6. STANDARD COSTING

PROBLEM NO: 1

	Standard			Actuals		
Material	SQ	SP	SQ x SP	AQ	AP	AQ x AP
	50	1	50	45	0.8	36

M.C.V = SQ x SP – AQ x AP = 50 – 36 = 14(F)

PROBLEM NO: 2

	Standard (80tonnes)			Actuals (80tonnes)			
Material	SQ	SP	SQ x SP	AQ	AP	AQ x AP	AQ x SP
	[for 1 Ton - 30 units; for 80 Tonnes - ?] 2400units	2.5	6,000	2,500units	3 (9000/3000)	7,500	62,500

Actual Quantity of R/M consumed

= Opening Stock R/M + Purchase of R/M – Closing stock of R/M

= Nil + 3000 units – 500 unit

= 2500 units

M.C.V = SQ x SP – AQ x AP = Rs.6,000 – Rs.7,500 = Rs.1500 (A)

M.P.V = AQ x SP – AQ x AP = Rs.6,250 – Rs.7,500 = Rs.1250 (A)

M.U.V = SQ x SP – AQ x SP = Rs.6,000 – Rs.6,250 = Rs.250 (A)

PROBLEM NO: 3

	Standard (2,10,000 kg)			Actuals (2,10,000 kg)			
Material	SQ	SP	SQ x SP	AQ	AP	AQ x AP	AQ x SP
	[For 70kg output - 100kg r/m; For 2,10,000kg output - ?] 3,00,000 kg	1	3,00,000	2,80,000	0.9 (2,52,000/2,80,000)	2,52,000	2,80,000

M.U.V = SQ x SP – AQ x SP

= Rs.3,00,000 – (Rs.2,80,000 x 1)

= Rs.20,000 (F)

M.P.V = AQ x SP – AQ x AP

= Rs.2,80,000 – Rs.2,52,000 = Rs.28,000(F)

M.C.V = SQ x SP – AQ x AP

= Rs.3,00,000 – Rs.2,52,000 = Rs.48,000(F)

PROBLEM NO: 4

	Standards (365kg)				Actual (365kg)				
Particulars	**SQ**	**SP**	**SQ x SP**	**AQ**	**AP**	**AQ x AP**	**AQ x SP**	**RSQ**	**RSQ x SP**
Mat A (35%)	134	25	3350	125	27	3375	3125	140	3500
Mat B (65%	250	36	9000	275	34	9350	9900	260	9360

Input	384 kg		12350	400 kg		12725	13025	400 kg	12860
Loss (5%)	19		35						
Out put	365		365						

M.C.V = SQ x SP – AQ x AP

= Rs.12350 – Rs.12725 = Rs.375 (A)

M.P.V = AQ x SP – AQ x AP

= Rs.13025 – Rs.12725 = Rs.300 (F)

M.M.V = RSQ x SP – AQ x SP

= Rs.12860 – Rs.13025 = Rs.165 (A)

M.Y.V = SP x SQ – RSQ x SP

= Rs.12350 – Rs.12,860 = Rs.510 (A)

PROBLEM NO: 5

	Standards (20,000kg)				Actual (20,000kg)				
Particulars	SQ	SP	SQ x SP	AQ	AP	AQ x AP	AQ x SP	RSQ	RSQ x SP
P	9000	20	1,80,000	10,000	19	190000	200000	9409	188180
Q	8000	40	320000	8500	42	357000	340000	8364	334560
R	5000	60	300000	4500	65	292500	270000	5227	313620
	22000		800000	23000		839500	810000	23000	836310

Calculation of standard quantity of R/M required for actual output.

$$R/M-P=\begin{pmatrix}\text{for } 1000\,kg-450\,kg\\ \text{for } 2000\,kg-?\end{pmatrix}=\frac{20{,}000\times 450}{1000}=9000\,kg$$

$$R/M-Q=\begin{pmatrix}\text{for } 1000\,kg-400\,kg\\ \text{for } 20{,}000\,kg-?\end{pmatrix}=\frac{20000\times 400}{1000}=8000\,kg$$

$$R/M-R=\begin{pmatrix}\text{for } 1000\,kg-250\,kg\\ \text{for } 20{,}000\,kg-?\end{pmatrix}=\frac{20{,}000\times 250}{1000}=5000\,kg$$

M.C.V = SQ x SP – AQ x AP = Rs.800000 – Rs.839500 = Rs.39500 (A)

