2,300 × 115
	= 2,85,000	= 3,00,000	= 2,87,500	= 2,64,500
B	3,500 × 76	3,500 × 80	3,500 × 85	3,600 × 85
	= 2,66,000	= 2,80,000	= 2,97,500	= 3,06,000
	5,51,000			

DMCV	=	$M_1 - M_4$		
A	=	2,85,000 – 2,64,500	=	₹ 20,500 (F)
B	=	2,66,000 – 3,06,000	=	₹ 40,000 (A)
				₹ 19,500 (F)

DMPV	=	$M_3 - M_4$		
A	=	2,87,500 – 2,64,500	=	₹ 23,000 (F)
B	=	2,97,500 – 3,06,000	=	₹ 8,500 (A)
				₹ 14,500 (F)

DMUV	=	$M_1 - M_3$		
A	=	2,85,000 – 2,87,500	=	₹ 2,500 (A)
B	=	2,66,000 – 2,97,500	=	₹ 31,500 (A)
				₹ 34,000 (A)

DMMV	=	$M_2 - M_3$		

$$
\begin{aligned}
A &= 3,00,000 - 2,87,500 &&= &&₹\ 12,500\ (F) \\
B &= 2,80,000 - 2,97,500 &&= &&₹\ 17,500\ (A) \\
&&&&&₹\ 5,000\ (A)
\end{aligned}
$$

$$
\begin{aligned}
DMYV &= && M_1 - M_2 \\
A &= 2,85,000 - 3,00,000 &&= &&₹\ 15,000\ (A) \\
B &= 2,66,000 - 2,80,000 &&= &&₹\ 14,000\ (A) \\
&&&&&₹\ 29,000\ (A)
\end{aligned}
$$

Alternatively,

$$
DMYV = (\text{Standard cost per unit})\left(\begin{array}{c}\text{Actual} \\ \text{Output}\end{array} - \begin{array}{c}\text{Expected Output} \\ \text{in Actual Input}\end{array}\right)
$$

$$
= \left(\frac{₹\ 5,51,000}{171\ \text{units}}\right)\left(171\ \text{units} - \frac{200\ \text{units}}{\left(\frac{100}{90}\right)}\right)
$$

$$
= ₹\ 29,000\ (A)
$$

Note–1 Revised Standard Quantity (RSQ)

Total of Actual Input   = 20 units

     Budgeted Ratio = 3:2

$$
A = 200 \times \frac{3}{5} = 120\,units; B = 200 \times \frac{2}{5} = 80\,units
$$

Note–2 Budgeted Input for one tonne of output

As per standard, in order to produce 90 tonnes of output, 60 tonnes of A and 40 tonnes of B is to be used. Hence, in order to produce 1 tonne of output, $\left(\frac{60}{90}\right)$ tonnes of A and

$\left(\frac{40}{90}\right)$ tonnes of B is to be used.

Note–3

SQAO = Actual Output × Budgeted input per tonne

$$
A = 171 \times \frac{60}{90} = 114\ tonnes
$$

$$
B = 171 \times \frac{40}{90} = 76\ tonnes
$$

Note 4 : Actual Output = Actual Input – Actual Loss = (115 + 85) tones – 29 = 171 tonnes

Ans. to Q.4

	SP × SQAO M₁	SP × RSQ M₂	SP × AQ M₃	AP × AQ M₄
A	400 × 164 = 65,600	400 × 160 = 64,000	400 × 180 = 72,000	360 × 180 = 64,800
B	600 × 246 = 1,47,600	600 × 240 = 1,44,000	600 × 220 = 1,32,000	680 × 220 = 1,49,600
	2,13,200			

<u>Revised Standard Quantity</u>

Total of Actual Input = 400 kgs

Budgeted Ratio = 40:60 = 2:3

$$A = 400 \times \frac{2}{5} = 600 \ kgs \ ; \ B = 400 \times \frac{3}{5} = 240 \ kgs.$$

<u>Standard Quantity to produce 1 unit of output</u>

Output	Input		Total
	A	B	100 kgs.
	40 kgs.	60 kgs.	
90 kgs.			
1 kg.	$\left(\frac{40}{90}\right) kgs.$	$\left(\frac{60}{90}\right) kgs.$	$\left(\frac{100}{90}\right) kgs.$

<u>SQAQ</u>

Actual Output × Budgeted input per unit of output

$$A = 369 \times \frac{40}{90} = 164 \ kgs$$

$$B = 369 \times \frac{60}{90} = 246 \ kgs$$

			$M_1 - M_4$			
DMCV	=					
	A	=	65,600 – 64,800	=	₹	800 (F)
	B	=	1,47,600 – 1,49,600	=	₹	2,000 (A)
					₹	1,200 (A)

			$M_3 - M_4$			
DMPV	=					
	A	=	72,000 – 64,800	=	₹	7,200 (F)
	B	=	1,32,000 – 1,49,600	=	₹	17,600 (A)
					₹	10,400 (A)

			$M_1 - M_3$			
DMUV	=					
	A	=	65,600 – 72,000	=	₹	6,400 (A)
	B	=	1,47,600 – 1,32,000	=	₹	15,600 (F)
					₹	9,200 (F)

			$M_2 - M_3$			
DMMV	=					
	A	=	64,000 – 72,000	=	₹	8,000 (A)
	B	=	1,44,000 – 1,32,000	=	₹	12,000 (F)
					₹	4,000 (F)

			$M_1 - M_2$			
DMYV	=					
	A	=	65,600 – 64,000	=	₹	1,600 (F)
	B	=	1,47,600 – 1,44,000	=	₹	3,600 (F)
					₹	5,200 (F)

Alternatively,

$$DMYV = (\text{Standard cost per unit}) \left(\begin{array}{c} \text{Actual} \\ \text{Output} \end{array} - \begin{array}{c} \text{Expected Output} \\ \text{in Actual Input} \end{array} \right)$$

$$= \left(\frac{₹2,13,200}{369 \ kgs.} \right) \left(369 \ kgs. - \frac{400 \ kgs.}{\left(100/90 \right)} \right)$$

$$= ₹ \ 5,200 \ (F)$$

Ans. to Q.5

	SP × SQAO M₁	SP × RSQ M₂	SP × AQ M₃	AP × AQ M₄
A	$7 \times 51,500$ $= 3,60,500$	$7 \times 50,000$ $= 3,50,000$	$7 \times 53,000$ $= 3,71,000$	$7 \times 53,000$ $= 3,71,000$
B	$5 \times 30,900$ $= 1,54,500$	$5 \times 30,000$ $= 1,50,000$	$5 \times 28,000$ $= 1,40,000$	$5.30 \times 28,000$ $= 1,48,400$
C	$2 \times 20,600$ $= 41,200$	$2 \times 20,000$ $= 40,000$	$2 \times 19,000$ $= 38,000$	$2.20 \times 19,000$ $= 41,800$

Revised Standard Quantity (RSQ)

Total of Actual Input = 1,00,000 tonnes
Budgeted Ratio = 5:3:2

$$A = 1,00,000 \times \frac{5}{10} = 50,000 \ tonnes$$

$$B = 1,00,000 \times \frac{3}{10} = 30,000 \ tonnes$$

$$C = 1,00,000 \times \frac{2}{10} = 20,000 \ tonnes$$

Budgeted Input for one tonne of output

Output	Input (tonnes)			Total
	A	B	C	
9	5	3	2	10
1	$\frac{5}{9}$	$\frac{3}{9}$	$\frac{2}{9}$	$\frac{10}{9}$

SQAO = Actual Output × Budgeted input per unit of output

$$A = 92,700 \times \frac{5}{9} = 51,500 \ tonnes$$

$$B = 92,700 \times \frac{3}{9} = 30,900 \ tonnes$$

$$C = 92,700 \times \frac{2}{9} = 20,600 \ tonnes$$

DMCV	=	$M_1 - M_4$	=	₹ 10,500 (A)
A	=	3,60,500 − 3,71,000	=	₹ 6,100 (F)
B	=	1,54,500 − 1,48,400	=	₹ 600 (A)
C	=	41,200 − 41,800		₹ 5,000 (A)

DMPV	=	$M_3 - M_4$	=	Nil
A	=	3,71,000 − 3,71,000	=	₹ 8,400 (A)
B	=	1,40,000 − 1,48,400	=	₹ 3,800 (A)
C	=	38,200 − 41,800		₹ 12,200 (A)

DMUV	=	$M_1 - M_3$	=	₹ 10,500 (A)
A	=	3,60,500 − 3,71,000	=	₹ 14,500 (F)
B	=	1,54,500 − 1,40,000	=	₹ 3,200 (F)
C	=	41,200 − 38,000		₹ 7,200 (F)

$$\begin{aligned}
\text{DMPV} &= & M_2 - M_3 & & \\
A &= & 3,50,000 - 3,71,000 &= & ₹\ 21,000\ (A) \\
B &= & 1,50,000 - 1,40,000 &= & ₹\ 10,000\ (F) \\
C &= & 40,000 - 38,000 &= & ₹\ 2,000\ (F) \\
& & & & \underline{₹\ 9,000\ (A)}
\end{aligned}$$

$$\begin{aligned}
\text{DMYV} &= & M_1 - M_2 & & \\
A &= & 3,60,500 - 3,50,000 &= & ₹\ 10,500\ (F) \\
B &= & 1,54,500 - 1,50,000 &= & ₹\ 4,500\ (F) \\
C &= & 41,200 - 40,000 &= & ₹\ 1,200\ (F) \\
& & & & \underline{₹\ 16,200\ (F)}
\end{aligned}$$

Alternatively,

$$\text{DMYV} = (\text{Standard cost per unit})\left(\begin{array}{c}\text{Actual} \\ \text{Output}\end{array} - \begin{array}{c}\text{Expected Output} \\ \text{in Actual Input}\end{array}\right)$$

$$= \left(\frac{₹\ 5,56,200}{92,700}\right)\left(92,700\ \text{units} - \frac{1,00,000\ \text{tonnes}}{\left(\frac{10}{9}\right)}\right) = ₹\ 16,200\ (F)$$

Ans. to Q.6

	SP × SQAO	SP × RSQ	SP × AQ	AP × AQ
	M_1	M_2	M_3	M_4
A	2 × 81.6 = ₹ 163.2	2 × 80 = 160	2 × 70 = ₹ 140	2.10 × 70 = ₹ 147
B	5 × 40.8 = ₹ 204	5 × 40 = 200	5 × 50 = ₹ 250	4.50 × 50 = ₹ 225
	₹ 367.20			

$$\begin{aligned}
\text{DMCV} &= & M_1 - M_4 & & \\
A &= & 163.2 - 147 &= & ₹\ 16.2\ (F) \\
B &= & 204 - 225 &= & \underline{₹\ 21\ (A)} \\
& & & & ₹\ 4.8\ (A)
\end{aligned}$$

$$\begin{aligned}
\text{DMPV} &= & M_3 - M_4 & & \\
A &= & 140 - 147 &= & ₹\ 7\ (A) \\
B &= & 250 - 225 &= & \underline{₹\ 25\ (F)} \\
& & & & ₹\ 18\ (F)
\end{aligned}$$

$$\begin{aligned}
\text{DMUV} &= & M_1 - M_3 & & \\
A &= & 163.2 - 140 &= & ₹\ 23.2\ (F) \\
B &= & 204 - 250 &= & \underline{₹\ 46\ (A)} \\
& & & & ₹\ 22.8\ (A)
\end{aligned}$$

$$\begin{aligned}
\text{DMMV} &= & M_2 - M_3 & & \\
A &= & 160 - 140 &= & ₹\ 20\ (F) \\
B &= & 200 - 250 &= & \underline{₹\ 50\ (A)} \\
& & & & ₹\ 30\ (A)
\end{aligned}$$

$$\text{DMYV} = (\text{Standard cost per unit})\left(\begin{array}{c}\text{Actual} \\ \text{Output}\end{array} - \begin{array}{c}\text{Expected Output} \\ \text{in Actual Input}\end{array}\right)$$

$$= \left(\frac{₹\ 367.20}{102\ \text{kgs.}}\right)\left(102\ \text{kgs.} - \frac{120\ \text{kgs.}}{1.2}\right) = ₹\ 7.2\ (F)$$

Ans. to Q.7

SP × SQAO	SP × RSQ	SP × AQ	AP × AQ
M_1	M_2	M_3	M_4
A 20 × 123.75	20 × 120 =	20 × 105	20 × 105
= ₹ 2,475	₹ 2,400	= ₹ 2,100	= ₹ 2,100
B 10 × 82.5	10 × 80	10 × 95	9 × 95
= ₹ 825	= ₹ 800	= ₹ 950	= ₹ 855
₹ 3,300			

$$DMCV = M_1 - M_4$$

A = 2,475 − 2,100 = ₹ 375 (F)

B = 825 − 855 = ₹ 30 (A)

₹ 345 (F)

$$DMPV = M_3 - M_4$$

A = 2,100 − 2,100 = Nil

B = 950 − 855 = ₹ 95 (F)

₹ 95 (F)

$$DMUV = M_1 - M_3$$

A = 2,475 − 2,100 = ₹ 375 (F)

B = 825 − 855 = ₹ 125 (A)

₹ 250 (F)

$$DMMV = M_2 - M_3$$

A = 2,400 − 2,100 = ₹ 300 (F)

B = 800 − 950 = ₹ 150 (A)

₹ 150 (F)

$$DMYV = (\text{Standard cost per unit}) \left(\begin{matrix} \text{Actual} \\ \text{Output} \end{matrix} - \begin{matrix} \text{Expected Output} \\ \text{in Actual Input} \end{matrix} \right)$$

$$= \left(\frac{₹\,3,300}{165\ \text{kgs.}} \right) \left(165\ \text{kgs.} - \frac{200\ \text{kgs.}}{100\big/80} \right)$$

$$= ₹\ 100\ (F)$$

Ans. to Q.8

Material Cost Variance

SP × SQAO	SP × RSQ	SP × AQ	AP × AQ
M_1	M_2	M_3	M_4
₹ 4.20 × 25,600 lbs.	Nil	₹ 4.20 × 25,700 lbs	₹ 4.5 × 25,700 lbs.
= ₹ 1,07,520		= ₹ 1,07,940	= ₹ 1,15,650

SQAO = Actual Output × Budgeted input/ unit

= 5,120 pieces × 5 lbs. = 25,600 lbs.

