

5. STANDARD COSTING

ASSIGNMENT SOLUTIONS

PROBLEM NO: 1

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

$$M.C.V = (SQ \times SP) - (AQ \times AP) = 50 - 36 = 14(F)$$

PROBLEM NO: 2

Material	Standard (2,10,000 kg)			Actuals (2,10,000 kg)			
	SQ	SP	SQ x SP	AQ	AP	AQ x AP	AQ x SP
	For 70 kg output - 100kg r/m For 2,10,000 kg output - ? 3,00,000 kg	1	3,00,000	2,80,000	0.9 $\left(\frac{2,52,000}{2,80,000}\right)$	2,52,000	2,80,000

$$M.U.V = SQ \times SP - AQ \times SP = Rs.3,00,000 - (Rs.2,80,000 \times 1) = Rs.20,000 (F)$$

$$M.P.V = AQ \times SP - AQ \times AP = Rs.2,80,000 - Rs.2,52,000 = Rs.28,000(F)$$

$$M.C.V = SQ \times SP - AQ \times AP = Rs.3,00,000 - Rs.2,52,000 = Rs.48,000(F)$$

PROBLEM NO: 3

i) Standard cost for Actual output:

$$\text{Material X} = 1,500 \text{ units} \times 2,000 \text{ kg.} \times Rs. 1 = 30,00,000$$

$$\text{Material Y} = 1,500 \text{ units} \times 800 \text{ kg.} \times Rs. 1.50 = 18,00,000 \quad Rs. 48,00,000$$

ii) Material Cost Variance: Standard Cost for actual output - Actual Cost = (SQ x SP) - (AQ x AP)

$$\text{Material X} = \{30,00,000 - (31,00,000 \text{ kg.} \times Rs. 1.10)\} = 30,00,000 - 34,10,000 = 4,10,000 (A)$$

$$\text{Material Y} = \{18,00,000 - (12,50,000 \text{ kg.} \times Rs. 1.60)\} = 18,00,000 - 20,00,000 = 2,00,000 (A)$$

$$= 6,10,000 (A)$$

iii) Material Price Variance: AQ (SP - AP)

$$\text{Material X} = 31,00,000 \text{ kg.} (Rs. 1.00 - Rs. 1.10) = 3,10,000 (A)$$

$$\text{Material Y} = 12,50,000 \text{ kg.} (Rs. 1.50 - Rs. 1.60) = 1,25,000 (A) \quad 4,35,000 (A)$$

iv) Material Usage Variance: SP (SQ - AQ)

$$\text{Material X} = Rs. 1.00 \{(1,500 \times 2,000) - 31,00,000\} = 30,00,000 - 31,00,000 = 1,00,000 (A)$$

$$\text{Material Y} = Rs. 1.50 \{(1,500 \times 800) - 12,50,000\} = Rs. 1.50 (12,00,000 - 12,50,000) = 75,000 (A)$$

$$= 1,75,000 (A)$$

PROBLEM NO: 4

Particulars	Standards (365 kg)			Actual (365 kg)					
	SQ	SP	SQ x SP	AQ	AP	AQ x AP	AQ x SP	RSQ	RSQ x SP
Mat A (35%)	134	25	3,350	125	27	3,375	3,125	140	3,500
Mat B (65%)	250	36	9,000	275	34	9,350	9,900	260	9,360
Input	384 kg		12,350	400 kg		12,725	13,025	400 kg	12,860
Loss (5%)	19		35						
Out put	365		365						

$$M.C.V = SQ \times SP - AQ \times AP = Rs.12,350 - Rs.12,725 = Rs.375 (A)$$

$$M.P.V = AQ \times SP - AQ \times AP = Rs.13,025 - Rs.12,725 = Rs.300 (F)$$

$$M.M.V = RSQ \times SP - AQ \times SP = Rs.12,860 - Rs.13,025 = Rs.165 (A)$$

$$M.Y.V = SP \times SQ - RSQ \times SP = Rs.12,350 - Rs.12,860 = Rs.510 (A)$$

PROBLEM NO: 5

Working Notes:

