UNIT - 6

MODULE - 10

STANDARD COSTING

PRACTICAL PROBLEMS

MATERIAL VARIANCE

Problem – 1:

A manufacturing concern, which has adopted standard costing, furnished the following information:

Standard Material for 70 kg finished product: 100 kg.

Price of materials: Re. 1 per kg.

Actual Output: 2,10,000 kg.

Material used: 2,80,000 kg.

Cost of material: Rs. 2,52,000.

Calculate:

(a) Material Usage Variance (b) Material Price Variance (c) Material Cost Variance

Solution:

(1) Standard quantity	For 70 kg standard output
	Standard quantity of material = 100 kg.
	2,10,000 kg. of finished products
	$\frac{2,10,000 \times 100}{70}$ = 3,00,000 kg.

(2) Actual price per kg.	$\frac{Rs.2,52,000}{2,80,000}$ = Re.0.90

(a) Material Usage Variance	= Standard Rate (Standard quantity for actual output – Actual quantity)
	=Re. 1 (3,00,000 – 2,80,000)
	=Re. 1 x 20,000
	=Rs. 20,000 (favorable)

(b) Material Price Variance	=Actual quantity(Standard price -Actual price)
	2,80,000 (Re.1 – Re.0.90)
	2,80,000 x Re.0.10
	Rs. 28,000 (Favorable)

(c) Material Cost Variance	= Standard quantity for actual output x Standard rate) – (Actual quantity x Actual rate)
	=(3,00,000 x 1) – (2,80,000 x 0.90)
	= Rs.3,00,000 x Rs. 2,52,000
	Rs.48,000(favorable)

Verification:

MCV = MPV + MUV

Rs. 48,000 (F) = Rs.28,000 (F) + Rs.20,000 (F)

Problem – 2

The standard mix to produce one unit of product is as follows:

Material A	60 units @ Rs. 15 per unit =	Rs. 9,00
Material B	80 units @ Rs. 20 per unit =	Rs. 1,600
Material C	100 units @ Rs. 25 per unit =	Rs. 2,500
	240 units	Rs. 5,000

During the month of April, 10 units were actually produced and consumption was as follows:

Material A	640 units @ Rs. 17.50 per unit =	Rs. 11,200
Material B	950 units @ Rs. 18.00 per unit =	Rs. 17,100
Material C	870 units @ Rs. 27.50 per unit =	Rs. 23,925
	2,460 units	Rs. 52,225

Calculate all material variances.

Solution:-

Material	**Standard for 10 units**			**Actual for 10 units**		
	Qty	**Rate**	**Amt. Rs.**	**Qty**	**Rate**	**Amt. Rs.**
A	600	15	9,000	640	17.50	11,200
B	800	20	16,000	950	18.00	17,100
C	1,000	25	25,000	870	27.50	23,925
Total	2,400		50,000	2,460		52,225

(1) Material Cost Variance	= Standard cost – Actual cost
	=Rs. 50,000 – Rs.52,225
MCV	= Rs.2,225(A)

(2) Material Price Variance	=(St. Price – Actual Price) x Actual Qty
Material A	= (15- 17.50) x 640 = Rs. 1,600 (A)
Material B	= (20 – 18) x 950 = Rs. 1,900 (F)
Material C	= (25 – 27.50) x 870 = Rs. 2,175 (A)
MPV	= Rs.1,875 (A)

(3) Material Usage Variance	= (St. Qty – Actual Qty.) x St. Price
Material A	= (600 – 640) x 15 = Rs. 600(A)
Material B	= (800- 950) x 20 = Rs.3,000 (A)
Material C	= (1,000 – 870) x 25 = Rs. 3,250 (F)
MUV	= Rs.350 (A)

Check:

MCV =	MPV + MUV
Rs. 2,225 (A) =	Rs. 1,875 (A) + Rs.350 (A)

(4) Material Mix Variance	= (Revised St. Qty – Actual Qty.) x St. Price
Material A	= (615* - 640) x 15 = Rs.375 (A)

Material B	=(820* - 950) x 20 = Rs. 2,600 (A)
Material C	= (1,025* - 870) x 25 = Rs. 3,875 (F)
MMV	= Rs. 900(F)

*Revised Standard Quantity is calculated as follows:

Material A =	$\frac{2460 \times 600}{2400}$	= 615 Units
Material B =	$\frac{2460 \times 800}{2400}$	= 820 Units
Material C =	$\frac{2460 \times 1{,}000}{2400}$	= 1,025 Units

(5) Material Yield Variance	= (Actual yield – Standard yield) x St. output price
	= (10 -10.25) x 5000 = Rs. 1,250 (A)