DMCV = $M_1 - M_4$ = 1,07,520 − 1,15,650 = ₹ 8,130 (A)

DMPV = $M_3 - M_4$ = 1,07,940 − 1,15,650 = ₹ 7,710 (A)

DMUV = $M_1 - M_3$ = 1,07,520 − 1,07,940 = ₹ 420 (A)

Labour Cost Variances

SR × SHAO	SR × RSH	SR × AH	AR × AH
L_1	L_2	L_3	L_4
₹ 3 × 15,360 hrs.	Nil	₹ 3 × 15,150 hrs.	₹ 3.2 × 15,150 hrs.
= ₹ 46,080		= ₹ 45,450	= ₹ 48,480

SHAO = 5,120 pieces × 3 hrs. per piece = 15,360 hrs.

DLCV = $L_1 - L_4$ = 46,080 − 48,480 = ₹ 2,400 (A)

DLRV = $L_3 - L_4$ = 45,450 − 48,480 = ₹ 3,030 (A)

DLEV = $L_1 - L_3$ = 46,080 − 45,450 = ₹ 630 (F)

Ans. to Q.9

SR × SHAO	SR × RSH	SR × AH	AR × AH
L_1	L_2	L_3	L_4
₹ 2 × 6,000 hrs.	Nil	₹ 2 × 9,000 hrs.	₹ 20,000
= ₹ 12,000		= ₹ 18,000	

SHAO = Actual Output × Budgeted hrs./ unit

= 4,000 units × 1.5 hrs./ unit

= 6,000 hrs.

DLCV = $L_1 - L_4$ = 12,000 − 20,000 = ₹ 8,000 (A)

DLRV = $L_3 - L_4$ = 18,000 − 20,000 = ₹ 2,000 (A)

DLEV = $L_1 - L_3$ = 12,000 − 18,000 = ₹ 6,000 (A)

Ans. to Q.10

	SR × SHAO	SR × RSH	SR × AH	AR × AH
	L_1	L_2	L_3	L_4
Skilled	60 × 3,000 = 1,80,000	60 × 3,200 = 1,92,000	60 × 2,560 = 1,53,600	65 × 2,560 = 1,66,400
Semi-skilled	36 × 1,200 = 43,200	36 × 1,280 = 46,080	36 × 1,600 = 57,600	40 × 1,600 = 64,000
Un-skilled	24 × 1,800 = 43,200	24 × 1,920 = 46,080	24 × 2,240 = 53,760	20 × 2,240 = 44,800

DLCV	=	$L_1 - L_4$		
Skilled	=	1,80,000 − 1,66,400	=	₹ 13,600 (F)
Semi-skilled	=	43,200 − 64,000	=	₹ 20,800 (A)
Unskilled	=	43,200 − 44,800	=	₹ 1,600 (A)
				₹ 8,800 (A)

DLRV	=	$L_3 - L_4$		
Skilled	=	1,53,600 − 1,66,400	=	₹ 12,800 (A)
Semi-skilled	=	57,600 − 64,000	=	₹ 6,400 (A)
Unskilled	=	53,760 − 44,800	=	₹ 8,960 (F)
				₹ 10,240 (A)

DLEV	=	$L_1 - L_3$		
Skilled	=	1,80,000 − 1,53,600	=	₹ 26,400 (F)
Semi-skilled	=	43,200 − 57,600	=	₹ 14,400 (A)
Unskilled	=	43,200 − 53,760	=	₹ 10,560 (A)
				₹ 1,440 (F)

DLMV	=			
Skilled	=	$L_2 - L_3$		
Semi-skilled	=	$1,92,000 - 1,53,600$	=	₹ 38,400 (F)
Unskilled	=	$46,080 - 57,600$	=	₹ 11,520 (A)
		$46,080 - 53,760$	=	₹ 7,680 (A)
				₹ 19,200 (F)
DLYV	=			
Skilled	=	$L_1 - L_2$		
Semi-skilled	=	$1,80,000 - 1,92,000$	=	₹ 12,000 (A)
Unskilled	=	$43,200 - 46,080$	=	₹ 2,880 (A)
		$43,200 - 46,080$	=	₹ 2,880 (A)
				₹ 17,760 (A)

Ans. to Q.11

Output Absorbed VO	Input Absorbed VO	Actual VO
VO_1	VO_2	VO_3
₹ 9,000	₹ 8,750	₹ 9,150

Output Absorbed VO = Actual Output × Budgeted VO/ Unit

$$= 360 \text{ units} \times \frac{₹10,000}{400 \text{ units}} = ₹9,000$$

Input Absorbed VO = Actual Hours × Budgeted VO/hr.

$$= 7,000 \text{hrs.} \times \frac{₹10,000}{8,000 \text{hrs.}} = ₹8,750$$

VO Cost Variance = $VO_1 - VO_3 = 9,000 - 9,150 = ₹ 150$ (A)

VO Expenditure Variance = $VO_2 - VO_3 = 8,750 - 9,150 = ₹ 400$ (A)

VO Efficiency Variance = $VO_1 - VO_2 = 9,000 - 8,750 = ₹ 250$ (F)

Ans. to Q.12

Output Absorbed FO	Input Absorbed FO	Budgeted FO	Actual FO
FO_1	FO_2	FO_3	FO_4
₹ 63,000	₹ 60,000	₹ 70,000	₹ 72,000

Output Absorbed FO = Standard hrs. for Actual Output × Budgeted FO/ hour

= 21,000 hrs. × ₹ 3/ hr.

= ₹ 63,000

Input Absorbed FO = Actual hrs. × Budgeted FO/ hrs.

= 20,000 hrs. × ₹ 3/ hr.

= ₹ 60,000

FO Cost Variance = $FO_1 - FO_4 = 63,000 - 72,000 = ₹ 9,000$ (A)

FO Budget Variance = $FO_3 - FO_4 = 70,000 - 72,000 = ₹ 2,000$ (A)

FO Volume Variance = $FO_1 - FO_3 = 63,000 - 70,000 = ₹ 7,000$ (A)

FO Efficiency Variance = $FO_1 - FO_2 = 63,000 - 60,000 = ₹ 3,000$ (F)

FO Capacity Variance = $FO_2 - FO_3 = 60,000 - 70,000 = ₹ 10,000$ (A)

Ans. to Q.13

Output Absorbed FO	Input Absorbed FO	Budgeted FO	Actual FO
FO_1	FO_2	FO_3	FO_4
₹ 5,250	₹ 5,500	₹ 5,000	₹ 6,000

Output Absorbed FO = Actual Output × Budgeted FO/ Unit

$$= 1,050 \text{ units} \times \frac{Rs.\ 5,000}{1,000\ units}$$

= ₹ 5,250

Input Absorbed FO = Actual Hours × Budgeted FO/ hour

$$= 11,000 \text{ hours} \times \frac{₹\ 5,000}{(1,000 \times 10)\ hours}$$

= ₹ 5,500

FO Cost Variance	$= FO_1 - FO_4 = ₹ 750$ (A)
FO Expenditure Variance	$= FO_3 - FO_4 = 5,000 - 6,000 = ₹ 1,000$ (A)
FO Volume Variance	$= FO_1 - FO_3 = 5,250 - 5,000 = ₹ 250$ (F)
FO Capacity Variance	$= FO_2 - FO_3 = 5,500 - 5,000 = ₹ 500$ (F)
FO Efficiency Variance	$= FO_1 - FO_2 = 5,250 = 5,500 = ₹ 250$ (A)

Ans. to Q.14

Output Absorbed FO	Input Absorbed FO	Possible FO	Budgeted FO	Actual FO
FO_1	FO_2	FO_3	FO_4	FO_5
₹ 1,27,320	₹ 1,20,960	₹ 1,38,240	₹ 1,44,000	₹ 1,42,000

Output Absorbed FO = Actual Output × Budgeted FO/ Unit

$$= 5,305 \text{ units} \times \frac{₹ 1,44,000}{6,000\ units} = ₹1,27,320$$

Budgeted Output $= \dfrac{120 \text{ machines} \times 25 \text{ days} \times 8 \text{ hrs.}}{4 \text{ hours per unit}}$

= 6,000 units

Input Absorbed FO = Actual Hours × Budgeted FO/ hr.

$$= 20,160 \text{ hrs.} \times \frac{₹1,44,000}{24,000 \text{ hrs.}}$$

= ₹ 1,20,960

Actual Hours = 24 days × 840 hrs. per day = 20,160 hours.

Budgeted Hours = 25 days × (120 × 8) hrs. per day = 24,000 hours

Possible FO = Possible Hours × Budgeted FO/hr.

$$= 23,040 \text{ hrs.} \times \frac{Rs. 1,44,000}{24,000 \text{ hrs.}} = Rs.\ 1,38,240$$

FO Cost Variance	$= FO_1 - FO_5 = ₹ 14,680$ (A)
FO Expenditure Variance	$= FO_4 - FO_5 = ₹ 2,000$ (F)
FO Volume Variance	$= FO_1 - FO_4 = ₹ 16,680$ (A)
FO Efficiency Variance	$= FO_1 - FO_2 = ₹ 6,360$ (F)
FO Capacity Variance	$= FO_2 - FO_3 = ₹ 17,280$ (A)
FO Calendar Variance	$= FO_3 - FO_4 = ₹ 5,760$ (A)

Ans. to Q.15

Output Absorbed FO FO_1 ₹ 1,53,090	Input Absorbed FO FO_2 ₹ 1,70,100	Possible FO FO_3 ₹ 1,62,000	Budgeted FO FO_4 ₹ 1,50,000	Actual FO FO_5 ₹ 1,56,000

Output Absorbed FO

= Actual Output × Budgeted FO/ Unit

$$= 1,53,090 \text{ units} \times \frac{₹1,50,000}{1,50,000 \text{ units}}$$

= ₹ 1,53,090

Budgeted Output

= 25 days × 6,000 hrs. per day × 1 unit per hr.

= 1,50,000 units

Actual Output

= 27 days × 6,300 hrs. per day × 0.9 unit per hr.

= 1,53,090 units

Input Absorbed FO

= Actual Hours × Budgeted FO per hr.

$$= 1,70,100 \text{ } hrs. \times \frac{₹ 1,50,000}{1,50,000 \text{ } hrs.}$$

= ₹ 1,70,100

Actual Hours

= 27 days × 6,300 hrs. per day

= 1,70,100 hrs.

Budgeted Hours

= 25 days × 6,000 hrs. per day

= 1,50,000 hrs.

Possible FO

= Possible Hours × Budgeted FO/ hr.

$$= (27 \text{ days} \times 6,000 \text{ hrs./ day}) \times \frac{₹ 1,50,000}{1,50,000 \text{ hrs.}}$$

= ₹ 1,62,000

Ans. to Q.16.

SP x SQAO M_1 ₹ 10/kg. x 2,800 kgs. = ₹ 28,000	SP x AQ M_2 ₹ 10/kg. x 2,900 kgs. = ₹ 29,000	AP x AQ M_3

SQAO	=	1,400 units x 2 kgs./unit = 2,800 kgs.
DMCV	=	$M_1 - M_3$ = ₹ 4,000 (A)
DMPV	=	$M_2 - M_3$ = ₹ 3,000 (A)
DMUV	=	$M_1 - M_2$ = ₹ 1,000 (A)

SR x SHAO L_1 ₹ 20/hr. x 3,420 hrs. = ₹ 68,400	SR x AH L_2 ₹ 20/hr x 3,300 hrs = ₹ 66,000	AR x AH L_3 ₹ 68,000

SHAO = 1,140 units x 3 hrs./unit = 3,420 hrs.

DLCV	$= L_1 - L_3$	$= ₹ 400$ (F)
DLRV	$= L_2 - L_3$	$= ₹ 2,000$ (A)
DLEV	$= L_1 - L_2$	$= ₹ 2,400$ (F)

Fixed Overheads Variances

Output Absorbed FO (FO_1)

$=$ Actual Output x Budgeted FO / Unit

$=$ 1,140 units x ₹ 90 / unit.

$=$ ₹ 1,02,600

Input Absorbed FO (FO_2)

$=$ Actual Hours x Budgeted FO / Hr.

$=$ 3,300 hrs. x ₹ 30 / hr.

$=$ ₹ 99,000

Budegeted FO (FO_3)	$=$	1,000 units x ₹ 90 / unit	$=$	₹ 90,000
Actual FO (FO_4)	$=$	₹ 88,000		
FO Cost Variance	$=$	$FO_1 - FO_4$	$=$	₹ 14,600 (F)
FO Exp. Variance	$=$	$FO_3 - FO_4$	$=$	₹ 2,000 (F)
FO Volume Variance	$=$	$FO_1 - FO_3$	$=$	₹ 12,600 (F)
FO Eff. Variance	$=$	$FO_1 - FO_2$	$=$	₹ 3,600 (F)
FO Capacity Variance	$=$	$FO_2 - FO_3$	$=$	₹ 9,000 (F)

Ans. to Q. No.17
Material Cost Variance :

SP x SQAO M_1	SP x AQ M_2	AP x AQ M_3
₹ 1.5 x 4,150 kgs. $= ₹ 6,225$	₹ 1.5 x 3,900 kgs. $= ₹ 5,850$	₹ 6,435

DMPV $= ₹ 585$ (A)

(SP) (AQ) – (AP) (AQ) $=$ – 585

(₹ 1.5) (AQ) – ₹ 6,435 $=$ – 585

Hence, Actual Quantity consumed = 3,900 kgs.

DMUV $= ₹ 375$ (F)

(SP) (SQAO) – (SP) (AQ) $=$ 375

(₹ 1.5) (SQAO) – ₹ 5,850 $=$ 375

Hence, SQAO = 4,150 kgs.

We know that –

SQAO = Actual Output x Budgeted Input per unit.