M.P.V = AQ x SP – AQ x AP = Rs.810000 – Rs.839500 = Rs.29500 (A)

M.U.V = SQ x SP – AQ x SP = Rs.800000 – Rs.810000 = Rs.10000 (A)

M.M.V = RSQ x SP – AQ X SP = Rs.836360 – Rs.810000 = Rs.26,360 (F)

M.Y.V = SQ x SP – RSQ x SP = Rs.800,000 – Rs.836360 = Rs.36360 (A)

PROBLEM NO: 6

	Standards (500 mt)				Actual (500 mt)			
	SQ	SP	SQ x SP	AQ	AQ x AP	AQ x SP	RSQ	PSQ x SP
Lime stone	325 (65% of500)	565	183625	340	190400	192100	340	192100 65% = 525
Silica	100 (20% of 500)	4800	480000	105	509250	504000	105	504000 20% of 523
Aluminum	25 (5% 500)	32100	802500	25	812500	802500	26	834600 5% 9523

Iron-ore	25 (5% of 500)	1800	45000	30	53400	54000	26	46800 5% of 523
Other	25 (5% of 500)	2400	60000	23	51750	55200	26	62400 5% of 523
	500	41665	1571125	523	1617300	1607800	523	1639900

(i) M.C.V = SQ x SP – AQ x AP

= Rs.15,71,125 – Rs.16,17,300 = Rs.46,175 (A)

(ii) M.P.V = AQ x SP – AQ x AP

= Rs.16,07,800 – Rs.16,17,300 = Rs.9500 (A)

(iii) M.M.V = RSQ x SP – AQ x SP

= Rs.1639900 – Rs.1607800 = Rs.32100 (F)

(iv) M.Y.V = SQ x SP – RSQ x SP

= Rs.1571125 – Rs.1639900 = Rs.68775 (A)

(v) M.C.V = SQ x SP – AQ x AP

= Rs.15,71,125 – Rs.16,17,300 = Rs.4,6175 (A)

Note: Calculations are made to nearer rupee

PROBLEM NO: 7

	Standards (1000kg)				Actual (1000kg)			
	SQ	**SP**	**SQ x SP**	**AQ**	**AP**	**AQ x AP**	**AQ x SP**	**RSQ**
R/M A	800 kg (for 10 kg – 8 kg Out put R / q for 1000 – ?)	6	4800	750	7	5250	4500	833
R/M B	400 kg (for 10 kg – 4 kg a R/M for 1000 – ?)	4	1600	500	5	2500	2000	417
	1200 kg		6400	1250 kg		7750	6500	1250 kg

M.C.V. = SQ x SP – AQ x AP

= Rs.6400 – Rs.7750 = Rs.1350 (A)

M.P.V = AQ x SP – AQ x AP

= Rs.6500 – Rs.7750 = Rs.1250 (A)

M.U.V = SQ x SP – AQ x SP

= Rs.6400 – Rs.6500 = Rs.100 (A)

PROBLEM NO: 8

i) Material Cost Variance = Standard Cost – Actual Cost

Or = SP x SQ – AP x AQ

A = (Rs.12,000 x 18 tonne x 0.74) – Rs.1,62,000 = Rs.2,160 (A)

B = (Rs.23,500 x 18 tonne x 0.40) – Rs.1,65,200 = Rs.4,000 (F)

C = (Rs.18,000 x 18 tonne x 0.64) – Rs.2,07,000 = Rs. 360 (F)

= Rs.2,200 (F)

ii) Material Price Variance = Actual Quantity (Std. Price – Actual Price)

Or = AQ x SP – AQ x AP

A = (13.12 tonne x Rs.12,000) – Rs.1,62,000

= Rs.1,57,440 – Rs.1,62,000 = Rs.4,560 (A)

B = (7.1 tonne x Rs.23,500) – Rs.1,65,200

= Rs.1,66,850 – Rs.1,65,200 = Rs.1,650 (F)

C = (11.5 tonne x Rs.18,000) – Rs.2,07,000

= Rs.2,07,000 – Rs.2,07,000 = Nil

= Rs.2,910 (A)

iii) Material usage Variance = Std. Price (Std. Quantity – Actual Quantity)

Or = SP x SQ – SP x AQ

A = (Rs.12,000 x 18 tonne x 0.74) – (Rs.12,000 x 13.12 tonne)