- a) Standard input = Actual output / 90% = 2,250 kg / 90% = 2,500 kg.
 Standard input of material- A 2,500 kg. x 40% = 1,000 kg.
 Standard input of material- B 2,500 kg. x 60% = 1,500 kg.
- b) Actual input = (Opening Stock + Purchases - Closing Stock)
 Actual input of material- A (40 kg. + 800 kg. - 20 kg.) = 820 kg.
 Actual input of material- B (50 kg. + 1,800 kg. - 15 kg.) = 1,835 kg.
 Total actual input 2,655 kg.
- c) Standard Cost
 Material- A 1000 kg. @ Rs. 5.00 per kg = Rs. 5,000
 Material- B 1500 kg. @ Rs. 4.00 per kg = Rs. 6,000
 = Rs.11,000
- d) Actual Cost
 Material- A 40 kg. @ Rs. 5.00 per kg = Rs. 200
 780 kg. @ Rs. 6.00 per kg = Rs. 4,680 = Rs. 4,880
 Material- B 50 kg. @ Rs. 4.00 per kg = Rs. 200
 1,785 kg. @ Rs. 4.20 per kg = Rs. 7,497 = Rs. 7,697
Rs. 12,577
- i) Material Price Variance = Actual Quantity (Std. Rate - Actual Rate)
 Material- A = 40 kg (Rs. 5.00 - Rs. 5.00) = Nil
 780 kg (Rs. 5.00 - Rs. 6.00) = Rs. 780 (A)
 Material- B = 50 kg. (Rs. 4.00 - Rs. 4.00) = Nil
 1785 kg (Rs. 4.00 - Rs. 4.20) = Rs. 357 (A)
Rs. 1,137 (A)
- ii) Material Usage Variance = Std. Rate (Standard Quantity - Actual Quantity)
 Material- A = Rs. 5.00 (1,000 kg. - 820 kg) = Rs. 900 (F)
 Material- B = Rs. 4.00 (1,500 kg. - 1835 kg.) = Rs.1,340 (A)
Rs. 440 (A)
- iii) Material Yield Variance = Std. Rate (Std. Quantity - Revised Std. Quantity)
 Material- A = Rs. 5.00 (1,000 kg. - 2,655 x 40%)
 = Rs. 5.00 (1,000 kg. - 1,062 kg.) = Rs. 310 (A)
 Material- B = Rs. 4.00 (1,500 kg - 2,655 x 60%)
 = Rs. 4.00 (1,500 kg. - 1,593 kg.) = Rs. 372 (A)
Rs. 682 (A)
- iv) Material Mix Variance = Std. Rate (Revised Std. Quantity - Actual Quantity)
 Material- A = Rs. 5.00 (2,655 x 40% - 820 kg.)
 = Rs. 5.00 (1,062 kg. - 820 kg) = Rs. 1,210 (F)
 Material- B = Rs. 4.00 (2,655 x 60% - 1,835 kg.)
 = Rs. 4.00 (1,593 kg. - 1,835 kg.) = Rs. 968 (A)
Rs. 242 (F)
- v) Material Cost Variance = Std. Cost - Actual cost
 = Rs. 11,000 - Rs. 12,577 = Rs. 1,577 (A)

PROBLEM NO: 6

Material	SQ* × SP	AQ** × SP	AQ** × AP	RSQ*** × SP
Vita-X	Rs. 2,75,000 (2,500 kg. × Rs. 110)	Rs. 3,30,000 (3,000 kg. × Rs. 110)	Rs. 3,45,000 (3,000 kg. × Rs. 115)	Rs. 2,62,460 (2,386 kg. × Rs. 110)
Proto-D	Rs. 4,80,000 (1,500 kg. × Rs. 320)	Rs. 4,00,000 (1,250 kg. × Rs. 320)	Rs. 4,12,500 (1,250 kg. × Rs. 330)	Rs. 4,58,240 (1,432 kg. × Rs. 320)
Mine-L	Rs. 6,90,000 (1,500 kg. × Rs. 460)	Rs. 4,60,000 (1,000 kg. × Rs. 460)	Rs. 4,05,000 (1,000 kg. × Rs. 405)	Rs. 6,58,720 (1,432 kg. × Rs. 460)
Total	Rs. 14,45,000	Rs. 11,90,000	Rs. 11,62,500	Rs. 13,79,420

* Standard Quantity of materials for actual output:

Vita-X	$= \frac{5\text{Kgs.}}{10\text{Kgs.}} \times 5,000\text{Kgs.} = 2,500\text{Kgs.}$
Proto-D	$= \frac{3\text{Kgs.}}{10\text{Kgs.}} \times 5,000\text{Kgs.} = 1,500\text{Kgs.}$
Mine-L	$= \frac{3\text{Kgs.}}{10\text{Kgs.}} \times 5,000\text{Kgs.} = 1,500\text{Kgs.}$