Hence, Actual Output $= \dfrac{SQAO}{\text{Budgeted Input / unit}}$

$= \dfrac{4,150 \text{ kgs.}}{10 \text{ kgs./unit}} = 415$ units.

Actual Price of Ratw Material $= \dfrac{\text{Actual Material Cost}}{\text{Actual Input consumed}}$

$= \dfrac{₹ 6,435}{3,900 \text{ kgs.}} = ₹ 1.65 / \text{kg.}$

Labour Cost Variance

SR x SHAO L_1	SR x AH L_2	AR x AH L_3
₹ 8/hr. x 2,075 hrs. = ₹ 16,600	₹ 8/hr. x 2,120 hrs = ₹ 16,960	₹ 16,324

DLRV = ₹ 636 (F)

$(SR)(AH) - (AR)(AH)$ = 636
$(₹ 8/hr.)(AH) - 16,324$ = 636
$AH = 2,120$

Actual Hours worked are 2,120

DLEV = 360 (A)
$(SR)(SHAO) - (SR)(AH)$ = -360
$(₹ 8/hr.)(SHAO) - ₹ 16,960$ = -360   SHAO = 2,075 hrs.

Hence, time allowed for actual production = 2,075 hrs.

$$\text{Actual Wage Rate per hour} = \frac{\text{Actual Lab. Cost}}{\text{Actual Hours}}$$

$$= \frac{₹ 16,324}{2,120} = ₹ 7.7/hr.$$

Fixed Overheads Variances

Output Absorbed (FO_1)	Input Absorbed (FO_2)	Budgeted (FO_3)	Actual (FO_4)
₹ 20,750	₹ 21,200	₹ 20,000	₹ 20,400

FO_1 = Actual Output x Budgeted FO/unit
= 415 units x ₹ 50/unit
= ₹ 20,750

FO_2 = Actual Hours x Budgeted FO/hr.
= 2,120 hrs. x ₹ 10/hr.
= ₹ 21,200

FO Volume Variance
Output Absorbed FO - Budgeted FO = ₹ 750 (F)
₹ 20,750 - Budgeted FO = 750
Hence, Budgeted FO = 750
= ₹ 20,000

FO Expenditure Variance
Budgeted FO - Actual FO = ₹ 400 (A)
₹ 20,000 - Actual FO = ₹ 400 (A)
Hence, Actual FO = -400
= ₹ 20,400

FO Efficiency Variance
= $FO_1 - FO_2$
= ₹ 450 (A)

Ans. to Q. No. 18

FO_1 ↓	FO_2	FO_3	FO_4 ↓	FO_5 ↓
₹ 34,000 (Note - 2)	₹ 30,400 (Note - 3)	₹ 32,000 (Note : 4)	₹ 38,400 (Note - 1)	₹ 48,000

Note – 1 : Annual Budgeted FO = ₹ 4,80,000

Total weeks during the year = 50

No. of weeks in the month = 4

Hence, Budgeted FO during the month = ₹ 4,80,000 × $\frac{4}{50}$ = **₹ 38,400**

Note – 2 : Output absorbed FO = Actual Output × Budgeted FO/unit

$$= \quad 17,000 \text{ units} \times \left(\frac{₹ 4,80,000}{2,40,000} = ₹ 2/\text{unit} \right)$$

= Rs. 34,000

Note 3 : Input Absorbed FO = Actual Hrs. × Budgeted FO/Hr.

= 152 hrs. × ₹ 200/hr. = ₹ 30,400

Actual Hrs. worked = 4 weeks × 38 hrs./week.

= 152 hrs.

Hrs./Week = $\left(48 \text{ hrs.} \times \frac{5 \text{ days}}{6 \text{ days}} \right)$ - 2 hrs. (idle time)

= 38 hrs.

Budgeted FO/hr. = $\dfrac{\text{Budgeted FO}}{\text{Budgeted Hours}}$

= $\dfrac{₹ 4,80,000}{2,400 \text{ hrs.}}$ = ₹ 200 / hr.

Budgeted Hours = $\dfrac{2,40,000 \text{ units}}{100 \text{ units/hr.}}$ = 2,400 hrs.

Note 4 : Possible FO = Possible Hours × Budgeted FO/hr.

= 160 hrs. × ₹ 200/hr.

= ₹ 32,000

Possible Hours = 5 days / week × 4 weeks × 8 hrs./day

= 160 hrs.

Computation of Fixed Overheads Variances

1. FO Cost Variances = $FO_1 - FO_5$ = ₹ 14,000 (A)
2. FO Exp. Variance = $FO_4 - FO_5$ = ₹ 9,600 (A)
3. FO Vol. Variance = $FO_1 - FO_4$ = ₹ 4,400 (A)
4. FO Eff. Variance = $FO_1 - FO_2$ = ₹ 3,600 (F)
5. FO Cap. Variance = $FO_2 - FO_3$ = ₹ 1,600 (A)
6. FO Calender Var. = $FO_3 - FO_4$ = ₹ 6,400 (A)

Ans. to Q. No. 19.

Variable Overheads Variances

Output Absorbed VO VO_1	Input Absorbed VO VO_2	Actual VO VO_3
₹ 28,800	₹ 21,600	₹ 25,000

Output Absorbed VO
- = Standard Hours for Actual Output x Budgeted VO/hr.
- = (1,200 units x 2 hrs./unit) (₹ 12/hr.)
- = 2,400 hrs. x ₹ 12/hr.
- = ₹ 28,800

Input absorbed VO
- = Actual hrs. x Budgeted VO/hr.
- = 1,800 hrs. x ₹ 12/hr.
- = Rs. 21,600

1. VO Expenditure Variances = $VO_2 - VO_3$ = ₹ 3,400 (A)
2. VO Efficiency Variance = $VO_1 - VO_2$ = ₹ 7,200 (F)
3. VO Cost Variance = $VO_1 - VO_3$ = ₹ 3,800 (F)

Fixed Overheads Variances

Output Absorbed FO FO_1	Input Absorbed FO FO_2	Budgeted FO FO_3	Actual FO FO_4
₹ 96,000	₹ 72,000	₹ 80,000	₹ 72,000

Output Absorbed FO
- = Standard hrs. for Actual Output x Budgeted FO / hr.
- = (1,200 units x 2 hrs./unit) $\left(\dfrac{₹\ 80,000}{2,000\ hrs.} \right)$
- = (2,400 hrs.) (₹ 40/hr.) = ₹ 96,000

Input Absorbed FO
- = Actual hours x Budgeted FO/hr.
- = 1,800 hrs. x ₹ 40/hr.
- = ₹ 72,000

4. FO Expenditure Variance = $FO_3 - FO_4$ = ₹ 8,000 (F)
5. FO Volume Variance = $FO_1 - FO_3$ = ₹ 16,000 (F)
6. FO Capacity Variance = $FO_2 - FO_3$ = ₹ 8,000 (A)
7. FO Efficiency Variance = $FO_1 - FO_2$ = ₹ 24,000 (F)
8. FO Cost Variance = $FO_1 - FO_4$ = ₹ 24,000 (F)

Ans. to Q. No. 20

Calculation of Material Cost Variance

SP x SQAO M_1	SP x AQ M_2	AP x AQ M_3
₹ 40/kg. x 480 kgs. = ₹ 19,200	₹ 40/kg x 500 kgs. = ₹ 20,000	₹ 38/kg. x 500 kgs. = ₹ 19,000

SQAO = Actual Output x Budgeted Input / unit
= 120 units x 4 kgs./unit = 480 kgs.

DMCV = $M_1 - M_3$ = ₹ 200 (F)
DMPV = $M_2 - M_3$ = ₹ 1,000 (F)
DMUV = $M_1 - M_2$ = ₹ 800 (A)

Calculation of Labour Cost Variances

SR x SHAO L_1	SR x AHW L_2	SR x AHP L_3	AR x AHP L_4
₹ 16/hr. x 600 hrs. = ₹ 9,600	₹ 16 hrs. x 580 hrs. = ₹ 9,280	₹ 16/hr. x 620 hrs. ₹ 9,920	₹ 11,200

SHAO = 120 units x 5 hrs./unit = 600 hrs.

DLCV = $L_1 - L_4$ = ₹ 1,600 (A)
DLRV = $L_3 - L_4$ = ₹ 1,280 (A)
ITV = $L_2 - L_3$ = ₹ 640 (A)
DLEV = $L_1 - L_2$ = ₹ 320 (F)

Calculation of Variable Overheads Variances

Output Absorbed VO VO_1	Input Absorbed VO VO_2	Actual VO VO_3
₹ 7,200	₹ 6,960	₹ 7,500

Output absorbed = Std. hrs. for actual output x budgeted VO/Hr.
= (120 units x 5 hrs./unit) (₹ 12/hr.) =600 hrs. x ₹ 12/hr. = ₹ 7,200
Input Absorbed VO = Actual hrs. x Budgeted VO/hr. = 580 hrs. x ₹ 12/hr. = ₹ 6,960
VO Cost Variance = $VO_1 - VO_3$ = ₹ 300 (A)
VO Expenditure Variance = $VO_2 - VO_3$ = ₹ 540 (A)
VO Efficiency Variance = $VO_1 - VO_2$ = ₹ 240 (F)

Ans. to Q. No. 21

Budgeted SP/Unit x Budgeted Quantity S_1	Budgeted SP/Unit X Revisted Std. Qty. S_2	Budgeted SP/Unit x Actual Qty. S_3	Actual SP/Unit x Actual Qty. S_4
A → ₹ 5 x 5,000 units B → ₹ 6 x 4,000 units C → ₹ 7 x 3,000 units	₹ 5 x 6,250 units ₹ 6 x 5,000 units ₹ 7 x 3,750 units	₹ 5 x 6,000 units ₹ 6 x 5,000 units ₹ 7 x 4,000 units	₹ 6 x 6,000 units ₹ 5 x 5,000 units ₹ 8 x 4,000 units

Computation of Sales Variances :

	Value Variance $S_4 - S_1$	Price Variance $S_4 - S_3$	Volume Variance $S_3 - S_1$	Mix Variance $S_3 - S_2$	Qty. Variance $S_2 - S_1$
A →	₹ 11,000 (F)	₹ 6,000 (F)	₹ 5,000 (F)	₹ 1,250 (A)	₹ 6,250 (F)
B →	₹ 1,000 (F)	₹ 5,000 (A)	₹ 6,000 (F)	NIL	₹ 6,000 (F)
C →	₹ 11,000 (F)	₹ 4,000 (F)	₹ 7,000 (F)	₹ 1,750 (F)	₹ 5,250 (F)
Total	₹ 23,000 (F)	₹ 5,000 (F)	₹ 18,000 (F)	₹ 500 (F)	₹ 17,000 (F)

Ans. to Q. No.22

Budgeted Margin/Unit x Budgeted Quantity P_1	Budgeted Margin/Unit X Revisted Std. Qty. P_2	Budgeted Margin/Unit x Actual Qty. P_3	Actual Margin/Unit x Actual Qty. P_4
A → ₹ 20 x 800 units B → ₹ 30 x 700 units	₹ 20 x 907 units ₹ 30 x 793 units	₹ 20 x 900 units ₹ 30 x 800 units	₹ 20 x 900 units ₹ 10 x 800 units

Computation of Profit/Margin Variances :

	Value Variance $P_4 - P_1$	Price Variance $P_4 - P_3$	Volume Variance $P_3 - P_1$	Mix Variance $P_3 - P_2$	Qty. Variance $P_2 - P_1$
A	₹ 2,000 (F)	NIL	₹ 2,000 (F)	₹ 140 (A)	₹ 2,140 (F)
B	₹ 13,000 (A)	₹ 16,000 (A)	₹ 3,000 (F)	₹ 70 (F)	₹ 4,930 (F)
Total	₹ 11,000 (A)	₹ 16,000 (A)	₹ 5,000 (F)	₹ 70 (F)	₹ 4,930 (F)

BUDGETARY CONTROL

Q.1. GMR Ltd. has supplied the following summary of its operating resuls for the year ending 31ˢᵗ March. 2013:

	₹ Lakhs
Sales (40,000 units)	48.00
Less: Trade discount	2.40
Net Sales	45.60
Cost of sales	
Direct materials	
Dirct wages	14.40
Factory overheads	12.60
Administration overheads	6.30
Selling and distribution overheads	3.60
	4.50

The following changes are to be incorporated in the budget for the year ending 31ˢᵗ March, 2014:
1. Sales quantity to be increased by 25%.
2. Material prices to increase by 15%.
3. Direct wage rates to go up by 12%.
4. Factory overheads will increase by 15%. In addition, a new facility will be added to the factory laboratory at a recurring cost of ₹ 12,500 per annum.
5. Administration and selling and distribution overheads are estimated to go up by 10% and 14% respectively.
6. There will be no change in the rate of trade discount.
7. All Overheads are fixed.

You are required to present the budget for the year ending 31ˢᵗ March, 2014 showing the details of total cost, sales and profit.

Q.2. Prepare a flexible budget for production at 80% and 100% activity on the basis of the following information :

Production at 50% capaci··	-	5,000 units
Raw Material	-	₹ 80 per unit
Direct Labour	-	₹ 50 per unit
Expenses	-	₹ 15 per unit
Factory expenses	-	₹ 50,000 (50% fixed)
Administration expenses	-	₹ 60,000 (60% variable).

Q.3. The monthly budget for manufacturing overhead of a concern for two levels of activity were as follows :

	60%	100%
Capacity	600	1,000
Budgeted production (units)	₹	₹
	1,200	2,000
	900	1,500
Wages	1,100	1,500
Consumable stores	1,600	2,000
Maintenance	4,000	4,000
Power and fuel	1,000	1,000
Depreciation	9,800	12,000
Insurance		

You are required to :
(a) Indicate which of the items are fixed, variable and semi-variable.
(b) Prepare budget at 60%, 80% and 100% capacity.