= Rs.1,59,840 – Rs.1,57,440 = Rs.2,400 (F)

B = (Rs.23,500 x 18 tonne x 0.40) – (Rs.23,500 x 7.10 tonne)

= Rs.1,69,200 – Rs.1,66,850 = Rs.2,350 (F)

C = (Rs.18,000 x 18 tonne x 0.64) – (Rs.18,000 x 11.5 tonne)

= Rs.2,07,360 – Rs.2,07,000 = Rs.360 (F)

= Rs.5,110 (F)

iv) Material Mix Variance = Std. Price (Revised Std. Quantity – Actual Quantity)

Or = SP x RSQ – SP x AQ

A = $\left(\text{Rs.12,000} \times 31.72\,\text{tonne} \times \frac{0.74}{1.78}\right) - (\text{Rs.12,000} \times 13.12\,\text{tonne})$

= Rs.1,58,243.6 – Rs.1,57,440 = Rs.803.60 (F)

B = $\left(\text{Rs.23,500} \times 31.72\,\text{tonne} \times \frac{0.40}{1.78}\right) - (\text{Rs.23,500} \times 7.10\,\text{tonne})$

= Rs.1,67,510.11 – Rs.1,66,850 = Rs.660.11 (F)

C = $\left(\text{Rs.18,000} \times 31.72\,\text{tonne} \times \frac{0.64}{1.78}\right) - (\text{Rs.18,000} \times 11.5\,\text{tonne})$

= Rs.2,05,288.99 – Rs.2,07,000 = Rs.1,711.01 (A)

v) Material Yield Variance = Std. Price (Std. Quantity – Revised Std. Quantity)

A = (Rs.12,000 x 18 tonne x 0.74) $\left(\text{Rs.12,000} \times 31.72\,\text{tonne} \times \frac{0.74}{1.78}\right)$

= Rs.1,59,840 – Rs.1,58,243.60 = Rs.1,596.40 (F)

B = (Rs.23,500 x 18 tonne x 0.40) - $\left(\text{Rs.23,500} \times 31.72\,\text{tonne} \times \frac{0.40}{1.78}\right)$

= Rs.1,69,200 – Rs.1,67,510.11 = Rs.1,689.89 (F)

C = (Rs.18,000 x 18 tonne x 0.64) - $\left(\text{Rs.18,000} \times 31.72\,\text{tonne} \times \frac{0.64}{1.78}\right)$

= Rs.2,07,360 – Rs.2,05,288.99 = Rs.2,071.01 (F)

= Rs.5,357.30 (F)

PROBLEM NO: 9

	Stand (90kg)				Actual (90kg)					
		SQ	SP	SQ x SP	AQ	AP	AQ x AP	AQ x SP	RSQ	RSQ x SP
Chemical	A (50%)	50	12	600	X	15	15X	12X	$\frac{x+70}{2}$	6x+420
Chemical	B (50%)	50	15	750	70	y	70y	1050	$\frac{x+70}{2}$	7.5x+525
Input		100		1350	X+70		15x+70y	12x+1050	x + 70	13.5x + 945
Loss (10%)		10								
Output 90%)		90								

M.Y.V = SQ x SP – RSQ x SP

-135 = 1350 – 13.5x – 945

13.5 X = 540

X = 540/13.5 =40

- Actual Input of chemical A = 40 kg

  M.C.V = SQ x SP – AQ x AP

  - 650 = 1350 – 15 (40) – 70y

  70y = 1350 – 600 + 650

  Y = 1400/70

  = Rs. 20.

- Actual price per kg of chemical B : Rs. 20

  (a) M.M.V = RSQ X SP – AQ x SP

  = Rs.13.5 (40) + Rs.945 – Rs.12(40) - Rs.1050

  = Rs.1485 – Rs.480 – Rs.1050

  = Rs.45 (A)

  (b) M.U.V = SQ x SP – AQ x SP

  = Rs.1350 – Rs.12(40)- Rs.1050

  = Rs.180 (A)

  (c) M.P.V = AQ x SP – AQ x AP

  = Rs.12(40) + Rs.1050 - Rs.15(40) – Rs.70(20)

  = Rs.480 + Rs.1050 – Rs.600 – Rs.1400

  = Rs.470 (A)