** Actual Quantity of Material used for actual output:

Vita-X	$= \frac{6\text{Kgs.}}{10\text{Kgs.}} \times 5,000\text{Kgs.} = 3,000\text{Kgs.}$
Proto-D	$= \frac{2.5\text{Kgs.}}{10\text{Kgs.}} \times 5,000\text{Kgs.} = 1,250\text{Kgs.}$
Mine-L	$= \frac{2\text{Kgs.}}{10\text{Kgs.}} \times 5,000\text{Kgs.} = 1,000\text{Kgs.}$

*** Revised Standard Quantity (RSQ):

Vita-X	$= \frac{5\text{Kgs.}}{11\text{Kgs.}} \times 5,250\text{Kgs.} = 2,386\text{Kgs.}$
Proto-D	$= \frac{3\text{Kgs.}}{11\text{Kgs.}} \times 5,250\text{Kgs.} = 1,432\text{Kgs.}$
Mine-L	$= \frac{3\text{Kgs.}}{11\text{Kgs.}} \times 5,250\text{Kgs.} = 1,432\text{Kgs.}$

i) **Material Cost Variance** = (Std. Qty. × Std. Price) - (Actual Qty. × Actual Price) = (SQ × SP) - (AQ × AP)

Vita-X	= Rs. 2,75,000 - Rs. 3,45,000	= Rs. 70,000 (A)
Proto-D	= Rs. 4,80,000 - Rs. 4,12,500	= Rs. 67,500 (F)
Mine-L	= Rs. 6,90,000 - Rs. 4,05,000	= Rs. 2,85,000 (F)
		= Rs. 2,82,500 (F)

ii) **Material Price Variance** = Actual Quantity (Std. Price - Actual Price) = (AQ × SP) - (AQ × AP)

Vita-X	= Rs. 3,30,000 - Rs. 3,45,000	= Rs. 15,000 (A)
Proto-D	= Rs. 4,00,000 - Rs. 4,12,500	= Rs. 12,500 (A)
Mine-L	= Rs. 4,60,000 - Rs. 4,05,000	= Rs. 55,000 (F)
		= Rs. 27,500 (F)

iii) **Material Usage Variance** = Std. Price (Std. Qty. - Actual Qty.) = (SQ × SP) - (AQ × SP)

Vita-X	= Rs. 2,75,000 - Rs. 3,30,000	= Rs. 55,000 (A)
Proto-D	= Rs. 4,80,000 - Rs. 4,00,000	= Rs. 80,000 (F)
Mine-L	= Rs. 6,90,000 - Rs. 4,60,000	= Rs. 2,30,000 (F)
		= Rs. 2,55,000 (F)

iv) **Material Mix Variance** = Std. Price (Revised Std. Qty. - Actual Qty.) = (RSQ × SP) - (AQ × SP)

Vita-X = Rs. 2,62,460 - Rs. 3,30,000 = Rs. 67,540 (A)

Proto-D = Rs. 4,58,240 - Rs. 4,00,000 = Rs. 58,240 (F)

Mine-L = Rs. 6,58,720 - Rs. 4,60,000 = Rs. 1,98,720 (F)

= Rs. 1,89,420 (F)

v) **Material Yield Variance** = Std. Price (Std. Qty. - Revised Std. Qty.) = (SQ × SP) - (RSQ × SP)

Vita-X = Rs. 2,75,000 - Rs. 2,62,460 = Rs. 12,540 (F)

Proto-D = Rs. 4,80,000 - Rs. 4,58,240 = Rs. 21,760 (F)

Mine-L = Rs. 6,90,000 - Rs. 6,58,720 = Rs. 31,280 (F)

= Rs. 65,580 (F).

PROBLEM NO:7

Calculation of material variances:

(1)	(2)	(3)	(4)
SP x SQ (W.N.1)	SP x RSQ (W.N.2)	SP x AQ	AP x AQ
X: 15 x 600	15 x 615	15 x 640	17.50 x 640
Y: 20 x 800	20 x 820	20 x 950	18 x 950
Z: 25 x 1,000	25 x 1,025	25 x 870	27.50 x 870
50,000	51,250	50,350	52,225

Standard quantity = Standard quantity for actual production

SQ of X = 600 kgs $\left[\begin{array}{l} 1\text{unit}-60\text{kgs} \\ 10\text{units}-? \end{array} \right]$

SQ of Y = 800 kgs $\left[\begin{array}{l} 1\text{unit}-80\text{kgs} \\ 10\text{units}-? \end{array} \right]$

SQ of Z = 1,000 kgs $\left[\begin{array}{l} 1\text{unit}-100\text{kgs} \\ 10\text{units}-? \end{array} \right]$