Q.4. Vivek Elementary School has a total of 150 students consisting of 5 sections with 30 students per section. The school plans for a picnic around the city during the week end to places such as the zoo, the amusement park, the planetarium, etc. A private transport operator has come forward to lease out the buses for taking the students. Each bus will have maximum capacity of 50 (excluding 2 seats reserved for the teachers accompanying the student). The school will employ two teachers for each bus, paying them an allowance of ₹ 50 per teacher. The following are the other cost estimates :

	Cost per Student (₹)
Breakfast	5
Lunch	10
Tea	3
Entrance fee at zoo	2

Special permit fee ₹ 50 per bus
Block Entrance fee at the planetarium ₹ 250.
Prizes to students for games ₹ 250
Rent per bus ₹ 650

No costs are incurred in respect of the accompanying teachers (except the allowance of ₹ 50 per teacher).

Required :
1. A flexible budget estimating the total cost for the levels of 30, 60, 90, 120 and 150 students.
2. Compute the average cost per student at these levels.

Q.5. The annual budget of a company is as follows :

	60%	100%
Costs : (₹ thousands)		
Direct Material	180	300
Direct Wages	240	400
Factory Overheads	126	150
Administration Overheads	62	70
Selling Overheads	68	80
TOTAL	676	1000

On account of severe competition in the market, the company is presently operating only at 50% capacity, the sales value of production at current prices charged by company being ₹ 6.00 lakhs. It is anticipated that a 10% discount on its selling price will enable the company to improve its competitive position thereby enabling the company to operate at 75% capacity. Present a suitable statement to the management analyzing the implications and giving your recommendations by preparing flexible budget at 50% and 75% capacity.

Q.6. Prepare a Cash Budget for three months ending 30th June, 2013 from the information given below :

(a) Month	Sales (₹)	Materials (₹)	Wages (₹)	Overheads (₹)
February	14,000	9,600	3,000	1,700
March	15,000	9,000	3,000	1,900
April	16,000	9,200	3,200	2,000
May	17,000	10,000	3,600	2,200
June	18,000	10,400	4,000	2,300

(b) _Credit items are :_
Sales / Debtors : 10% sales are on cash, 50% of the credit sales are collected next month and the balance in the following month
Creditors : Materials   2 months
          Wages   ¼ month
          Overheads   ½ month

(c) Cash and Bank balance on 1st April, 2013 is expected to be ₹ 6,000.
(d) Other relevant information is
   1. Plant and machinery will be installed in February, 2013 at a cost of ₹ 96,000. The monthly instalment of ₹ 2,000 is payable from April onwards.
   2. Dividend @ 5% on preference share capital of ₹ 2,00,000 will be paid on 1st June.
   3. Advance to be received for sales of vehicles ₹ 9,000 in June.
   4. Dividends from investments amounting to ₹ 1,000 are expected to be received in June.
   5. Income Tax (advance) to be paid in June is ₹ 2,000.

Q7. Based on the following information prepare a cash budget for ABC Ltd.

	1st Qtr.(₹)	2nd Qtr.(₹)	3rd Qtr.(₹)	4th Qtr.(₹)
Opening Cash balance	10,000			
Collection from Customers	1,25,000	1,50,000	1,60,000	2,21,000
Payments :				
Purchase of Materials	20,000	35,000	35,000	54,200
Other expenses	25,000	20,000	20,000	17,000
Salary and wages	90,000	95,000	95,000	1,09,200
Income Tax	5,000	---	---	---
Purchase of machinery	---	---	---	20,000

The company desired to maintain minimum cash balance of ₹ 15,000 at the end of each quarter. Cash can be borrowed or repaid in multiples of ₹ 500 at an interest of 10% per annum. Management does not want to borrow cash more than what is necessary and wants to repay as early as possible. In any event, loans cannot be extended beyond four quarters. Interest is computed and paid when the principal is repaid. Assume that borrowing take place at the beginning and repayments are made at the end of the quarters.

Q8. From the information given below, prepare a Cash Budget of the Jaipur Refrigerators (P) Ltd., for the quarter January – March, 2009 :

		Dec., 08	Jan., 09	Feb., 09	March, 09	April, 09
a)	Sales Budget Units	60	60	65	75	80
b)	Selling price per unit	₹ 1,000	1,000	1,000	1,000	1,000
c)	Off-season discount	20%	20%	10%	---	---
d)	End of Month Inventory Units	10	12	15	25	25

e) Half the sales proceeds are collected in the month of sale and the other half in the month following.
f) Materials amounting to ₹ 300 per unit manufactured are purchased one month in advance of manufacture and paid for in cash earning 5% cash discount on half of the material purchased.
g) Direct Labour Budget was ₹ 50 per unit and variable overheads ₹ 100 per unit.
h) Indirect Labour Budget was ₹ 6,000 per month.
i) Depreciation was provided uniformly at ₹ 3,000 per month.
j) The fixed overheads budget was ₹ 6,000 per month during off-season and ₹ 7,000 during the season. Out of this, the quarterly premium for fire insurance amounting to ₹ 600 was payable in the first month of each quarter.
k) Dividends for the year 2008, amounting to ₹ 2,000 were expected to be declared in March, 2009 and payments were to be spread between March and April.
l) A machine was sold for ₹ 10,000 in December, 2008 on 3 months credit.
m) The cash balance as on January 1, 2009 is ₹ 1,000.

Q9. A factory manufactures two types of products – X and Y. Product X requires 10 hours to make and product Y requires 20 hours. In a month (25 days of 8 hours each) 500 units of X and 300 units of Y are produced. The budgeted hours are 8,500 per month, the factory employs 60 men in the department concerned. Compute Activity Ratio, Capacity Ratio and Efficiency Ratio.

Q.10. Narang Ltd. Produces two commodities - Good and Better, in one of its departments. Each unit requires 5 hours as production time. 1,000 units of Good and 600 units of Better were produced during March, 2012. Actual man hours spent in this production were 10,000. Yearly budgeted hours are 96,000.

Compute the various control ratios.

Q.11. The activity ratio of concern is 95.6% whereas the capacity ratio is 105%. What is the efficiency ratio.

Q.12. Calculate efficiency and activity ratio from the following data :

Capacity Ratio	=	75%
Budgeted Output	=	6,000 units
Actual Output	=	5,000 units
Standard Time per unit	=	4 hours

Q.13. XYZ & Co. manufactures two products X and Y and sells them through two divisions East and West. For the purpose of submission of sales budget to the budget committee, the following information has been obtained :

Budgeted sales for the current year were :

Product	East	West
X	400 at ₹ 9	600 at ₹ 9
Y	300 at ₹ 21	500 at ₹ 21

Actual sales for the current year were :

Product	East	West
X	500 at ₹ 9	700 at ₹ 9
Y	200 at ₹ 21	400 at ₹ 21

Adequate market studies reveal that product X is popular but under-priced. It is observed tht if price of X is increased by ₹ 1, it will find a ready market. On the other hand, Y is over priced to customers and market could absorb more if sales price of Y be reduced by Re.1. The management has agreed to give effect to the above price changes.

From the information based on these price changes and reports from salesman, the following estimates have been prepared by divisional managers.

Percentages increase in sales over current budget is :

Product	East	West
X	+ 10%	+ 5%
Y	+ 20%	+ 10%

With the help of an intensive advertisement campaign the following additional sales above the estimated sales of divisional managers are possible.

Product	East	West
X	60 units	70 units
Y	40 units	50 units

You are required to prepare a Budget for sales incorporating the above estimates and also show the budgeted and actual sales of the current year.

Q.14. A company manufactures two products A and B. Its sales for the year ending 31st December, 2013 based on the assessments of the divisional managers were

Product A : North 2,00,000 units; South 5,00,000 units and East 1,00,000 units.

Product B : North 3,00,000 units; South 4,00,000 units and East NIL

Sales price : A ₹ 4 and B ₹ 3 in all areas.

Arrangements are made for the extensive advertising of product A and B and it is estimated that North division sales will increase by 1,00,000 units each of A and B. Arrangements are also made to advertise and distribute product B in the Eastern areas where sales are expected to be 5,00,000 units.

Since the estimated sales of the South Division represented an unsatisfactory target, it is agreed to increase both the estimates by 10%.
Prepare a sales budget.

Q.15. A company manufactures two products A and B. A forecast for the number of units to be sold in the first four months of the year is given below :

	Product A Units	Product B Units
January	3,000	6,000
February	3,400	6,000
March	4,200	5,200
April	5,000	4,400

It is anticipated that finished units equal to half the sales for the next month will be in stock at the end of each month (including previous December).
Prepare for the three months ending March 31, a Production Budgeted for each month.

Q.16. From the following data prepare a production budget for the ABC Co. Ltd.

Product	Stock for the budgeted period As on 1st January	As on 30th June
A	8,000	10,000
B	9,000	8,000
C	12,000	14,000

Required to fulfill sales programme :

A	60,000 units
B	50,000 units
C	80,000 units

Normal Loss in production :

A	4%
B	2%
C	6%

Q.17. ABC Ltd. has prepared the following Sales Budget for the first five months of 2013 :

Sales Budget	(in units)
January	10,800
February	15,600
March	12,200
April	10,400
May	9,800

The inventory of finished products at the end of every month is to be equal to 25% of the sales estimate for the next month.

Every unit of product requires two types of material in the following quantities :

Material A	4 kgs.
Material B	2 kgs.

Materials equal to one-half of the next month's consumption are to be on hand at the end of every month. Prepare Materials budget for the first quarter of 2013 in logical form showing the quantities of each types of materials to be purchased every month

Q.18. The Bright Star Company has budgeted sales for 1,00,000 units of its products for 2013. Expected unit costs, based on past experience should be :

	₹
Direct Materials	6
Direct Labour	4
Manufacturing overhead	3

Company begins the year with 40,000 finished units in hand but budgets the ending inventory at only 10,000 units.
Compute the budgeted cost of production for 2013.

Q.19. A company manufactures two products X and Y. The following is an estimate of the number of units expected to be sold in the first seven months of 2013:

	X	Y
January	500	1,400
February	600	1,400
March	800	1,200
April	1,000	1,000
May	1,200	800
June	1,200	800
July	1,000	900

It is anticipated that finished units equal to half the anticipated sales for the next month will be in stock at the end of each month including December, 2012.

The budgeted production and production cost for the year ending 31:12:2013 are as under :

	X	Y
Production (units)	11,000	12,000
	₹	₹
Material cost per unit	10	12
Direct wages per unit	4	6
Production overhead apportioned	39,000	40,000

Prepare (a) a production budget showing the number of units to be manufactured each month; and (b) a production cost budget for 6 months from January to June 2013.

Q.20. A factory works 8 hours per day for 6 days in a week. During each quarter of the year, it is also expected that 124 labour hours will be lost due to leave and holidays. During the next year the company expects to produce 10,000 units of Product A and 4,000 units of Product B.

Required :
(1) Normal available hours per worker per year.
(2) Man Power Budget showing total labour hours required if each unit of Product A requires 2 hours and each unit of Product B require 1 hour.
(3) Number of workers required.
(4) Man Power Budget showing Labour Cost, if wage rate is ₹ 4 per hour for production of A and ₹ 5 per hour for production of B.

Q.21. P Ltd. Manufactures two products using one type of material and one grade of labour. Shown below is an extract from the company's working papers for the next period's budget :

	Product A	Product B
Budgeted sales (units)	3,600	4,800
Budgeted material consumption per product (kg.)	5	3
Budgeted material cost ₹ 12 per kg.		
Standard hours allowed per product	5	4
Budgeted wage rate ₹ 8 per hour		

Overtime premium is 50% and is payable if a worker works for more than 40 hours a week. There are 90 direct workers. Efficiency ratio is 80% and idle hours are 20% of hours worked.

There are twelve 5-days week in the budget period and it is anticipated that sales and production will occur evenly throughout the whole period.

It is anticipated that stock at the beginning of the period will be : Product A 1,020 units; Product B 2,400 units; Raw Material 4,300 kgs.

The target closing stock expressed in terms of anticipated activity during the budget period are : Product A 15 days sales; Product B 20 days sales; Raw Material 10 days consumption.

Required :
Prepare the material purchases budget and the wages budget.

Q.22. A company manufactures and sells a single product and has estimated a sales revenue to ₹ 126 lakhs this year based on the 20% profit on selling price. Each unit of the product requires 3 lbs. of material P and 1.5 lbs. of material Q for manufacture as well as a processing time of 7 hours in the machine shop and 2 ½ hours in the Assembly section. Overheads are absorbed at a rate of 33 1/3% on Direct Labour. The factory works 5 days of 8 hours a week in a normal 52 weeks a year. On the average statutory holidays, leave and absenteeism and idle time amount to 96 hours, 80 hours and 64 hours respectively in a year.

The other details are as under :

Purchase Price	Material P	₹ 6 per lb.
	Material Q	₹ 4 per lb.
Labour Rate	Machine Shop	₹ 4 per hour
	Assembly	₹ 3.20 per hour
No. of Employees	Machine Shop	600
	Assembly	180

	Finished goods	Material P	Material Q
Opening Stock	20,000 units	54,000 lbs.	33,000 lbs.
Closing Stock (Estimated)	25,000 units	30,000 lbs.	66,000 lbs.

You are required to calculate :
(a) The number of units of the product proposed to be sold.
(b) Purchases to be made of Materials P and Q during the year in rupees.
(c) Capacity utilization of Machine Shop and Assembly Section, along with your comments

Q.23. A single product company estimated it sales for the next year quarter-wise as under :

Quarter	Sales (Units)
I	30,000
II	37,500
III	41,250
IV	45,000

The opening stock of finished goods is 10,000 units and the company expects to maintain the closing stock of finished goods at 16,250 units at the end of the year. The production pattern in each quarter is based on 80% of the sales of the current quarter and 20% of the sales of the next quarter.

The opening stock of raw materials in the beginning of the year is 10,000 kg. and the closing stock at the end of the year is required to be maintained at 5,000 kg. Each unit of finished output requires 2 kg. of raw materials.

The company proposes to purchase the entire annual requirement of raw materials in the first three quarters in the proportion and at the prices given below.