  (d) Actual loss of actual Input :-

Actual Input = 40+70 =	110 kg
Less : Act out put =	90 kg
Actual Loss =	20 kg

  (e) Actual Input of Chemical A = 40 kg

  (f) Actual price per kg of Chemical B = Rs.20

PROBLEM NO: 10

R/M - B

Standard			Actuals			
SQ	SP	SQ x SP	AQ	AP	AQ x AP	AQ x SP
50	15	750	70	20	1400	1050

1. M.U.V = SQ x SP – AQ x SP

   - Rs.300 = SQ x 15 – 1050

   SQ = $\frac{1050-300}{15} = Rs.50$

   - Standard Quantity of R/M B = 50kg

2. M.P.V = AQ x SP – AQ x AP

   = Rs.1050 – Rs.1400 = Rs.350 (A)

3. M.C.V = SQ x SP – AQ x AP

   = Rs.750 – Rs.1400 = Rs.650 (A)

Mix of R/M A & R/MB:

	Standard			Actuals					
Particulars	SQ	SP	SQ x SP	AQ	AP	AQ x AP	AQ x SP	RSQ	RSQ x SP
R/MA:	50	12	600	X	15	15x	12x	$\frac{x+70}{2}$	6x+420
R/MB:	50	15	750	70	20	1400	1050	$\frac{x+70}{2}$	7.5X+525
	100		1350	X+70		15x + 1400	12x + 1050	X+70	13.5x + 945

M.M.V = RSQ x SP – AQ x SP

- 45 = 13.5X + 945 – 12X – 1050.

105 – 45 = 1.5X

$X = \frac{60}{1.5} = 40kg$

- Actuals Quantity of R/M A = 40 kg

R/M A:

Standard			Actuals			
SQ	SP	SQ x SP	AQ	AP	AQ x AP	AQ x SP
50	12	600	40	15	600	480

M.P.V = AQ x SP – AQ x AP = Rs.480 – Rs.600 = Rs.120 (A)

M.U.V = SQ x SP – AQ x SP = Rs.600 – Rs.480 = Rs.120 (F)

M.C.V = SQ x SP – AQ x AP = Rs.600 – Rs.600 = Rs.0

PROBLEM NO:11

	Standard (2000 Articles)			Actual (2000 Articles)					
	SH	SR	SH x SR	AH	AR	AH x AR	AH x SR	RSH	RSH x SR
Men	3000	4	12000	2500	4.5	11250	10,000	3,000	12000
Women	1200	3	3600	1800	3	5400	5400	1,200	3600
Boys	400	2	800	300	2	600	600	400	800
	4600		16400	4600		17250	16000		16400

Calculation of Standard hours for actual output

Men - $\begin{pmatrix}\text{For 1000 unit} - 1500\text{hr}\\ \text{For 2000 unit} - ?\end{pmatrix}$ $= 3000\text{hr}$

Women - $\begin{pmatrix}\text{For 1000 units} - 600\text{hr}\\ \text{For 2000 units} - ?\end{pmatrix}$ $= 1200\text{hr}$

Boys - $\begin{pmatrix}\text{For 1000 units} - 200\text{hr}\\ \text{for 2000 untis} - ?\end{pmatrix}$ $= 400\text{hr}$

L.C.V = SH x SR – AH x AR = Rs.16400- Rs.17250 = Rs.850 (A)

L.R.V = AH x SR – AH x AR = Rs.16000 – Rs.17250 = Rs.1250 (A)

L.E.V = SH x SR – AH x SR = Rs.16400 – Rs.16000 = Rs.400 (F)

L.M.V = RSH X SR – AH X SR = Rs.16400- Rs.16000 = Rs.400 (F)

L.Y.V = SH x SR – RSH x SR = Rs.16400 - Rs.16400 = NIl

PROBLEM NO: 12

Standard			Actuals			
SH	SR	SH x SR	AH	AR	AH x AR	AH x SR
1000	0.5	500	900	0.4	360	450

L.C.V = SH x SR – AH x AR

= Rs.500 – Rs.360 = Rs.140 (F)

L.E.V = SH x SR – AH x SR

= Rs.500 – Rs.450 = Rs.50 (F)

L.R.V = AH x SR – AH x AR

= Rs.450 – Rs.360 = Rs.90 (F)

PROBLEM NO: 13

Calculation of Standard hours for Allowed for actual output

skilled - $\begin{pmatrix}\text{For 2000 units} - 65 \times 40\text{hr}\\ \text{For 1800 units} - ?\end{pmatrix}$ $= \frac{2600 \times 1800}{2000} = 2340\text{hr}$