RSQ = AQ are written in standard mix

= 2,460 (640 + 950 + 870)



	X	Y	Z
MIX	6	8	10
Quantity	615	820	1,025

Variances:

Material cost variance = (1) - (4) = 2,225(A)

Material price variance = (3) - (4) = 1,875 (A)

Material usage variance = (1) - (3) = 350 (A)

Material mix variance = (2) - (3) = 900 (F)

Material yield variance = (1) - (2) = 1,250 (A)

PROBLEM NO: 8

	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 output - 8 kgs. R/M) (for 1000kg output - ?)	6	4,800	750	7	5,250	4,500	833

R/M B	400 kg (for 10kg output - 4kgs. R/M) (for 1000 kg. output - ?)	4	1,600	500	5	2,500	2,000	417
	1,200 kgs.		6,400	1,250 kg		7,750	6,500	1,250 kg

$$M.C.V. = SQ \times SP - AQ \times AP = Rs.6,400 - Rs.7,750 = Rs.1,350 (A)$$

$$M.P.V. = AQ \times SP - AQ \times AP = Rs.6,500 - Rs.7,750 = Rs.1,250 (A)$$

$$M.U.V. = SQ \times SP - AQ \times SP = Rs.6,400 - Rs.6,500 = Rs.100 (A)$$

PROBLEM NO: 9

Standard and actual costs of material for actual output:

Material	SQ	SP (Rs.)	SQ × SP (Rs.)	AQ	AQ × AP (Rs.)	AQ × SP (Rs.)
A	31,000*	20	6,20,000	32,500	6,59,750	6,50,000
B	69,000**	10	6,90,000	67,000	6,83,400	6,70,000
	1,00,000		13,10,000	99,500	13,43,150	13,20,000

$$*Material\ A - 11,000 \times 2 + 9,000 \times 1 = 31,000\ units$$

$$**Material\ B - 11,000 \times 3 + 9,000 \times 4 = 69,000\ units$$

$$i) \text{ Material Price Variance} = \text{Actual Quantity (Std. Price - Actual Price)} = AQ \times SP - AQ \times AP \\ = 13,20,000 - 13,43,150 = 23,150 \text{ (Adverse)}$$

$$ii) \text{ Material Usage Variance} = \text{Std. Price (Std. Qty. - Actual Qty.)} = SP \times SQ - SP \times AQ \\ = 13,10,000 - 13,20,000 = 10,000 \text{ (Adverse)}$$

$$iii) \text{ Material Cost Variance} = \text{Std. Qty.} \times \text{Std. Price} - \text{Actual Qty.} \times \text{Actual Price} \\ = 13,10,000 - 13,43,150 = 33,150 \text{ (Adverse)}$$

PROBLEM NO: 10

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

$$L.C.V = SH \times SR - AH \times AR = Rs.500 - Rs.360 = Rs.140 (F)$$

$$L.E.V = SH \times SR - AH \times SR = Rs.500 - Rs.450 = Rs.50 (F)$$

$$L.R.V = AH \times SR - AH \times AR = Rs.450 - Rs.360 = Rs.90 (F)$$

PROBLEM NO: 11

SR - Standard labour Rate per Hour

AR - Actual labour rate per hour

SH - Standard Hours

AH - Actual hours

i) Actual labour rate per hour:

$$\begin{aligned} \text{Labour rate Variance} &= AH (SR - AR) \\ &= 17,094 (Rs.8 - AR) = 68,376 (A) = - 68,376 \\ &= Rs. 8 - AR = - 4 \text{ Or, } AR = Rs. 12 \end{aligned}$$

ii) Standard hour required for 6,000 units:

$$\begin{aligned} \text{Labour Efficiency} &= \frac{SH}{AH} \times 100 = 105.3 \\ &= SH = \frac{AH \times 105.3}{100} = \frac{17,094 \text{ hours} \times 105.3}{100} = 17,999.982 \text{ or, } SH = 18,000 \text{ hours} \end{aligned}$$

iii) Labour Efficiency Variance = SR (SH - AH) = Rs. 8 (18,000 - 17,094) = 8 × 906 = Rs. 7,248 (F)

iv) Standard Labour Cost per Unit = $\frac{18,000 \text{ hours} \times \text{Rs. } 8}{6,000 \text{ units}}$ = Rs.24

v) Actual Labour Cost per Unit = $\frac{17,094 \text{ hours} \times \text{Rs. } 12}{6,000 \text{ units}}$ = Rs.34.19

PROBLEM NO: 12

Abnormal idle time : 200 × ½ day = 100 men days

Actual time attended : 200 × 50 days = 10,000 men days

Actual time worked : 10,000 - 100 = 9,900 men days

Actual production : 9,00,000 units

Standard requirements for actual production:

Material : 9,00,000 units / 1,00,000 units = 9 tons or 9,000 kg.