Quarter	Purchase of raw materials % to total annual requirement in quantity	Price per kg.
I	30%	2
II	50%	3
III	20%	4

You are required to present the following for the next year, quarter wise :
(i) Production budget (in units).
(ii) Raw material consumption budget (in quantity).
(iii) Raw material purchase budget (in quantity and value).

Q.24. Z Ltd. had a plan for selling 5,000 units per month at an average selling price of ₹ 10 per unit. The Budgeted variable cost of production was ₹ 4 per unit and the fixed costs were budgeted at ₹ 20,000, the planned income being ₹ 10,000 per month. Due to shortage of raw materials, only 4,000 units could be produced and the variable cost increased by 50 paise per unit. The selling price was raised by ₹ 1 per unit. In order to improve the production process, an expenditure of ₹ 1,000 was incurred for research and development activities.

Required : Prepare (a) Performance Budget and (b) Summary Report indicating Planned Income and Actual Income.

Q.25. On 30th September, 2012 the Balance Sheet of a Company was as under :

Liabilities	₹	Assets		₹
Equity Shares of ₹ 10 each	20,000	Equipment (at cost)	20,000	
Reserves and Surplus	10,000	Less : Depreciation	5,000	15,000
Trade Creditors	40,000	Stock		20,000
Proposed Dividend	15,000	Trade Debtors		15,000
	85,000	Balance at Bank (b. B)		35,000
				85,000

The company is developing a system of forward planning, and on 1st October, 2012 it supplies the following information :

Month	Credit Sales ₹	Cash Sales ₹	Credit Purchases ₹
September 2012 (Actual)	15,000	14,000	40,000
October 2012 (Budget)	18,000	5,000	23,000
November 2012 (Budget)	20,000	6,000	27,000
December 2012 (Budget)	25,000	8,000	26,000

All trade debtors are allowed one month's credit. All trade creditors are paid in the month following delivery. Gross Profit Ratio is 25%.

On 1st October, 2012, all the equipment will be replaced at a cost of ₹ 30,000, ₹ 14,000 will be allowed in exchange for the old equipment and a net payment of ₹ 16,000 was made. The proposed dividend will be paid in December, 2012.

The following expenses will be paid :

Wages ₹ 3,000 per month, Selling Overheads ₹ 1,500 per month, Rent ₹ 3,600 for the year (to be paid in October, 2012).

Required : (a) Prepare a Cash Budget for the months of October, November and December, and (b) Prepare Income Statement for the three months ended 31st December, 2012 showing the amount of profit.

IMPORTANT THEORETICAL QUESTIONS

Q.1. Define budget and budgetary control. State the advantages of budgetary control in an organization.

Ans.: Budget is a written plan covering projected activities of a firm for a defined period of time, expressed in quantitative terms.

Budgetary Control is a system which uses budget as a means of planning and controlling.

Advantages of Budgetary Control :
1. There is a planned approach to expenditure and financing of the business.
2. Budgetary control combines the ideas of different levels of management in the preparation of the budget.
3. A budget provides an incentive whenever it is set on attainable results.
4. It directs capital expenditure in the most profitable channels.
5. The budget of cash receipts and expenditure ensures sufficient working capital and other resources for the efficient operation of the business.
6. Budgeting co-ordinates the activities of the various departments and functions by setting their limits and goals.

Q.2. What are limitations of budgetary control ?

Ans.: Budgetary is not a foolproof tool. Those who consider using budgetary control must be fully aware of its limitations. The principal limitations are as follows :
1. The budget plan is based on estimates. The strength or weakness of a budgetary control system depends to a large extent on the accuracy with which estimates are made.
2. A budgetary programme must be continuously adapted to fit changing circumstances. Normally, it takes several years to attain a reasonably good system of budgetary control.
3. Execution of a budget will not occur automatically. All levels of management must participate enthusiastically in the programme for the realization of budgetary goals.
4. No budgetary system will eliminate the necessity for superior executive ability in every major business decision. In other words, budgeting does not take the place of management but rather it is tool management.
5. It is essential that there must be some co-relation between the cost of the system and the benefits derived from it. It is quite common to find that operation of budgeting becomes so costly that small concern cannot afford to adopt.

Q.3. What do you think are the essentials of an effective budgetary control system ?

Ans.: The following are the requirements of a good budgeting system :
1. <u>Co-operation of Top Management</u> : Budgeting must have complete co-operation of the top management.
2. <u>Maximum Profit</u> : The ultimate object of releasing maximum profit should always be kept upper most.
3. <u>Budget Committee</u> : A budget committee should be established consisting of the budget director, chief executive officer and executives of various departments of the organization.
4. <u>Constant Vigilance</u> : Effective system of budgeting requires that periodic reports comparing budget and the actual result should be prepared promptly. As soon as unfavourable trends are detected immediately remedial action should be taken.
5. <u>Reasonably Attainable Goods</u> : Budget figures should be realistic and represent reasonably attainable goals.
6. <u>Adequate Accounting System</u> : The accounting system in the business should be adequate such as to hold each part of the organization to its responsibilities.

Q.4. Distinguish between fixed budget and flexible budget. Briefly state the circumstances in which flexible budgets are used.

Ans.: A flexible budget may be defined as a budget which is designed to change in accordance with the level of activity actually attained. This is in contrast to a fixed budget which is defined as a budget designed to remain unchanged irrespective of the level of activity actually attained.

The figures used in a flexible budget are more adaptable to any given set of operating conditions. It is more elastic, useful and practical. Flexible budgets are necessary for control. The object here is to assess what any individual cost should have been in view of the level of activity actually attained.

Under the following circumstances, flexible budgets should be used :

1. Those companies should use flexible budgeting which keep on introducing new products or make frequent changes in the product design. In such companies it is rather difficult to forecast sales with accuracy.
2. Industries with seasonal fluctuations in sales and/or production like ice cream, soft drinks, *etc.* should also use flexible budgets.
3. Industries which are more prone to changes in fashion, like redy made garments should also use flexible budgets.
4. Industries which are engaged is made to order business like ship building should use flexible budgets.

Q.5. What is zero base budgeting ? What are the advantages of zero base budgeting?

Ans.: Generally budgets are prepared by taking previous year's budget as the base. Adjustment are made in the budget of the last year for any changes that are likely to take place in the budget period.

Zero Base Budgeting (ZBB) is a new concept in preparation of budgets. In ZBB, instead of taking previous year's figures as the base, every item has to justify its inclusion in the budget. ZBB is defined as a system whereby each budget item, regardless of whether it is new or existing, must be justified in its entirety each time a new budget is prepared.

The advantage of ZBB are as follows :
1. In ZBB all activities included in the budget are justified on cost benefit consideration which promotes more effective allocation of resources.
2. It is an educational process and can promote a management team of talented and skillful people which lend to promptly respond to changes in the business environment.
3. It identifies inefficient and unnecessary activities and avoid wasteful expenditure.

Q.6. What do you understand by Performance Budgeting ? What steps are required to be taken for preparing performance budgets ?

Ans.: Performance budgeting is a relatively new concept which focuses on functions, programmes and activities. Performance budgets are established in such a manner that each item of expenditure related to specific responsibility center is closely linked with the performance of that center.

Steps in performing budgeting
1. *Establishment of responsibility centers* : First of all, responsibility centers are established. A responsibility center is a segment of an organization where an individual manager is held responsible for the performance of the segment.
2. *Establishment of performance targets* : For each responsibility center, targets are set in terms of physical performance to be achieved. For example, for sales department, which is a responsibility center, targets may be set in terms of number of units to be sold during the budget period. For production department, the target would then be the number of units to be produced.
3. *Estimating financial requirement* : In this step, the financial support needed to achieve the physical targets is estimated. In other words, the amount of expenditure involved under various heads to meet the physical performance is forecasted.

4. **Comparison of actual with budgeted performance :** This is an usual step in budgetary control to evaluate the actual performance.

5. **Reporting and action :** Variance from budgeted performance are analysed and reporting for corrective action to be taken.

Q.7. **What are Budget Reports ? What are its essential characteristics ?**

Ans.: Establishing budgets in itself is of no use unless there is a continuous flow of budget reports showing comparison of actual and budget figures. Budget reports should be prepared at regular intervals showing the reasons for the differences between actual and budget figures. The reports should be prepared in such a way that they establish the responsibility for the variance. Reports should also reveal whether a variance is favourable or unfavourable and also whether a variance is controllable or uncontrollable.

Essentials of a Budget Report – The following essentials should be kept in mind while preparing budget reports

(a) The budget reports should be simple and suitable for the level of understanding of the user.

(b) Reports should be presented promptly.

(c) Reports should be accurate.

(d) The report should contain only essential information according to the needs of the user

Q.8. Define Functional Budgets, Master Budget, Long-term Budget, Short-term Budget, Basic Budget and Current Budget.

Ans.: *Functional Budget :* Budgets which relate to the individual functions in an organization are known as Functional Budgets. For example, purchase budget, sales budget; production budget; plant-utilisation budget and cash budget.

Master Budget : It is a consolidated summary of the various functional budgets. It serves as the basis upon which budgeted P & L A/c. and forecasted Balance Sheet are built up.

Long-term Budgets : The budgets which are prepared for periods longer than a year are called long-term budgets. Such budgets are helpful in business forecasting and forward planning. Capital expenditure budget and Research and Development budget are examples of long-term budgets.

Short term Budgets : Budgets which are prepared for periods less than a year are known as short-term budgets. Cash budget is an example of short-term budget.

Basic Budgets : A budget which remains unaltered over a long period of time is called basic budget.

Current Budgets : A budget which is related to the current conditions is called current budget.

Q.9 Distinguish between Standard Costing and Budgetary Control?

Ans.: Budget control and Standard costs have the commmon objective of cost control by estblishing pre-determined costs. There are certain basic principes which are common to both budgetary control and standard costing. These are being given below

- Establishment of pre-determined targets of performance.
- The measurement of actual performance.
- The comparison of actual performance with the predetermined performance.
- Analysis of the difference between actual and predetermined performance.
- To take remedial steps where necessary

Inspite of these points of similarity, there are some important differnces between budgtary control and standard costing

1. Budgets are prepared for different functions of the organization like sales, purchases, production etc. This classification is as per financial records. In standard costing, on the other hand, costs are compiled by clasifying, recording and allocating expenses.

2. Budget costs are used for forecasting requirements of diferent functions like finance. sales etc., whereas standard costs do not reveal what the costs are expected to be but what the costs should be, if certain performances are acethved.

3. In budgetary control, variances are not revalead. Variances are used only as statistical informaton for exercising control. But under standard costing system, variances are revealed.

Q.10 **Distinguish betwene conventional budgeting and zero base budgeting**

Ans.: Zero Base Budgeting (ZBB) is an alternative budget system in which while preparing budets, pevious year's budget is not taken as base. Conventional budgeting in any organization is mostly done in such a way that each year all departmetns are given a maximum amount to spend. No justification is required on the part of any department for spending the budgeted amount. The main disadvantage of such budgeting is that the inefficiencies of the previous years creep into this year's budget. In such a budget, justification is to be given only for new or addiional funds required.

In ZBB, each item in the budget is required to be justified each year. In presenting the budget, the manager of each deaprtment is asked to justify the needs of the deaprtment according to his perception. The budet committee considers the requests of all the departments and makes budget allocations according to the available sources. A ZBB may be defined as a system whereby each budget item, whether it is new or existing, has to be justified in its entirety. ZBB discards the attitude of accepting the existing position blindly. However, ZBB is a costly system of budgeting as it requires high volume of paper work.

REVISIONARY PROBLEMS

Q.1 The following information has been made available from the records of a company for last six months of 2006 (and the sales of January 2007) in respect of product X:

(i) The units to be sold in different months are:

July 2006	1,100			
August 2006	1,100	November 2006	2,500	
September 2006	1,700	December 2006	2,300	
October 2006	1,900	January 2007	2,000	

(ii) Finished units equal to half the sales of the next month will be in stock at the end of every month (including June 2006).

(iii) Budgeted production and production cost for the year ending 31st Dec., 2006 are thus:

Production (units)	22,000
Direct materials per unit	₹ 10
Direct wages per unit	₹ 4
Total factory overhead apportioned to production	₹ 88,000

You are required to prepare:

(a) Production budget for the six months of 2006, and

(b) Summarized production cost budget for the same period.

Q.2 The sales manager of XYZ Ltd. reports that next year he expects to sell 50,000 units of a certain product.

Two kinds of raw materials A and B are required for manufacturing the product. Each unit of the product requires 2 kg of A and 3 kg of B. The estimated opening balances at the commencement of the next year are – Finished Product, 10,000 units; A, 12,000 kg; B 15,000 kg. The desirable closing balances at the end of the next year are: Finished product, 14,000 units; A, 13,000 kg; B, 16,000 kg.

Draw up a Materials Purchase Budget for the next year.

[Ans. Material A → 1,09,000 kgs.; Material B → 1,63,000 kgs.]

Q.3 Draw up a flexible budget for overhead expenses on the basis of the following data at 70%, 80% and 90% plant capacity.

	AT 80% CAPACITY
	₹
Variable overheads:	
Indirect labour	12,000
Stores including spares	4,000
Semi-variable overheads:	
Power (30% fixed, 70% variable)	20,000
Repairs and maintenance (60% fixed, 40% variable)	2,000
Fixed overheads:	
Depreciation	11,000
Insurance	3,000
Salaries	10,000
	62,000
Total overheads	

Q.4 Prepare flexible budget for the overheads at 50%, 60% and 70% capacity:

	AT 60% CAPACITY ₹
Variable overheads:	
Indirect material	₹ 6,000
Indirect labour	₹ 18,000
Semi-variable overheads:	
Electricity (40% fixed, 60% variable)	₹ 30,000
Repair (80% fixed, 20% variable)	₹ 3,000
Fixed overheads:	
Depreciation	₹ 16,500
Insurance	₹ 4,500
Salaries	₹ 15,000

Q.5 The expenses budgeted for production of 10,000 units in a factory are furnished below:

	₹ per unit
Materials	70
Labour	25
Variable overheads	25
Fixed overheads (₹ 1,00,000)	10
Selling expenses (10% fixed)	13
Distribution expenses (20% fixed)	7
Administration expenses (₹ 50,000)	5
Total	155

Prepare a budget for the production of (a) 8,000 units, and (b) 6,000 units.