Semi skilled - $\begin{pmatrix}\text{For 2000 units} - 20 \times 40\text{hr}\\ \text{For 1800 units} - ?\end{pmatrix}$ $= \frac{1800 \times 800}{2000} = 720\text{hr}$

Unskilled - $\begin{pmatrix}\text{For 2000 units} - 15 \times 40\text{hr}\\ \text{For 1800 units} - ?\end{pmatrix}$ $= \frac{1800 \times 600}{2000} = 540\text{hr}$

Actuals hours paid to produce 1800 units.

Skilled = 50 X 40 hr = 2000 hr

Semiskilled = 30 x 40 hr = 1200 hr

Unskilled = 20 x 40 hr = 800 hr.

Actuals hours worked to produce 1800 units.

Skilled = 2000 hr – 50 x 2 = 1900 hr

Semiskilled = 1200 hr – 30 x 2 = 1140 hr

Un skilled = 800 hr – 20 x 2 = 760 hr

	Standard			Actuals					
Particulars	SH	SR	SH x SR	AH	AR	AH x AR	AH x SR	APH	APH x SR
Skilled	2340	45	1,05,300	2000	50	1,00,000	90,000	1900	85,500
Semiskilled	720	30	21,600	1200	35	42000	36000	1140	34200
Unskilled	540	15	8,100	800	10	8000	12000	760	11,400
			1,35,000			**150,000**	**1,38,000**		**1,31,100**

Calculation of Variances

(i) Labour Cost Variance = Standard Cost for actual output – Actual cost

Skilled worker = Rs.1,05,300 - Rs.1,00,000

= Rs. 5,300 (F)

Semi-skilled worker = Rs. 21,600 - Rs. 42,000

= Rs. 20,400 (A)

Unskilled Worker = Rs. 8,100 - Rs. 8,000

= Rs.100 (F)

Total = Rs.5,300 (F) + Rs.20,400 (A) + Rs.100 (F)

= Rs.15,000 (A)

(ii) Labour Efficiency Variance = Std. Rate x (Standard hours – Actual hours worked)

Skilled worker = Rs. 45 x (2,340 hrs. - 1,900 hrs.)

= Rs.19,800 (F)

Semi-skilled worker = Rs. 30 x (720 hrs. - 1,140 hrs.)

= Rs. 12,600 (A)

Unskilled Worker = Rs. 15 x (540 hrs. - 760 hrs.)

= Rs. 3,300 (A)

Total = Rs.19,800 (F) + Rs.12,600 (A) + Rs.3,300 (A)

= Rs.3,900 (F)

(iii) Labour Idle Time Variance = Std. Rate x Idle Time (Hrs.)

Skilled worker = Rs. 45 x 100 hrs.

= Rs. 4,500 (A)

Semi-skilled worker = Rs. 30 x 60 hrs.

= Rs. 1,800 (A)

Unskilled worker = Rs. 15 x 40 hrs.= Rs. 600 (A)

Total = Rs. 4,500 (A) + Rs. 1,800 (A) + Rs. 600 (A)

= Rs. 6,900 (A)

PROBLEM NO: 14

Material Variances

(SQ × SP)	RS.	(AQ × AP)	RS.	(AQ × SP)	RS.
A-3,000 ×1,000	= 30,00,000	3,400 ×1,100	= 37,40,000	3,400 ×1,000	= 34,00,000
B-2,400 × 800	= 19,20,000	2,300 × 700	= 16,10,000	2,300 × 800	= 18,40,000
C- 500 ×4,000	= 20,00,000	600 × 3,900	= 23,40,000	600 × 4,000	= 24,00,000
D-100×30,000	= 30,00,000	90 × 31,500	= 28,35,000	90 × 30,000	= 27,00,000
Total	99,20,000		1,05,25,000		1,03,40,000

(a) Material Cost Variance (MCV) = (SQ × SP) – (AQ × AP)

= RS.99, 20,000 – RS.1, 05, 25,000 = RS.6, 05,000 (A)

(b) Material Price Variance (MPV) = AQ (SP – AP) or (AQ × SP) – (AQ × AP)
= RS.1, 03, 40,000 – RS.1,05, 25,000 = RS.1,85,000 (A)