Labour : 9,00,000 / 100 = 9,000 men days

Material Price Variance (Standard price - Actual price) × Actual quantity (Rs.)

(Rs. 20 - Rs. 21) × 10,000 kg. 10,000 (A)

Material Usage Variance (Standard usage - Actual usage) × Standard price (Rs.)

(9,000 kg. - 10,000 kg.) × Rs. 20 20,000 (A)

Total material variance 30,000 (A)

Labour rate variance (Standard rate - Actual rate) × Actual man days attended (Rs.)

(Rs. 6 - Rs. 6.50) × 10,000 hours 5,000 (A)

Labour efficiency variance (Standard man days - Actual man days worked) × Standard rate

(9,000 - 9,900) × Rs.6 5,400 (A)

Idle time variance: Idle man days x Standard rate (Rs.)

100 × Rs.6 600 (A)

Total labour variance 11,000 (A)

PROBLEM NO: 13

Working Note:

Table Showing Standard & Actual Cost

Worker	Standard Hours (a)	Standard Rate per Hour (b)	Standard Cost for Actual Output (c) = (a × b)	Actual Hours Paid (d)	Actual Rate per hour (e)	Actual Cost (f) = (d) × (e)	Idle time (g)	Actual hours worked (h) = (d) - (g)
Skilled	2,340 hrs. [(65 Workers × 40 hrs.) / 2,000 units] × 1,800 units	Rs. 45	Rs.1,05,300	2,000 hrs. (50 Workers × 40 hrs.)	Rs. 50	Rs.1,00,000	100 hrs. (50 Workers × 2 hrs.)	1,900 hrs. (2,000 hrs. - 100 hrs.)
Semiskilled	720 hrs. [(20 Workers × 40 hrs.) / 2,000 units] × 1,800 units	Rs.30	Rs.21,600	1,200 hrs.				
(30 Workers × 40 hrs.)	Rs.35	Rs.42,000	60 hrs. (30 workers × 2 hrs.)	1,140 hrs. (1,200 hrs. - 60 hrs.)				
Unskilled	540 hrs. [(15 Workers × 40 hrs.) / 2,000 units] × 1,800 units	Rs.15	Rs.8,100	800 hrs. (20 Workers × 40 hrs.)	Rs.10	Rs.8,000	40 hrs. (20 Workers × 2 hrs.)	760 hrs. (800 hrs. - 40 hrs.)
Total	3,600 hrs.		Rs.1,35,000	4,000 hrs.		Rs.1,50,000	200 hrs.	3,800 hrs.

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**VOH Variances: (Hours Basis)**

1	2	3
SH x SR	AHW x SR	AHW x AR
1,66,320 x 2.5 = 4,15,800	1,84,800 x 2.5 = 4,62,000	1,84,800 x 4.33 = 8,00,000

Standard Rate = $\frac{\text{Budgeted OverHeads}}{\text{Budgeted Hours}} = \frac{1,00,000}{1,60,000} = \text{Rs. 2.5/hr.}$

Budgeted Hours = 20 x 8,000 = 1,60,000 Hours

Actual Hours worked = 22 x 8,400 = 1,84,800 Hours

Actual Rate = $\frac{\text{ActualOverHeads}}{\text{ActualHours worked}} = \frac{8,00,000}{1,84,800} = \text{Rs. 4.33/hr.}$

Actual Output = 1,84,800 x 1.80 = 3,32,640 units

Standard Hours = 1,66,320 hours $\left[\begin{array}{cc} 1 \text{ hour} & 2 \text{ units} \\ ? & 3,32,640 \text{ units} \end{array} \right]$

1 - 2 = VOH Efficiency Variance = 46,200 (A)

2 - 3 = VOH Expenses Variance = 3,38,000 (A)

1 - 3 = VOH Cost Variance = 3,84,200 (A)

FOH variance (Hours Basis):

1	2	3	4	5
SH x BR	AHW x BR	RBH x BR	BH x BR	AHW x AR
1,66,320 x 5	1,84,800 x 5	1,76,000 x 5	1,60,000 x 5	1,84,800 x 4.54
8,31,600	9,24,000	8,80,000	8,00,000	8,40,000

Budgeted Rate = $\frac{\text{Budgeted OverHeads}}{\text{Budgeted Hours}} = \frac{8,00,000}{1,60,000} = \text{Rs. 5.00/hr.}$