Assume that administration expenses are rigid for all levels of production.

Q.6 The budget manager of Jupiter Electricals Limited is preparing flexible budget for the accounting year starting from 1 July, 2006.

The company produces one product – DETX II. Direct material costs ₹ 7 per unit. Direct labour averages ₹ 2.50 per hour and requires 1.6 hours to produce one unit of DETX II. Salesmen are paid a commission of Re. 1 per unit sold. Fixed selling and administrative expenses amount to ₹ 85,000 per year.

Manufacturing overhead is estimated in the following amounts under specified volumes:

Volume of production (in units)	1,20,000 ₹	1,50,000 ₹
Expenses:		
Indirect material	2,64,000	3,30,000
Indirect labour	1,50,000	1,87,500
Inspection	90,000	1,12,500
Maintenance	84,000	1,02,000
Supervision	1,98,000.	2,34,000
Depreciation of plant and Equipment	90,000	90,000
Engineering services	94,000	94,000
Total manufacturing overhead	9,70,000	11,50,000

Prepare a Total Cost Budget for 1,40,000 units of production.

[Ans. Total Budgeted Cost of ₹ 28,55,000 at the level of 1,40,000 units]

Q.7 The manager of Repairs and Maintenance Department in response to a request, submitted the following budget estimates for his department that are to be used to construct a flexible budget to be used during the coming budget year:

Details of cost	Planned at 6,000 direct repair hours	Planned at 9,000 direct repair hours
Employee salaries	30,000	30,000
Indirect repair materials	40,200	60,300
Miscellaneous cost, etc.	13,200	16,800

(a) Prepare a flexible budget for the department up to activity level of 10,000 repair hours (use increments of 1,000 hours).

(b) What would be the budget allowance at 8,500 direct repair hours?

[Ans. (a) 6,000 hrs. → ₹ 83,400; 7,000 hrs. → ₹ 91,300; 8,000 hrs. → 99,200; 9,000 hrs. → ₹ 1,07,100; 10,000 hrs. → ₹ 1,15,000.

(b) ₹ 1,03,150]

Q.8 Draw a material procurement budget (quantitative) from the following information:

Estimated sales of a product is 40,000 units. Each unit of the product requires 3 units of material A and 5 units of material B.

Estimated opening balances at the commencement of the next year:

Finished product	5,000 units of stock
Material A	12,000 units
Material B	20,000 units

Materials on order:

Material A	7,000 units cl. stock
Material B	11,000 units

The desirable closing balances at the end of he next year:

Finished product	7,000 units
Material A	15,000 units
Material B	25,000 units

Materials on order:

Material A	8,000 units
Material B	10,000 units

[Ans. Material A → 1,30,000 units; Material B → 2,14,000 units]

Q.9 The following are the estimated sales of a company for eight months ending 30.12.2006:

Months	Estimated sales (units)
April 2006	12,000
May 2006	13,000
June 2006	9,000
July 2006	8,000
August 2006	10,000
September 2006	12,000
October 2006	14,000
November 2006	12,000

As a matter of policy, the company maintains the closing balance of finished goods and raw materials as follows:

Stock item	Closing balance of a month
Finished goods	50% of the estimated sales for the next month
Raw materials	Estimated consumption for the next month

Every unit of production requires 2 kg of raw material costing ₹ 5 per kg.

Prepare production budget (in units) and Raw Material Purchase Budget (in units and cost) of the company for the half year ending 30 September, 2006.

Q.10 Prepare a flexible budget for production at 80 per cent and 100 per cent activity on the basis of the following information:

Production at 50% capacity	5,000 units
Raw materials	₹ 80 per unit
Direct labour	₹ 50 per unit
Direct expenses	₹ 15 per unit
Factory expenses	₹ 50,000 (50% fixed)
Administration expenses	₹ 60,000 (60% variable)

Q.11. From the following data, prepare a flexible budget for production of 40,000 units and 75,000 units, distinctly showing variable cost and fixed cost as well as total cost. Also indicate element-wise cost per unit. Budgeted output is 1,00,000 units and budgeted cost per unit is as follows :

Direct Material	95
Direct Labour	50
Production overhead (variable)	40
Production overhead (fixed)	5
Administration overhead (fixed)	5
Selling overhead (10% fixed)	10
Distribution overhead (20% fixed)	15

Q.12. Goldman Company Limited operates on a system of Flexible Budgets. With the aid of the following information, you are required to prepare Flexible Budget at 80%, 90% and 100% level of activity showing the profits that would result at these levels :

(i) The present sale of 8,00,000 units at ₹ 10 each is at the normal level of 80%. If the output is increased to 90%, the selling price will be reduced by 2.5% and if the output reached 100%, the original selling price will be reduced by 5% in order to reach a wider market.

(ii) The prime cost per unit is ₹ 5 made up of Direct Materials ₹ 3.50, Direct Labour ₹ 1.25 and Direct Expenses ₹ 0.25. If output reaches 90% level of activity and above, a saving of 5% can be effected in the purchase price of raw materials.

(iii) Variable Overhead – Salesmen's commission will be 5% of the sales value.

(iv) Semi-variable overhead at normal level of activity are :

	₹
Supervision	80,000
Power	70,000
Heat and Light	40,000
Maintenance	50,000
Salesmen Expenses	60,000
Indirect lABOur	1,00,000
Transport Costs	2,00,000

These are expected to increase by 5% if output reaches 90% level and by a 10% if it reaches the 100% level.

(v) Fixed Overheads are :

	₹
Rent and Rates	
Depreciation	1,00,000
Advertisement	4,00,000
Administration	5,00,000
Sales Department	7,50,000
General	2,00,000
	50,000

[Ans. ₹ 10,00,000 (80%); ₹ 13,63,750 (90%) and ₹ 15,40,0000 (100%)]

Q.13. The profitability statement of Gourmet Co. Ltd. has been summarized as follows :

	₹	₹
Sales (30,000 units)		15,00,000
Direct Materials	4,50,000	
Direct Wages	3,00,000	
Variable Overheads	1,20,000	
Fixed Overheads	4,40,000	13,10,000
Profit		1,90,000

During the next period, the company will produced and sell one – third extra quiantity. It is proposed that the selling price of this only product manufactured by the company should be reduced by 5%.

You are required to prepare a forecast statement which should show the effect of the proposed reduction in selling price and include any changes in costs expected during the coming year. The following additional information is given :

(i) Sales forecast ₹ 19,00,000 (after reduction).
(ii) Direct material prices are expected toincrease by 2% per unit.
(iii) Direct wage rates are expected to increase by 5% per unit.
(iv) Variable overheads are expected to increase by 5% per unit.
(v) Fixed overheads will increase by ₹ 20,000.
[Ans. ₹ 2,40,000]

Q.14. Paints Private Ltd. Company, manufacturing a single product, is facing severe competitionin selling it at ₹ 50 per unit. The company is operating at 60% level of capacity at which level the sales are ₹ 12,00,000 and variable costs are ₹ 30 per unit. Semi-variable costs may be considered as fixed at ₹ 90,000 when output is nil and the variable elements in ₹ 250 for each additional 1% level of activity. Fixed costs are ₹ 1,50,000 at the present level of activity. But at 80% level of activity or above, these costs are expected to increase by ₹ 50,000.

To cope with the competition, the management of the company is considering a proposal to reduce the selling price by 5%. You are required to prepare a statement showing the operating profit at levels of activity of 60%, 70%, 80%, 90% assuming that ·
(a) The selling price remains at ₹ 50
(b) The selling price is reduced by 5%

[Ans. Profit → Rs. 1,65,000; ₹ 2,32,500; ₹ 2,50,000; ₹ 3,17,500]

Q.15. XYZ Ltd. provides you the following figures for the year 2011 :

		Product A	Product B
Sales (in units) :	Ist Quarter	1,250	1,600
	IInd Quarter	2,950	800
	IIIrd Quarter	2,700	1,000
	IVth Quarter	3,100	600
Selling price per unit		₹ 24	₹ 50
Target for 2012			25%
Sales quantity increase (decrease)		(20%)	(20%)
Selling price increase (decrease)		25%	

Required : Prepare Sales Budget for the year 2012.

[Ans. Product A → ₹ 2,40,000; Product B → ₹ 2,00,000]

Q.16. A manufacturing company provides you the following information

	Product A	Product B
Material X @ ₹ 3 per kg,	2 kg.	4 kg.
Material Y @ ₹ 1 per kg.	1 kg	2 kg.
Units to be produced as per production budget	10,000	4,000

Inventory of raw material :

	Material X	Material Y
Opening Stock	12,000 kgs.	2,000 kgs.
Estimated closing stock	16,000 kgs.	4,000 kgs.

Required : Prepare Direct Material Purchase Budget.

[Material X → 40,000 kgs. (₹ 1,20,000); Material Y → 20,000 kgs. (₹ 20,000)]

Q.17. Three articles X, Y and Z are produced in a factory. They are through two cost centres A and B. From the data furnished, compile a statement for Budgeted Machine Utilisation in both the centres

(a) Sales Budget for the year

Product	Annual Budgeted Sales (units)	Opening Stock of finished Goods (units)	Closing Stock of finished Goods
X	4,800	600	Equivalent to 2 months sales
Y	2,400	300	Equivalent to 2 months sales
Z	2,400	800	Equivalent to 2 months sales

(b) Machine Hours required per unit :

	Machine Hours Per Unit	
	Machine A	Machine B
X	30	70
Y	200	100
Z	30	20

Prepare (1) Production Budget, and (2) Machine Utilisation Budget.

[Ans. (1) Prouct X → 5,000 units; Product Y → 2,500 units; Product Z → 2,000 units
(2) Machine A → 7,10,000 M. hrs.; Machine B → 6,40,000 M. hrs.

Q.18. X Ltd. manufacturing three products, has the following direct labour requirements for the products :

Operation	Direct Labour time per unit (in minutes)		
	Products		
	I	2	3
I	18	42	30
II			12
III	9		6

The factory works 8 hours per day, 6 days in a week. Each budget quarter has 13 weeks and in terms of leave, holidays and other causes, 124 hours are lost in each quarter. Operations I, II and III have the budgeted hourly rates for workers at ₹ 16, ₹ 20 and ₹ 24 respectively. The budgeted sales of the products during the quarter are :

Product I	9,000 units
Product 2	15,000 units
Product 3	12,000 units.

There were opening stocks of 5,000 units of Product 2 and 4,000 units of Product 3 and it is proposed to have closing stock at the end of the budget quartr as follows

Product 1	1,000 units
Product 3	2,000 units.

Required :
1. Proudction Budget
2. Direct Labour Hours Budget.
3. Available Labour Hours per worker per quarter.
4. Number of workers required.
5. Direct Labour Cost Budget.

[Ans. 1. Product 1 → 10,000 units; Product 2 → 10,000 units; Product 3 → 10,000 units
   2. Operation 1→15,000 hrs.; Operation 2→6,000 hrs.; Operation 3→2,500 hrs.
   3. 500 hrs.
   4. Total 47 workers
   5. Total Labour Cost ₹ 4,20,000]

Q.19. Production costs of a factory for a year are as follows :

	₹
Direct Wages	80,000
Direct Materials	1,20,000
Production Overheads, Fixed	40,000
Production Overheads, Variable	60,000

During the forthcoming year it is anticipated that
(a) the average rate for direct labour remuneration will fall from ₹ 3 per hour to ₹ 2.50 per hour,
(b) production will remain unchanged
(c) direct labour hours will increase by 25%.

The purchase price per unit of direct materials and other materials and services which comprise overheads will remain unchanged.

Prepare : Production Cost Budget.

[Ans. ₹ 3,03,333]

Q.20. The following information relating to the third and last quarter of 2003-04 are furnished by a company which manufactures and sells a single product :

			Third quarter (Actuals)	Last quarter (Estimate)
Sales			₹ 6,24,000	₹ 6,60,000
			Closing Balance	Closing balance
Raw Material 'A' (kg.)			23,500	25,000
Raw Material 'B' (kg.)			13,400	15,000
Finished goods (units)			700	1,000

Unit Cost Data :		
Raw Material 'A'	10 kg. @ ₹ 3 =	₹ 30
Raw Material 'B'	5 kg. @ ₹ 2 =	₹ 10
Direct Labour	Machine shop =	₹ 20
(Machine time 5 hrs. @ ₹ 4)	=	₹ 10
Assembly 2 hrs. @ ₹ 5		
(labour time)		

Production Overheads :
Machine shop @ ₹ 12 per hr.
Assembly @ ₹ 10 per hr.   20% of production cost
Selling Overhead   10% on selling price
Profit margin

You are required to prepare for the last quarter of the year :
- (a) Statement showing selling price per unit.
- (b) Production budget (in units)
- (c) Purchase Budget (quantity and value)
- (d) Total cost budget.

[Ans. a. ₹ 200 per unit.
     b.   3,600 units
     c.   Material A → 37,500 kgs.; ₹ 1,12,500;
          Material B → 19,600 kgs; ₹ 39,200
     d.   ₹ 6,48,000

SOLUTIONS TO REVISIONARY PROBLEMS

Ans. to Q. 1

Product Budget
For the six months ending Dec., 2006

	July Units	Aug. Units	Sep. Units	Oct. Units	Nov. Units	Dec. Units	Total
Estimated sales	1,100	1,100	1,700	1,900	2,500	2,300	
Add: Closing stock	550	8,50	950	1,250	1,150	1,000	
	1,650	1,950	2,650	3,150	3,650	3,300	
Less: Opening stock	550	550	850	950	1,250	1,150	
Production	1,100	1,400	1,800	2,200	2,400	2,150	11,050

Production Cost Budget
For the six months ending Dec., 2006

		(Production: 11,050 units)
Direct material	@ ₹ 10 for 11,050 units	1,10,500
Direct wages	@ ₹ 4 for 11,050 units	44,200
*Factory overhead	@ ₹ 4 for 11,050 units	44,200
Total Production Cost		1,98,900

*Factory overhead per unit = ₹ 88,000 ÷ 22,000 units = ₹ 4.