(c) Material Usage Variance (MUV) = (SQ × SP) – (AQ × SP)
= RS.99, 20,000 – RS.1,03, 40,000 = RS.4,20,000(A)

Verification, MCV = MPV + MUV
Or, RS. 6,05,000 (A) = RS.1,85,000 (A) + RS.4,20,000 (A)
Or, RS.6,05,000 (A) = RS.6,05,000 (A)

Labour Variances

(SH × SR)	RS.	(AH× AR)	RS.	(AH× SR)	RS.
L1 –60,000 × 15	= 9,00,000	56,000 × 18	= 10,08,000	56,000 ×15	= 8,40,000
L2 – 40,000 × 30	= 12,00,000	38,000 × 35	= 13,30,000	38,000 × 30	= 11,40,000
Total	**21,00,000**		**23,38,000**		**19,80,000**

(a) Labour Cost Variance (LCV) = (SH × SR) – (AH × AR)
= Rs.21,00,000 – Rs.23,38,000 = Rs.2,38,000 (A)

(b) Labour Rate Variance (LRV) = (AH × SR) – (AH × AR)
= Rs.19,80,000 – Rs.23,38,000 = Rs.3,58,000 (A)

(c) Labour Efficiency Variance (LEV) = (SH × SR) – (AH × SR)
= Rs. 21,00,000 – Rs.19,80,000 = Rs.1,20,000 (F)

Verification, LCV = LRV + LEV
Or, RS.2,38,000 (A) = Rs.3,58,000 (A) + Rs.1,20,000 (F)
Or, RS.2,38,000 (A) = Rs. 2,38,000 (A)

PROBLEM NO: 15

Dept - A

SR × SH (1)	SR × RSH (2)	SR × AH (3)	AR × AH (4)
Rs.0.30 × 8,000	-	Rs.0.30 × 8,200	-
Rs.2400	-	**Rs.2460**	**Rs.2,000**

Labour Cost Variance = (1) – (4) = 400 (F)
Labour Rate Variance = (3) – (4) = 460 (F)
Labour Efficiency Variance = (1) –(3) = 60 (A)

Dept-B

SR × SH **(1)**	SR × RSH **(2)**	SR × AH **(3)**	AR × AH **(4)**
Rs.0.35 × 6,000	-	Rs.0.30 × 5800	-
Rs.2100	-	**Rs.2030**	**Rs.1800**

Labour Cost Variance = (1) – (4) =300 (F)
Labour Rate Variance = (3) – (4) =230 (F)
Labour Efficiency Variance = (1) –(3) =70 (F)

PROBLEM NO: 16

Efficiency Ratio can be obtained by dividing the activity ratio by capacity ratio as follows:-

$$\text{Efficiency Ratio} = \frac{\text{Activity ratio}}{\text{Capacity ratio}} \times 100$$

$$= \frac{104\%}{96\%} \times 100 = 108.33\%$$

The inter – relationship is shown below:

$$\text{Activity Ratio} = \frac{\text{Std.hours for actual production}}{\text{Budgeted Hours}} \times 100$$

$$\text{Capacity ratio} = \frac{\text{Actual Working hours}}{\text{Budgeted Hours}} \times 100$$

$$\text{Efficiency ratio} = \frac{\text{Std.hours for actual production}}{\text{Actual hours worked}} \times 100$$

$$\text{i.e. Efficiency Ratio} = \frac{\text{Activity ratio}}{\text{Capacity ratio}}$$

$$= \frac{\text{Std.hours for actual production}}{\text{Budgeted Hours}} \times \frac{\text{Budgeted Hours}}{\text{Actual hours worked}} \times 100$$

$$= \frac{\text{Std.hours for actual production}}{\text{Actual hours worked}} \times 100$$

Activity Ratio = Capacity Ratio × Efficiency Ratio

PROBLEM NO: 17

$$\text{Efficiency Ratio} = \frac{\text{Actual output in terms of standard hours}}{\text{Actual hour worked}} \times 100$$

$$\text{or,} \frac{60 \text{ units} \times 8 \text{ hours}}{500 \text{ hours}} \times 100 \qquad \text{or,} \frac{480 \text{ hours}}{500 \text{ hours}} \times 100 = 96\%$$

$$\text{Capacity Ratio} = \frac{\text{Actual hours worked}}{\text{Budgeted Hours}} \times 100$$

$$\text{or,} \frac{500 \text{ hours}}{80 \text{ units} \times 8 \text{ hours}} \times 100 \qquad \text{or,} \frac{500 \text{ hours}}{640 \text{ hours}} \times 100 = 78.12\%$$