Actual Rate = $\frac{\text{ActualOverheads}}{\text{ActualHours worked}} = \frac{8,40,000}{1,84,800} = \text{Rs.4.54}$

$$\text{Revised Budgeted Hours} = \frac{\text{Actual days}}{\text{Budgeted days}} \times \text{Budgeted Hours} = \frac{22}{20} \times 1,60,000 = 1,76,000 \text{ Hours}$$

- 1 - 2 = FOH Efficiency Variance = 92,400 (A)
 2 - 3 = FOH Capacity Variance = 44,000 (F)
 3 - 4 = FOH Calendar Variance = 80,000 (F)
 1 - 4 = FOH Volume Variance = 31,600 (F)
 4 - 5 = FOH Expenditure Variance = 40,000 (A)
 1 - 5 = FOH Cost Variance = 8,400 (A)

PROBLEM NO: 15

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. Standard Rate = 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 (F)
 iii) FOH Cost Variance = (1) - (5) = 2,000 (F)

PROBLEM NO: 16

Workings:

1. Budgeted Hours = $\frac{\text{Rs. } 30,000}{\text{Rs. } 1 \text{ per hour}} = 30,000 \text{ hours}$
 2. Standard Fixed Overhead rate per hour (Standard Rate):

$$\frac{\text{Budgeted fixed overheads}}{\text{Budgeted Hours}} = \frac{\text{Rs. } 30,000}{30,000 \text{ hours}} = \text{Rs. } 1.00$$

 3. Standard Hour per unit of output = $\frac{30,000 \text{ hours}}{20,000 \text{ units}} = 1.5 \text{ hours}$
 4. Standard hours for Actual Output = 22,000 units $\times$ 1.5 hours = 33,000 Hours
 5. Budgeted Overhead per day for budgeted days = $\frac{\text{Rs. } 30,000}{25 \text{ days}} = \text{Rs. } 1,200$
 6. Budgeted Overhead for actual days worked = 1,200 $\times$ 27 days = Rs. 32,400
 7. Budgeted Hours for Actual days worked = $\frac{30,000 \text{ hours}}{25 \text{ days}} \times 27 \text{ days} = 32,400 \text{ hours}$

Computation of Variances in relation to Fixed Overheads:

i) Efficiency Variance

= Standard Rate $\times$ (Standard hours for actual output - Actual hours worked)
 = Rs. 1.00 (33,000 hours - 31,500 hours) = Rs. 1,500 (Favourable)

ii) Capacity Variance:

= Standard Rate $\times$ (Actual Hours - Budgeted Hours for actual days worked)
 = Rs. 1.00 (31,500 hours - 32,400 hours) = Rs. 900 (Adverse)

iii) Calendar Variance

$$= \text{Standard Fixed Overhead Rate per day} \times (\text{Actual Working days} - \text{Budgeted working days})$$

$$= \text{Rs.1,200} (27 \text{ days} - 25 \text{ days}) = \text{Rs.2,400} (\text{Favourable})$$

iv) Volume Variance

$$= \text{Standard Rate} \times (\text{Standard hours} - \text{Budgeted hours})$$

$$= \text{Rs. 1.00} (33,000 \text{ hours} - 30,000 \text{ hours}) = \text{Rs.3,000} (\text{Favourable})$$

v) Expenditure Variance

$$= \text{Budgeted Overheads} - \text{Actual Overheads}$$

$$= \text{Rs. 30,000} - \text{Rs. 31,000} = \text{Rs.1,000} (\text{Adverse})$$

Note: Overhead Variances may also be calculated based on output.

PROBLEM NO: 17**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

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

$$\text{BH} = 2000 \times 10 = 20,000 \text{ hrs.}$$

$$\text{SH} = 2,100 \times 10 = 21,000 \text{ hrs.}$$

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

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

$$\text{RBH} = \text{BH} = 20,000 \text{ hrs.}$$

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

PROBLEM NO: 18**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:

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

$$2. \text{ RBH} = \text{BH for actual days worked} = 1,62,000 \quad \begin{bmatrix} 25 \text{ days} - 1,50,000 \\ 27 \text{ days} - ? \end{bmatrix}$$