Ans. to Q.2

Production Budget

Sales during the year	50,000 units
Add: Desired stock at the end of the next year	14,000 units
Total	64,000 units
Less: Expected stock at the beginning of the next year	10,000 units
Estimated production	54,000 units

Raw Material Purchase Budget

	Material A Kg.	Material B Kg.
Consumption during the year:	1,08,000	—
A – 54,000 units @ 2 kg per unit	—	1,62,000
B – 54,000 units @ 3 kg per unit	13,000	16,000
Add: Desired stock at the end of next year	1,21,000	1,78,000
Less: Expected stock at the commencement of the next year	12,000	15,000
Quantities of material to be purchased	1,09,000	1,63,000

Ans. to Q.3

Flexible Budget

	At 70% capacity ₹	At 80% capacity ₹	At 90% capacity ₹
Variable overheads:			
Indirect labour	10,500	12,000	13,500
Stores including spares	3,500	4,000	4,500
Semi-Variable overheads:			
Power : Fixed	6,000	6,000	6,000
Variable	12,250	14,000	15,750
Repairs and Maintenance:			
Fixed	1,200	1,200	1,200
Variable	700	800	900
Fixed Overheads:			
Depreciation	11,000	11,000	11,000
Insurance	3,000	3,000	3,000
Salaries	10,000	10,000	10,000
Total Overhead	58,150	62,000	65,850

Working Notes:

1. Indirect labour cost at 70% = $12,000 \times \dfrac{70}{80} = Rs.10,500$

     at 90% = $12,000 \times \dfrac{90}{80} = Rs.13,500$

Similar calculation for other variable item, i.e., stores.

2. Power – Fixed = ₹ 6,000, Variable = ₹ 14,000.

     Variable power at 70% = $14,000 \times \dfrac{70}{80} = ₹12,250$

     at 90% = $14,000 \times \dfrac{90}{80} = ₹15,750$

Similar calculation for repairs and maintenance

3. Direct labour hours at 70% = $1,24,000 \times \dfrac{70}{80} = ₹1,08,500$

     at 90% = $1,24,000 \times \dfrac{90}{80} = ₹1,39,500$

Ans. to Q.4

Flexible Budget

	50% ₹	60% ₹	70% ₹
Variable overheads:			
Indirect materials	5,000	6,000	7,000
Indirect labour	15,000	18,000	21,000
Semi-Variable overheads:			
Electricity – Fixed	12,000	12,000	12,000
Variable	15,000	18,000	21,000
Repairs – Fixed	2,400	2,400	2,400
Variable	500	600	700
	16,500	16,500	16,500

Fixed Overheads:

		CA. R. K. MEHTA		
Depreciation		4,500	4,500	4,500
Insurance		15,000	15,000	15,000
Salaries		85,900	93,000	1,00,100
Total Overhead				

Ans. to Q.5

Flexible Budget

Particulars	6,000 units		8,000 units		10,000
Variable Expenses:					
1. Materials	70	4,20,000	70	5,60,000	70	7,00,000
2. Labour	25	1,50,000	25	2,00,000	25	2,50,000
3. Variable overheads	25	1,50,000	25	2,00,000	25	2,50,000
4. Variable selling expenses	11.70	70,200	11.70	93,600	11.70	1,17,000
5. Variable distribution expenses	5.60	33,600	5.60	44,800	5.60	56,000
Total Variable Expenses	137.30	8,23,800	137.30	10,98,400	137.30	13,73,000
Fixed Expenses:					
1. Fixed overheads	16.67	1,00,000	12.5	1,00,000	10	1,00,000
2. Fixed selling expenses	2.17	13,000	1.625	13,000	1.3	13,000
3. Fixed distribution expenses	2.33	14,000	1.75	14,000	1.4	14,000
4. Fixed administration expenses	8.33	50,000	6.25	50,000	5	50,000
Total Fixed Cost	29.50	1,77,000	22.125	1,77,000	17.4	1,77,000
Total Cost	166.80	10,00,800	159.425	12,75,400	155	15,50,000

Ans. to Q.6

Budget for the year ending 30th June, 2007

	Output 1,40,000 units
	₹
Variable Costs:	
1. Direct material @ ₹ 7 per unit	9,80,000
2. Direct labour @ ₹ 4 per unit	5,60,000
3. Salesman's commission @ Re. 1 per unit	1,40,000
4. Indirect materials @ ₹ 2.20 per unit	3,08,000
5. Indirect labour @ 1.25 per unit	1,75,000
6. Inspection @ ₹ 0.75 per unit	1,05,000
Semi-variable costs:	
1. Supervision – Fixed	54,000
– Variable @ ₹ 1.20 per unit	1,68,000
2. Maintenance – Fixed	12,000
– Variable @ Re. 0.60 per unit	84,000
Fixed Costs:	
1. Depreciation	90,000
2. Engineering services	94,000
3. Selling and distribution expenses	85,000
Total	**28,55,000**

Supervision Cost

$$\text{Variable cost per unit} = \frac{\text{Change in cost}}{\text{Change in output}} = \frac{Rs. 2,34,000 - 1,98,000}{1,50,000 - 1,20,000 \text{ units}}$$

$$= \frac{36,000}{30,000} = Rs. 1.20 \text{ per unit}$$

Fixed supervision cost = $1,98,000 - (1,20,000 \times 1.20) = ₹ 54,000$

Similar calculation for maintenance cost.

Ans. to Q.7

(a) Flexible Budget

For the period.......

Direct repair hours	6,000 ₹	7,000 ₹	8,000 ₹	9,000 ₹	10,000 ₹
Employee salaries	30,000	30,000	30,000	30,000	30,000
Indirect materials	40,200	46,900	53,600	60,300	67,000
Misc. cost . Fixed	6,000	6,000	6,000	6,000	6,000
Variable	7,200	8,400	9,600	10,800	12,000
Total	83,400	91,300	99,200	1,07,100	1,15,000

(b) Budget allowance for 8,500 repair hours

= Fixed cost + Variable cost for 8,500 repair hours.

= 36,000 + (8,500 hrs. × ₹ 7.90)*

= ₹ 1,03,150.

Working Notes:

1. Employee salaries is a fixed cost and thus is the same at all levels.
2. Indirect repair material is a variable cost @ ₹ 6.70 (i.e., 40,200 ÷ 6,000) per repair hour.
3. Misc. cost is a semi-variable item. It is separated into fixed and variable components as follows:

Variable = $\dfrac{Difference\ in\ cost}{Difference\ in\ hours} = \dfrac{16,800 - 13,200}{9,000 - 6,000} = \dfrac{3,600}{3,000}$

= ₹ 1.20 per repair hour.

Fixed = [₹ 13,200 – (6,000 × ₹ 1.20)] = ₹ 6,000.

Total fixed cost = Employee salary + Misc. cost (fixed)

= 30,000 + 6,000 = ₹ 36,000

Total variable cost per hour = Indirect material + Misc. cost

= ₹ 6.70 + 1.20 = ₹ 7.90 per hour.

Ans. to Q.8

Before preparing material procurement budget, it is necessary to estimate the production during the next year. This is done as given below:

		Units
	Estimated sales	40,000
Add:	Closing stock	7,000
		47,000
Less:	Opening stock	5,000
	Estimated Production during the year	42,000

Materials Procurement Budget (Quantitative)

	A Units		B Units
Units of material required			
(@ 3 units of A and 5 units of B for ?2,000 units of production)		1,26,000	2,10,000
Closing stock required	15,000		25,000
Material on order	8,000	23,000	10,000	35,000
		1,49,000		2,45,000
ning stock	12,000		20,000
on order	7,000	19,000	11,000	31,000
		1,30,000		2,14,000

Ans. to Q.9

Production Budget for the half year ending 30-9-2006

	April units	May units	June units	July units	Aug. units	Sep. units
Estimated Sales	12,000	13,000	9,000	8,000	10,000	12,000
Add : Closing stock	6,500	4,500	4,000	5,000	6,000	7,000
	18,500	17,500	13,000	13,000	16,000	19,000
Less : Opening stock	6,000	6,500	4,500	4,000	5,000	6,000
Estimate ...uction	12,500	11,000	8,500	9,000	11,000	13,000

Raw Material Purchase Budget
For the year ending 30-9-2006

M'

April kg	May Kg	June kg	July kg	Aug. kg	Sep. kg
22,000	17,000	18,000	22,000	26,000	
17,000	18,000	22,000	26,000	26,000	
?00	35,000	40,000	48,000	52,000	
	17,000	18,000	22,000	26,000	
	18,000	22,000	26,000	26,000	
		1,...000	1,30,000	1,30,000	

'00% capacity
'00 units
Total
₹
 000

Ans. to Q.11.

Flexible Budget

	1,00,000 Units		40,000 Units		75,000 Units	
	Per Unit	Total	Per Unit	Total	Per Unit	Total
	₹	₹	₹	₹	₹	₹
Variable Cost :						
Direct Material	95	95,00,000	95	38,00,000	95	71,25,000
Direct Labour	50	50,00,000	50	20,00,000	50	37,50,000
Production Overhead	40	40,00,000	40	16,00,000	40	30,00,000
Selling Overhead = (90%)	9	9,00,000	9	3,60,000	9	6,75,000
Distribution Overhead = (80%)	12	12,00,000	12	4,80,000	12	9,00,000
Total Variable Cost	206	2,06,00,000	206	82,40,000	206	1,54,50,000
Fixed Cost						
Production Overhead	5	5,00,000	12.50	5,00,000	6.67	5,00,000
Administrative Overhead	5	5,00,000	12.50	5,00,000	6.67	5,00,000
Selling Overhead	1	1,00,000	2.50	1,00,000	1.33	1,00,000
Distribution Overhead	3	3,00,000	7.50	3,00,000	4.00	3,00,000
Total Fixed Cost	14	14,00,000	35.00	14,00,000	18.67	14,00,000
Total Cost	220	2,20,00,000	231.00	96,40,000	224.67	1,68,50,000

Ans. to Q.12.

Goldman Company Limited
Flexible Budget

Item	Capacity Levels		
	80%	90%	100%
1. Sales (units)	8,00,000	9,00,000	10,00,000
2. Selling Price (₹)	10	9.75	9.50
3. Sales (₹)	80,00,000	87,75,000	95,00,000
4. Costs			
A. Variable Costs			
Direct Materials	28,00,000	29,92,500	32,25,000
	(8,00,000 x 3.50)	(9,00,000 x 3.325)	(10,00,000 x 3.325)
Direct Labour	10,00,000	11,25,000	12,50,000
(@ ₹ 1.25 per unit)			
Direct Expenses	2,00,000	2,25,000	2,50,000
(@ Re.0.25 per unit)			
Variable Overhead :			
(Salesmen Commission	4,00,000	4,38,750	4,75,000
@ 5% of Sales Value)			
B. Semi-variable Costs :			
Supervision	80,000	84,000	88,000
Power	70,000	73,500	77,000
Heat and Light	40,000	42,000	44,000
Maintenance	50,000	52,500	55,000
Salesmen Expenses	60,000	63,000	66,000
Indirect Labour	1,00,000	1,05,000	1,10,000
Transport Costs	2,00,000	2,10,000	2,20,000
C. Fixed Costs :			
Rent and Rates	1,00,000	1,00,000	1,00,000
Depreciation	4,00,000	4,00,000	4,00,000

Advertisement		5,00,000	5,00,000	5,00,000
Sales Department		2,00,000	2,00,000	2,00,000
General		50,000	50,000	50,000
Administration				
Total Costs		7,50,000	7,50,000	7,50,000
5. Profit = (3) − (4)		70,00,000	74,11,250	79,60,000
		10,00,000	13,63,750	15,40,000

Ans. to Q.13.

Forecast Statement of Profit

1. Sales			19,00,000
2. Less : Variable Costs :			
Direct Material		4,50,000	
Add : For increase on account of sales volume (1/3 x 4,50,000)		1,50,000	
		6,00,000	
Add : Increase in price (2% of ₹ 6,00,000)		12,000	6,12,000
Direct wages		3,00,000	
Add : For increase in sales volume (1/3 of ₹ 3,00,000)		1,00,000	
		4,00,000	
Add : For increase in wage rates (5% of ₹ 4,00,000)		20,000	4,20,000
Variable Overheads		1,20,000	
Add : For increase in sales volume (1/3 x 1,20,000)		40,000	
		1,60,000	
Add : For increase in rates (5% of ₹ 1,60,000)		8,000	1,68,000
Total Variable Costs			12,00,000
3. Contribution (1) − (2)			7,00,000
4. Fixed Overheads		4,40,000	
Add : Expected Increase in fixed overheads		20,000	4,60,000
Profit			2,40,000

Ans. to Q.14.

Paints Private Ltd. Flexible Budget

	60% (24,000 units) ₹	70% (28,000 units) ₹	80% (32,000 units) ₹	90% (36,000 units) ₹
Variable cost	7,20,000	8,40,000	9,60,000	10,80,000
Semi-variable :				
Fixed	90,000	90,000	90,000	90,000
Variable	15,000	17,500	20,000	22,500
Fixed Cost	1,50,000	1,50,000	2,00,000	2,00,000
Total Cost	9,75,000	10,97,500	12,70,000	13,92,500
(a) Sales (Selling price remaining at ₹ 50)	12,00,000	14,00,000	16,00,000	18,00,000
Profit	2,25,000	3,02,000	3,30,000	4,07,500
(b) Sales (Selling price is reduced to ₹ 47.50, 5% reduction)	11,40,000	13,30,000	15,20,000	17,10,000
Profit	1,65,000	2,32,500	2,50,000	3,17,500

Ans. to Q.15.