Check

MCV = MPV + MMV + MYV

Rs. 2,225 (A) = Rs. 1,875 (A) + 900 (F) + Rs.1,250 (A)

Problem : 3

For making 10 kg. of yarn, the standard material requirement is:

Material	Quantity (kg.)	Rate per kg. (Rs.)
White	8	6.00
Black	4	4.00

In March, 1,000 kg. of yarn was produced. The actual consumption of materials is as under:

Material	Quantity (kg.)	Rate per kg. (Rs.)
White	750	7.00
Black	500	5.00

Calculate: (1) MCV (2) MPV (3) MUV

Solution:

Particular	Standard for 1000 kgs.			Actual for 1000 kgs.		
	Quantity	Rate	Amount	Quantity	Rate	Amount
A	800	6	4,800	750	7	5,250
B	400	4	1,600	500	5	2,500
Total	1,200		6,400	1,250		7,750

(1) MCV: SC - AC

= 6,400 - 7,750 **= Rs. 1,350 (A)**

(2) MPV: (SP - AP) x AQ

A = (6 - 7) x 750 **= Rs. 750 (A)**

B = (4 -5) x 500 **= Rs. 500 (A)**

= **1,250(A)**

(3) MUV: (SQ - AQ) x SP

A = (800 - 750) x 6 **= Rs. 300 (F)**

B = (400 - 500) x 4 **= Rs. 400 (A)**

= Rs. 100 (A)

Labour Variance:

Problem-4

Calculate Labour cost variance from the information:

Standard production	: 100 units
Standard Hours	: 500 hours
Wage rate per hour	: Rs. 2
Actual production	: 85 units
Actual time taken	: 450 hours
Actual wage rate paid	: Rs. 2.10 per hour

Solution:

Standard time for one unit = 500 hours ÷ 100 units = 5 hours

Standard hours for actual production 85 units = 85 x 5 = 425 hours

Labour cost Variance = (Std. Hours of Actual Production x Std. Rate) --- (Actual Hours x Actual Rate)

= (425 Hours x Rs. 2) --- (450 Hours x Rs. 2.10)

= (Rs .850 -- Rs. 945)

= RS. 95 (U)

Problem – 5

Standard wage rate is Rs. 2 per hour and standard time is 10 hours. But actual wage rate is Rs. 2.25 per hour and actual hours used are 12 hours.

Calculate Labour cost variance.

Solution:

Labour cost variance = (Std. Rate x Std. Hours) --- (Actual Rate x Actual Hours)

=(Rs. 2 x 10) – (Rs. 2.25 x 12)

= Rs. 20 – Rs. 27

=Rs. --- 7 (U)

Here labour variance is adverse because actual labour cost exceeds standard cost by Rs. 7

Problem – 6

Standard labour hours and rate for production of one unit of Article P is given below:

	Per Unit Hour	Rate per Hour	Total (Rs.)
Skilled worker	5	1.50	7.50
Unskilled worker	8	0.50	4.00
Semi- skilled worker	4	0.75	3.00

Actual Data	Rate per Hour	Total (Rs.)
Articles produced 1,000 units		
Skilled worker 4,500 hour	2.00	9,000
Unskilled worker 10,000 hour	0.45	4,500
Semi- skilled worker 4,200 hour	0.75	3,150

Calculate Labour cost variance.

Solution:

Labour cost variance = (SH for actual production x SR) --- (AH x AR)

Skilled worker = (5,000 x 1.50) --- (4,500 x 2)

= 7,500 – 9,000

= Rs. 1,500 (Adverse)

Unskilled worker = (8,000 x 0.50) --- (10,000 x 0.45)

= 4,000 --- 4,500

= Rs. 500 (Adverse)

Semi- skilled worker = (4,000 x 0.75) --- (4,200 x 0.75)

= 3,000 --- 3,150

= Rs. 150 (Adverse)

Total Labour cost variance = Rs. 2,150(Adverse)

Problem – 7

India Ltd. Manufactures a particular product, the standard direct labour cost of which is Rs. 120 per unit whose manufacture involves the following:

Type of workers	Hours	Rate (Rs.)	Amount (Rs.)
A	30	2	60
B	20	3	60
	50		120

During a period, 100 units of the product were produced, the actual labour cost of which was as follows:

Type of workers	Hours	Rate (Rs.)	Amount (Rs.)
A	3,200	1.50	4,800
B	1,900	4.00	7,600
	5,100		12,400

Calculate: (1) Labour cost variance (2) Labour Rate variance (3) Labour Efficiency variance (4) Labour mix variance.