Variances:

$$\text{FOH Expenditure Variance} = (4) - (5) = 6,000 \text{ (A)}$$

$$\text{FOH Volume Variance} = (1) - (4) = 3,090 \text{ (F)}$$

$$\text{FOH Cost Variance} = (1) - (5) = 2,910 \text{ (A)}$$

PROBLEM NO: 19**1. Material Cost Variance:**

$$\text{SP} = 10$$

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

$$\text{a) } \text{SP} \times \text{SQ} = 10 \times 48,000 = 4,80,000$$

$$\text{b) } \text{AP} \times \text{AQ} = (\text{given}) = 5,25,000$$

$$\text{c) } \text{Material Cost Variance (a - b)} = 45,000 \text{ (A)}$$

2. Labour Cost Variance:

$$\text{SR} = 5.50$$

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

$$\text{a) } \text{SR} \times \text{SH} = 5.50 \times 28,800 = 1,58,400$$

$$\text{b) } \text{AR} \times \text{AH} = 1,55,000$$

$$\text{c) } \text{Labour Cost Variance (a - b)} = 3,400 \text{ (F)}$$

3. FOH Cost Variance:

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

$$\text{a) } \text{SR} \times \text{SH} = 15 \times 28,800 = 4,32,000$$

$$\text{b) } \text{AR} \times \text{AH} = 4,70,000$$

$$\text{c) } \text{FOH Cost Variance (a - b)} = 38,000 \text{ (A)}$$

4. VOH Cost Variance:

$$\text{VOH Cost Variance} = (\text{SR} \times \text{SH}) - (\text{AR} \times \text{AH}) = (10 \times 28,800) - (2,93,000) = 5,000 \text{ (A)}$$

PROBLEM NO: 20**a) Material price variance:**

$$= (\text{Standard price} - \text{Actual Price}) \times \text{Actual quantity}$$

$$= (\text{Rs. } 4 - \text{Rs. } 4.10) \times 5,000 = \text{Rs. } 500 \text{ Adv.}$$

b) Material usage variance:

$$= (\text{Std. quantity for actual output} - \text{Actual qty.}) \times \text{Std. price}$$

$$= (600 \times 5 - 3,500) \times 4 = \text{Rs. } 2,000 \text{ Adv.}$$

c) Labour Rate Variance:

$$= (\text{Standard rate} - \text{Actual rate}) \times \text{Actual hours}$$

$$= (\text{Rs. } 10 - \text{Rs. } 9) \times 1,700 = \text{Rs. } 1,700 \text{ Fav.}$$

d) Labour Efficiency Variance:

$$= (\text{Standard hours for actual output} - \text{Actual hours}) \times \text{Standard rate}$$

$$= (600 \times 3 - 1,700) \times \text{Rs. } 10 = \text{Rs. } 1,000 \text{ Fav.}$$

e) Variable Overhead Expenditure Variance:

$$= (\text{Actual Hours} \times \text{Standard Rate}) - \text{Actual Overhead}$$

$$= (1,700 \times \text{Rs.1}) - \text{Rs.1,900} = \text{Rs.200 Adv.}$$

f) Variable Overhead Efficiency Variance:

$$= (\text{Std. hours for actual output} - \text{Actual hours}) \times \text{Std. rate}$$

$$= (600 \times 3 - 1,700) \times \text{Rs.1} = \text{Rs.100 Fav.}$$

g) Fixed Overhead Expenditure Variance:

$$= (\text{Budgeted overhead} - \text{Actual overhead})$$

$$= (1,800 \times 0.50 - 900) = \text{Nil}$$

h) Fixed Overhead Volume Variance:

$$= (\text{Std. hours for actual output} - \text{Budgeted hours}) \times \text{Std. rate}$$

$$= (600 \times 3 - 1,800) \times \text{Rs. 0.50} = \text{Nil}$$

i) Fixed Overhead Capacity Variance:

$$= (\text{Budgeted hours} - \text{Actual Hours}) \times \text{Standard rate}$$

$$= (1,800 - 1,700) \times \text{Rs.0.50} = \text{Rs.50 Adv.}$$

j) Fixed Overhead Efficiency Variance:

$$= (\text{Std. hours for actual output} - \text{Actual hours}) \times \text{Standard rate}$$

$$= (600 \times 3 - 1,700) \times \text{Rs.0.50} = \text{Rs.50 Fav.}$$

Verification:	Amount (in Rs.)	Amount (in Rs.)
Overhead recovered: 600 units @ Rs.4.50		2,700
Actual Overhead:		
Variable	1,900	
Fixed	900	2,800
		100 Adv.
Variable expenditure variance		200 Adv.
Variable Efficiency variance		100 Fav.
Fixed expenditure variance		Nil
Fixed overhead volume variance		Nil
		100 Adv.