Sales Budget for the year 2012

	Quantity (Units)	Rate	Amount
Product A			
Quarter I	1,000	₹ 30	₹ 30,000
Quarter II	2,360	₹ 30	₹ 70,800
Quarter III	2,160	₹ 30	₹ 64,800
Quarter IV	2,480	₹ 30	₹ 30,000
	8,000		₹ 2,40,000
Product B			
Quarter I	2,000	₹ 40	₹ 80,000
Quarter II	1,000	₹ 40	₹ 40,000
Quarter III	1,250	₹ 40	₹ 50,000
Quarter IV	750	₹ 40	₹ 30,000
	5,000		₹ 2,00,000

Ans. to Q. 16 :

Direct Material Purchase Budget

	Material X	Material Y
Budgeted Consumption		
→ Product A	20,000 kgs.	10,000 kgs.
→ Product B	16,000 kgs.	8,000 kgs.
	36,000 kgs.	18,000 kgs.
(+) Closing Stock of Raw Material	16,000 kgs.	4,000 kgs.
(−) Opening Stock of Raw Material	(−) 12,000 kgs.	(−) 2,000 kgs.
Budgeted Purchases	40,000 kgs.	20,000 kgs.
Purchase Price	₹ 3 / kg.	₹ 1 / kg.
Budgeted Purchase Cost	₹ 1,20,000	₹ 20,000

Computation of Budgeted Consumption

Material X

Product A = 10,000 units x 2 kgs. =	20,000 kgs.
Product B = 4,000 unis x 4 kgs. =	16,000 kgs.
	36,000 kgs.

Material Y

Product A = 10,000 units x 1 kgs. =	10,000 kgs.
Product B = 4,000 units x 2 kgs. =	8,000 kgs.
	18,000 kgs.

Ans. to Q. 17 :

Production Budget

Particulars	Product X	Product Y	Product Z
Budgeted Sales	4,800 units	2,400 units	2,400 units
(+) Closing Stock	$4,800 \times \dfrac{2}{12}$ = 800 units	$2,400 \times \dfrac{2}{12}$ =400 units	$2,400 \times \dfrac{2}{12}$ =400 units
(–) Opening Stock	(–) 600 units	(–) 300 units	(–) 800 units
Budgeted Production	5,000 units	2,500 units	2,000 units

Machine Utilisation Budget

	Units	Machine Hrs./Unit	Total Machine Hrs.
Machine A			
Product X	5,000	30	1,50,000
Product Y	2,500	200	5,00,000
Product Z	2,000	30	60,000
			7,10,000
Machine B			
Product X	5,000	70	3,50,000
Product Y	2,500	100	2,50,000
Product Z	2,000	20	40,000
			6,40,000

Ans. to Q.18 :

(1) Production Budget

Particulars	Product 1	Product 2	Product 3
Budgeted Sales	9,000 units	15,000 units	12,000 units
(+) Closing Stock	1,000 units	--	2,000 units
(–) Opening Stock		5,000 units	4,000 units
Budgeted Production	10,000 units	10,000 units	10,000 units

(2) Direct Labour Hous Budget

Operation	Product	Units	Time/Unit	Total Time
I	1	10,000	18 minsutes	3,000 hours
	:2	10,000	42 minutes	7,000 hours
	3	10,000	30 minutes	5,000 hours
				15,000 hours
			--	--
II	1	10,000	12 minutes	2,000 hours
	2	10,000	24 minutes	4,000 hours
	3	10,000		6,000 hours
			9 minutes	1,500 hours
		10,000	6 minutes	1,000 hours
III	1	10,000	--	--
	2	10,000		2,500 hours
	3			

(3) Available Labour Hours per worker per quarter

Total number of hours in a quarter (13 weeks x 6 days x 8 hours)	624 hours
(–) Hours lost due to leave, etc.	124 hours
Net available hours	500 hours

(4) Number of workers required

Operation 1 $= \dfrac{15,000 \text{ hours}}{500 \text{ hours/worker}} = 30$ workers

Operation 2 $= \dfrac{6,000 \text{ hours}}{500 \text{ hours/worker}} = 12$ workers

Operation 3 $= \dfrac{2,500 \text{ hours}}{500 \text{ hours/worker}} = \underline{5 \text{ workers}}$

$\underline{47 \text{ workers}}$

(5) Direct Labour Cost Budget

Operation	Labour Hours	Rate / Hour	Labour Cost
I	15,000	₹ 16	₹ 2,40,000
II	6,000	₹ 20	₹ 1,20,000
III	2,500	₹ 24	₹ 60,000
	23,500		₹ 4,20,000

Ans. to Q. 19 :

Production Cost Budget

Particulars	₹
Direct Materials (unchanged)	1,20,000
Direct Wages	83,333
$\left(\dfrac{₹\,80,000 \times Rs.\,2.5/hr}{₹\,3/hr}\right)$ plus 25%	•
Fixed Production Overheads	40,000
Variable Production Overheads	60,000
Budgeted Production Cost	3,03,333

Ans. to Q. 20 :

(a) Statement showing Selling Price per unit

                                                          ₹

Materials Cost
    A 10 kgs. @ ₹ 3/kg.   = 30
    B 5 kgs. @ ₹ 2/kg.   = 10   40

Labour Cost
    Machine Shop 5 hrs. @ ₹ 4   = 20
    Assembly 2 hrs. @ ₹ 5   = 10   30

Production Overheads
    Machine Shop 5 hrs. @ ₹12/hr.   = 60
    Assembly 2 hrs. @ ₹ 10/hr.   = 20   80

                    Production Cost   150

Selling Overheads (20% of Production cost)   30
                    Total Cost   180

Profit $\dfrac{1}{10}$ of Sales $\left(\dfrac{1}{9} \text{ of cost}\right)$ 20

               Selling Price/unit   200

(b) Production Budget (last quarter)

Budgeted Sales $\left(\dfrac{₹ 6,60,000}{₹ 200 \text{ / unit}}\right)$	3,300 units
(+) Closing Stock of Finished Goods	1,000 units
(−) Opening Stock of Finsihed Goods	(−) 700 units
Budgeted Production	3,600 units

(c) Rat Material Purchase Budget

Budget Consumption	Material A	Material B
Material A (3,600 units x 10 kgs.)	36,000 kgs.	
Material B (3,600 units x 5 kgs.)		18,000 kgs.
(+) Closing Stock of Raw Material	25,000 kgs.	15,000 kgs.
(−) Opening Stock of Raw Material	(−) 23,500 kgs.	(−) 13,400 kgs.
Budgeted Purchases	37,500 kgs.	19,600 kgs.
Budgeted Price/kg.	₹ 3	₹ 2
Budgeted Purchase Cost	₹ 1,12,500	₹ 39,200

(d) Production Cost Budget

	₹
Raw Material Cost	
Material A 3,600 units x ₹ 30/unit	1,08,000
Material B 3,600 units x ₹ 10/unit	36,000
Labour Cost	
Machine Shop 3,600 units x ₹ 20/unit	72,000
Assembly 3,600 units x ₹ 10/unit	36,000
Production Overheads	
Machine Shop 3,600 units x ₹ 60/unit	2,16,000
Assembly 3,600 units x ₹ 20/unit	72,000
Production Cost	5,40,000
Selling Overheads 3,600 units x ₹ 30/unit	1,08,000
Budgeted Total Cost	6,48,000

Note : The "Closing Balance" information of third quarter is "Opening Balance" informationin context of fourth quarter.

MARGINAL COSTING

Q.1. Compute P/V ratio in the following cases :
- a) S.P. Per unit = ₹ 18
  Variable cost per unit = ₹ 12
- b) Total sale of 1,000 units = ₹ 60,000
  Variable cost = ₹ 45 per unit
- c) Total sales = ₹ 5,00,000
  Fixed costs = ₹ 1,00,000
  Capital invested = ₹ 7,50,000
  Desired profit = 20% of capital employed
- d)

	First Year (₹)	Second Year (₹)
Sales	80,000	90,000
Profits	10,000	14,000

Q.2. P/V ratio of a firm is 40%, what are the various conclusions you can draw.

Q.3. Calculate B.E.P. in units and in value if variable cost per unit ₹ 12 selling price per unit ₹ 18, fixed expenses ₹ 60,000.

Q.4. Calculate B.E.P. in units from the following :

Fixed Expenses :

Depreciation	₹ 1,00,000
Salaries	₹ 1,00,000

Variable Expenses :

Material	₹ 3 per unit
Labour	₹ 2 per unit
Selling price	₹ 10 per unit

Also calculate new B.E.P. (in value) if the selling price is reduced by 10%.

Q.5. Fixed expenses ₹ 3,00,000
Variable cost per unit ₹ 75
Selling price per unit ₹ 100

Calculate :

(i) B.E.P.
(ii) Selling price per unit if B.E.P. is brought down to 10,000 units.

Q.6. Sales ₹ 4,00,000
Fixed cost ₹ 1,80,000
Variable cost ₹ 2,50,000

Compute the incremental amount of sales in order to break-even.

Q.7. Fixed cost ₹ 8,000, Profit ₹ 2,000, B.E.P. ₹ 40,000. Find actual sales.

Q.8. A company sell four products A, B, C and D.
Total sales are ₹ 60,000 which is divided in A, B, C and D in 33 1/3%, 41 2/3%, 16 2/3% and 8 1/3% respectively. Variable cost are 60%, 68%, 80% and 40% of selling price of A, B, C and D respectively. Fixed cost ₹ 14,700. Calculate composite B.E.P.

Q.9.

Product	S.P. Per Units ₹	V.C. Per Units ₹	% of Rupees Sale Volume
X	4	3	20
Y	5	4	40
Z	8	6	40

Capacity : ₹ 15,00,000 total sales volume
Annual fixed cost ₹ 2,30,000.

Find : (i) Composite B.E.P. (in value)
(ii) Profit at 80% of capacity.

Q.10. M Ltd. Manufactures three products P, Q and R. The unit selling prices of these products are ₹ 100; ₹ 80 and ₹ 50 respectively. The corresponding unit variable costs are ₹ 50, ₹ 40 and ₹ 20. The proportions (quantity-wise) in which these products are manufactured and sold are 20%, 30% and 50% respectively. Total fixed costs are ₹ 14,80,000.

Given the above information, you are required to work out the over all break-even quantity and the product-wise break-up of such quantity.

Q.11. Fixed costs ₹ 4,500;
Total variable costs ₹ 7,500
Sales = ₹ 15,000.
Calculate (i) Margin of Safety; (ii) M.S. Ratio (percentage).

Q.12. M.S. 40%, B.E.P. ₹ 48,000
Fixed cost ₹ 15,000; Profit ₹ 10,000
Compute P/V ratio with and without using M.S. Ratio.

Q.13. Sales ₹ 6,00,000
Variable costs ₹ 3,75,000; Fixed cost ₹ 1,80,000
Calculate sales to earn profit of ₹ 1,20,000.

Q.14. Sales are 200 units at ₹ 10 per unit. Fixed overheads ₹ 300, Variable cost ₹ 6 per unit. There is a proposal to reduce selling price by 10%. Calculate present and future P/V ratio and find units to be sold in future to maintain present profit.

Q.15. A company has a P/V ratio of 40%. By what percentage must sales quantity be increased to off set 15% reduction in selling price.

Q.16. Selling price per unit ₹ 20
Variable cost per unit ₹ 14
Fixed cost ₹ 7,92,000

Required :
(i) B.E.P.; (ii) Number of unit to be sold for a profit of ₹ 60,000; (iii) Number of units to be sold to earn a profit of 10% of sales.

Q.17. Fixed expenses ₹ 4,000 and B.E.P. ₹ 10,000
Calculate (i) P/V ratio; (ii) Profit when sales are ₹ 20,000; (iii) Sales for profit of ₹ 20,000; (iv) New B.E.P., if selling price is reduced by 20%.

Q.18. Fixed Cost = ₹ 1,80,000
Variable Cost = ₹ 2 per unit
Selling Price = ₹ 20 per unit

Calculate (i) B.E.P. (in value); (ii) Sales for a profit of ₹ 36,000; (iii) M.S. if company is earning profit of ₹ 36,000.

Q.19.

	Year	
	2011	**2012**
Sales (₹)	8.10,000	10.26,000
Profit (₹)	21,600	64,800

Calculate : (i) P/V ratio; (ii) Fixed cost (it remains same in both the years); (iii) Profit when sales are ₹ 6,48,000; (iv) Sales to earn profit of ₹ 1,08,000; (v) M.S. if the company earns profit of ₹ 1,08,000.

Q.20. Sales 4,000 units @ ₹ 25 per unit

		1,00.000
Material consumed	40,000	
Variable overheads	10,000	
Labour	20,000	
Fixed overheads	18,000	88,000
Net Profit		12,000

Calculate :
1. B.E.P.
2. Units to be sold for profit of 20% on sales.
3. Extra units to be sold to maintain the profit if selling price is reduced by 25%
4. Selling price per unit if B.E.P. is brought down to 500 units.

Q.21. A Coaching centre decides to conduct a test for which ₹ 100 is charged from each participant. The cost incurred in connection with paper checking is ₹ 60 per participant. Also, a supervisor is appointed who is paid ₹ 400 for this job. He is supposed to supervise maximum number of 100 students. Compute break-even number of participants if fixed cost is ₹ 40,000.

Q.22. P/V Ratio is 50% M/S ratio is 40% and sales are ₹ 50 lakhs. Compute B.E.P. and net profit.

Q.23. The executive of B Co., a small manufacturer of one product are developing the annual profit plan. They are concerned with the ₹ 1,10,000 indicated profit on a sales volume of 20,000 units. The fixed cost structure of ₹ 9,90,000 appears to be high and they have some doubts about departing from the units sales price of ₹ 100. There is a general agreement that the profit target should be ₹ 2,20,000.

You are required to compute :
(a) The break even point in rupees and in units and the number of units that would have to be sold to earn the target profit.
(b) You are also required to respond directly to each of the following two alternatives under consideration by the management.

Alternative 1 : A sale price increase of 20% is contemplated, the sales executive estimates that this will cause a drop in units that can be sold by 15%. What would be the new break-even point in rupees and in units ? What would be the new profit figure? How many units would have to be sold to earn target profit ?

Alternative 2 : A decrease in fixed costs of ₹ 55,000 and a decrease of variable costs of 6% are contemplated. What would be the new BEP in rupees ? How many units must be sold to earn the target profit ?