Solution:

Type of Worker	Standard for 100 units			Actual for 100 units		
	Hours	Rate	Amount	Hours	Rate	Amount
A	3,000	2	6,000	3,200	1.50	4,800
B	2,000	3	6,000	1,900	4.00	7,600
Total	5,000		12,000	5,100		12,400

(1) LCV: SC -AC

LCV = 12,000 - 12,400 = **Rs. 400 (A)**

(2) LRV: (SR - AR) x AH

A = (2 - 1.50) x 3,200 = **Rs. 1,600 (F)**

B = (3 - 4) x 1,900 = **Rs. 1,900 (A)**

= Rs. 300 (A)

(3) LEV: (SH - AH) x SR

A = (3,000 - 3,200) x 2 **= Rs. 400 (A)**

B = (2,000 - 1,900) x 3 **= Rs. 300 (F)**

= Rs. 100 (A)

(4) LMV: (RSH - AH) x SR

A = (3,060 - 3,200) x 2 **= Rs. 280 (A)**

B = (2,040 - 1,900) x 3 **= Rs. 420 (F)**

= Rs. 140 (F)

Working: Revised standard Hours:

RSH = St. hours of the type x Total actual hours / Total St. hours

A = 3,000 x 5,100 / 5,000 = 3,060 hrs.

B = 2,000 x 5,100 / 5,000 = 2,040 hrs.

Overhead Variance:

Problem – 8

MLM Ltd. has furnished you the following information for the month of January:

	Budget	Actual
Outputs (units)	30,000	32,500
Hours	30,000	33,000
Fixed overhead	45,000	50,000
Variable overhead	60,000	68,000
Working days	25	26

Calculate overhead variances.

Solution:

Necessary calculations

$$\text{Standard hour per unit} = \frac{\text{Budgeted hours}}{\text{Budgeted units}} = \frac{30,000}{30,000}$$

Standard hour for actual output = 32,500 units x 1 hour = 32,500

Standard overhead rate per hour = $\frac{\text{Budgeted overheads}}{\text{Budgeted hours}}$

For fixed overhead = $\frac{45,000}{30,000}$ = Rs. 1.50 per unit

For variable overhead = $\frac{60,000}{30,000}$ = Rs. 2 per unit

Standard fixed overhead rate per day = Rs. 45,000 ÷ 25 days = Rs. 1,800

Recovered overhead = Standard hours for actual output x Standard Rate

For fixed overhead = 32,500 hours x Rs. 1.50 = Rs. 48,750

For variable overhead = 32,500 hours x Rs. 2 = Rs. 65,000

Standard overhead =Actual hours x Standard Rate

For fixed overhead =33,000 x 1.50 =Rs. 49,500

For variable overhead =33,000 x 2 = Rs. 66,000

Revised budgeted hours = $\frac{\text{Budgeted Hours}}{\text{Budgeted Days}}$ x Actual days

$\frac{30,000}{25}$ x 26 = 31,200 hours

Revised budgeted overhead = 31,200 x 1.50 = Rs. 46,800

Calculation of Variances

Fixed Overhead Variances:

- Fixed Overhead Cost Variance = Recovered Overhead – Actual Overhead

  = 48,750 – 50,000 =**Rs. 1,250 (A)**

- Fixed Overhead Expenditure Variance = Budgeted Overhead – Actual Overhead

  =45,000 – 50,000 **=Rs. 5,000 (A)**

- Fixed Overhead Volume Variance = Recovered Overhead – Budgeted Overhead

  = 48,750 – 45,000 =**Rs. 3,750 (F)**

- Fixed Overhead Efficiency Variance = Recovered Overhead – Standard Overhead

  = 48,750 – 49,500 **= Rs. 750 (A)**

- Fixed Overhead Capacity Variance = Standard Overhead – Revised Budgeted Overhead

  = 49,500 – 46,800 **=Rs. 2,700 (F)**

- Calendar Variance =(Actual days – Budgeted days) x Standard rate per day=
  (26—25) x 1,800 =**Rs. 1,800 (F)**

Variable Overhead Variances:

- Variable Overhead Cost Variance = Recovered Overhead – Actual Overhead

  = 65,000 – 68,000 = **Rs. 3,000 (A)**

- Variable Overhead Expenditure Variance = Standard Overhead – Actual Overhead

  = 66,000 – 68,000 =**Rs. 2,000(A)**

- Variable Overhead Efficiency Variance = Recovered Overhead – Actual Overhead = 65,000 -- 66,000 = **Rs. 1,000 (A)**