PROBLEM NO: 18

Calculation of Fixed OH Variance:

(1)	(2)	(3)	(4)	(5)
SR X SH	**SR X AH**	**SR X RBH**	**SR X BH**	**AR X AH**
1.50 X 22,000	-	-	1.50 X 20,000	31,000 (given)
33,000			30,000	

WORKING:

(1) SR = Fixed OHRR per unit

$$= \frac{30,000}{20,000} = \text{Rs. } 1.50 \text{ per unit}$$

Variances:

(i) FOH Volume Variance = (1) – (4) = 3,000 (F)

(ii) FOH Expenditure Variance = (4) – (5) = 1,000 (A)

(iii) FOH Cost Variance = (1) – (5) = 2,000 (F)

PROBLEM NO: 19

FOH Variances

SH x SR	AHW x SR (or) AHW x BR	RBH x SR (or) RBH x BR	BH x SR (or) BH x BR	AHW x AR
21,000 x 0.5	22,000 x 0.5	20,000 x 0.5	20,000 x 0.5	22,000 x 0.54
Rs.10,500	Rs.11,000	Rs.10,000	Rs.10,000	Rs.12,000

SR = BR = $\frac{BOH}{BH} = \frac{10,000}{20,000}$ = Rs.0.5

BH = 2000 x 10 = 20,000 hrs

SH = 2,100 x 10 = 21,000 hrs

$\begin{pmatrix} 1unit & - & 10hr \\ 2,100 & - & ? \end{pmatrix}$

AR = $\frac{AOH}{AH} = \frac{12,000}{22,000}$ = Rs.0.54

RBH = BH = 20,000 hrs

1. FOH cost variance = SH x SR – AH x AR = 10,500 – 12,000 = Rs.1,500 (A)
2. FOH exp. variance = BH x SR - AH x AR = 10,000 – 12,000 = Rs.2,000 (A)
3. FOH volume variance = SH x SR – BH x SR = 10,500 – 10,000 = Rs.500 (F)
4. FOH Capacity variance = AH x SR – RBH x SR = 11,000 – 10,000 = Rs.1,000 (F)
5. FOH efficiency variance = SH x SR – AH x SR = 10,500 – 11,000 = Rs.500 (A)

PROBLEM NO: 20

FOH VARIANCES: HOURS BASIS

SH × BR (1)	AHW × BR (2)	RBH × BR (3)	BH × BR (4)	AHW × AR (5)
166320 × 5	184800 × 5	176000 × 5	160000 × 5	184800 × 4.5
831600	924000	880000	800000	840000

BR = $\frac{BOH}{BH} = \frac{800000}{160000} = 5.00hr.$

AR = $\frac{AOH}{AHW} = \frac{840000}{184800} = 4.54\,hr.$

RBH = $\frac{Ad}{Bd} \times BH = \frac{22}{20} \times 160000$ =176000 hr.

FOH Eff Variances 1-2 = 92400 A
FOH Capacity Variances 2-3 = 44000 F
FOH Cal Variances 3-4 = 80000 F
FOH Volume Variances 1-4 = 31600 F
FOH Exp Variances 4-5 = 40000 A
FOH Cost Variances 1-5 = 8400 A

Variable OH variances – not given

PROBLEM NO:21

Production volume variance

Standard fixed overheads per unit : Rs. 3,000 (Given)

Actual production : 100 units

Standard production (capacity) : 200 units

Unabsorbed units : 100 units (200 – 100)

Production volume variance : Rs. 3,000 × 100 units

= Rs. 3,00,000 (Adverse)

Overhead expenses variance

Standard fixed overheads for actual production : Rs. 6,00,000

Standard variable overheads for actual production : Rs. 1,500 × 100 units

= Rs. 1,50,000

Std total overheads for actual production : Rs. 7,50,000

Actual overheads : Rs. 11,50,000

Overhead expense variance : Rs. 4,00,000 (Adverse)

PROBLEM NO: 22

Calculation of FOH Variances:

(1)	(2)	(3)	(4)	(5)
SR X SH	**SR X AH**	**SR X RBH**	**SR X BH**	**AR X AH**
1 X 1,53,090	1 X 1,70,100	1 X 1,62,000	1,50,000 (Given)	1,56,000 (Given)
= 1,53,090	1,70,100	1,62,000		