Reconciliation Statement:

Standard Cost: 600 units @ R.54.50		32,700	
Actual Cost:	38,600		
Less: Material Stock at standard cost: (1,500 × Rs.4)	6,000	(32,600)	100 Fav.
Variances:	Adv. (Rs.)	Fav. (Rs.)	
Material price	500		
Material usage	2,000		
Labour rate		1,700	
Labour efficiency		1,000	
Variable expenditure	200		
Variable efficiency		100	
Total	2,700	2,800	100 Fav.

PROBLEM NO: 21**FOH Variance: (HOURS BASIS)**

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

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

$$\text{OH Volume Variances} = 1 - 4 = 1000 \text{ (A)}$$

$$SH \times BR - 6000 = -1000$$

$$SH \times BR = 5000$$

$$SH \times 5 = 5000$$

$$SH = 1000 \text{ hr.}$$

$$\text{OH Cost Variances} = 1 - 5 = 1400 \text{ (A)}$$

$$SH \times SR - AH \times AR = -1400$$

$$1000 \times 5 - AH \times AR = -1400$$

$$AH \times AR = 6400$$

$$AH \times 8 = 6400$$

$$AH = 800 \text{ hrs.}$$

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 Efficiency Variance = 1 - 2 = 1000 (F)
6. SH = 1000 hr.

PROBLEM NO: 22

Workings:

Particulars	Skilled	Unskilled
Standard Rate per hour	80	60
Standard time for producing one unit	(Rs.120 ÷ Rs.80) = 1.5 hours	(Rs.90 ÷ Rs.60) = 1.5 hours
Actual hours paid (AH Paid)	6,600 hours	5,400 hours
Standard hours required to produce 4,000 units (SH)	6,000 hours (1.5 hours × 4,000 units)	6,000 hours (1.5 hours × 4,000 units)
Actual hours worked (AH Worked)	$\frac{6,600}{100} \times 97.5 = 6,435 \text{ hours}$	$\frac{5,400}{100} \times 97.5 = 5,265 \text{ hours}$
Revised Std. Hours (RSH)	$\left(\frac{6,600 + 5,400}{100} \times 97.5 \right) \times 0.5$ = 5,850 hours	$\left(\frac{6,600 + 5,400}{100} \times 97.5 \right) \times 0.5$ = 5,850 hours
Abnormal Idle time	6,600 - 6,435 = 165 hours	5,400 - 5,265 = 135 hours

i) Labour Rate Variance = AH Paid (Std. Rate - Actual Rate):

Skilled	6,600 hours (Rs.80 - Rs.87.50)	Rs.49,500 (A)
Unskilled	5,400 hours (Rs.60 - Rs.55)	Rs.27,000 (F)
Total		Rs.22,500 (A)

ii) Labour Efficiency Variance = Std. Rate (SH - AH Worked):

Skilled	Rs.80 (6,000 hours - 6,435 hours)	Rs.34,800 (A)
Unskilled	Rs.60 (6,000 hours - 5,265 hours)	Rs.44,100 (F)
Total		Rs.9,300 (F)

iii) Labour Mix Variance = Std. Rate (RSH - AH Worked)

Skilled	Rs.80 (5,850 hours - 6,435 hours)	Rs.46,800 (A)
Unskilled	Rs.60 (5,850 hours - 5,265 hours)	Rs.35,100 (F)
Total		Rs.11,700 (A)

iv) Labour Yield Variance = Std. Rate (SH - RSH):

Skilled	Rs.80 (6,000 hours - 5,850 hours)	Rs.12,000 (F)
Unskilled	Rs.60 (6,000 hours - 5,850 hours)	Rs.9,000 (F)
Total		Rs.21,000 (F)

v) Labour Idle time Variance = Std. Rate × Idle time Abnormal:

Skilled	Rs.80 × 165 hours	Rs.13,200 (A)
Unskilled	Rs.60 × 135 hours	Rs.8,100 (A)
Total		Rs.21,300 (A)

vi) Variable Overhead Expenditure Variance = AH Worked (SR - AR)

$$= 11,700 \text{ hours} \times \left(\frac{\text{Rs. } 75}{2 \times 1.5 \text{ hours}} - \frac{\text{Rs. } 2,85,000}{11,700 \text{ hours}} \right)$$

$$= 11,700 \text{ hours (Rs. } 25 - 24.36) = \text{Rs. } 7,488 \text{ (F)}$$

vii) Variable Overhead Efficiency Variance:

$$= \text{Std. Rate (SH - AH Worked)}$$

$$= \text{Rs. } 25 (12,000 - 11,700) = \text{Rs. } 7,500 \text{ (F)}$$

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THE END