Working note:

(1) SR $= \frac{\text{Budgeted OH}}{\text{Budgeted hrs}} = \frac{1,50,000}{(25 \text{ days X } 6,000)}$ = Rs. 1 per hour

(2) RBH = BH for actual days worked

$= 1,62,000 \begin{bmatrix} 25 \text{ days} & - & 1,50,000 \\ 27 \text{ days} & - & ? \end{bmatrix}$

Variances:

FOH Expenditure Variance = (4) – (5) = 6,000 (A)

FOH Volume Variance = (1) – (4) = 3,090 (F)

FOH Cost Variance = (1) – (5) = 2,910 (A)

PROBLEM NO: 23

Basic calculation:

Product	BQ x BP	AQ x AP	AQ x BP
A	2,000 x 2.50 = Rs.5,000	2,400 x 3.00 = Rs. 7,200	2,400 x 2.50 = Rs. 6,000
B	1,500 x 5.00 = Rs.7,500	1,400 x 4.50 = Rs. 6,300	1,400 x 5.00 = Rs. 7,000
C	1,000 x 7.50 = Rs. 7,500	1,200 x 7.00 = Rs. 8,400	1,200 x 7.50 = Rs. 9,000
D	500 x 10.00 = Rs. 5,000	400 x 10.50 = Rs. 4,200	400 x 10.00 = Rs. 4,000
Total	**Rs. 25,000**	**Rs. 26,100**	**Rs. 26,000**

Computation of Variances

Sales Price Variance = Actual quantity (Actual price – Budgeted price)

= (AQ x AP) – (AQ x BP)

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

Sales Volume Variance = Budgeted price (Actual quantity – Budgeted quantity)

= (BP x AQ) – (BP x BQ)

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

Total variance = Actual sales – Budgeted sales

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

PROBLEM NO:24

1. **Material Cost Variance:**

SP = 10

SQ = 48,000 Kg $\begin{bmatrix} 1\,ut & -10\,kgs \\ 4,800 & - \quad ? \end{bmatrix}$

a) SP X SQ = 10 X 48,000 = 4,80,000

b) AP X AQ = (given) = 5,25,000

c) Material Cost Variance (a - b) = 45,000 (A)

2. **Labour Cost Variance:**

SR = 5.50

SH = 28,800 hrs $\begin{bmatrix} 1\,ut & -6\,hrs \\ 4,800 & - \quad ? \end{bmatrix}$

a) SR X SH = 5.50 X 28,800 = 1,58,400

b) AR X AH = 1,55,000

c) Labour Cost Variance (a – b) = 3,400 (F)

3. **FOH Cost Variance:**

SR = $\frac{Rs.4,50,000}{30,000\,hrs}$ = Rs. 15 per hour

a) SR X SH = 15 X 28,800 = 4,32,000

b) AR X AH = 4,70,000

c) FOH Cost Variance (a – b) = 38,000 (A)

4. **VOH Cost Variance:**

VOH Cost Variance = (SR X SH) – (AR X AH)

= (10 X 28,800) – (2,93,000)

= 5,000 (A)

PROBLEM NO:25

FOH Variance :- (HOURS BASIS)

SH × BR (1)	AHW × BR (2)	RBH × BR (3)	BH × BR (4)	AHW × AR (5)
1000 × 5	800 × 5	1200 × 5	1200 × 5	800 × 8
5000	4000	6000	6000	6400

BR = $\frac{BOH}{BH} = \frac{6000}{1200} = Rs.5.$

OH Volume Variances = 1 - 4 = 1000 (A)

SH x BR – 6000 = -1000

SH × BR = 5000

SH × 5 = 5000

SH = 1000 hr.

OH Cost Variances = 1- 5 = 1400 (A)

SH x SR – AH x AR = -1400

1000 x 5 – AH x AR = - 1400

AH x AR = 6400

AH x 8 = 6400

AH = 800 hrs.

1. OH Exp Var = 4 – 5 = RS.400 (A)
2. Act OH = RS.6400
3. AHW = 800 hr.
4. OH Capacity Variance = 2 – 3 =2000(A)
5. OH Eff.Variance = 1 – 2 = 1000 (F)
6. SH = 1000 hr.

THE END