

STANDARD COSTING

Question 1

A company actually sold 8000 units of A and 10,000 units of B at ₹ 12 and ₹ 16 per unit respectively against a budgeted sale of 6000 units of A at ₹ 14 per unit and 9000 units of B at ₹ 13 per unit. The standard costs of A and B are ₹ 8 and ₹ 10 per unit respectively and the corresponding actual costs are ₹ 5.5 and ₹ 14.5 per unit.

Compute the product wise sales margin mix and sales margin price variances, indicating clearly, whether the variances are favorable or adverse. (5 Marks)(May 2011)

Answer

	BQ	RBQ	AQ	AP	<u>BP</u>	<u>BC</u>	<u>BM</u>	<u>AM</u>
A	6000	7200	8000	12	14	8	6	4
B	<u>9000</u>	<u>10800</u>	10000	16	13	10	3	6
	<u>15000</u>	<u>18000</u>						

Sales Margin Mix Variance:

(Actual Qty in Budgeted Mix – Actual Qty in Actual Mix) x Budgeted Margin

$$A : (7,200 - 8,000) \times 6 = -4,800 \text{ (Fav)}$$

$$B : (10,800 - 10,000) \times 3 = \underline{2,400} \text{ (Adv)}$$

$$\text{Total Mix Variance} = \underline{-2,400} \text{ (Fav)}$$

Sales Margin Price Variance = Actual Qty (Budgeted Margin – Actual Margin)

$$A \quad 8,000 (6 - 4) = 16,000 \text{ (A)}$$

$$B \quad 10,000 (3 - 6) = \underline{30,000} \text{ (F)}$$

$$\text{Total Price Variance} = \underline{14,000} \text{ (F)}$$

Question 2

The following profit reconciliation statement has been prepared by the Cost Accountant of RSQ Ltd. for March, 2008:

	₹
Budget profit	2,40,000
Sales price variance	51,000 (F)
Sales volume profit variance	<u>42,000</u> (A)
	2,49,000
Material price variance	15,880 (A)
Material usage variance	3,200 (F)
Labour rate variance	78,400 (F)
Labour efficiency variance	32,000 (A)
Variable overhead expenditure variance	8,000 (F)
Variable overhead efficiency variance	12,000 (A)
Fixed overhead volume variance	1,96,000 (A)
Fixed overhead expenditure variance	<u>4,000</u> (F)
Actual profit	<u>86,720</u>

Budgeted production and sales volumes for March, 2008 were equal and the level of finished goods stock was unchanged, but the stock of raw materials decreased by 6,400 kg (valued at standard price) during the month.

The standard cost card is as under:

Material 4 kg @ ₹ 2.00	8.00
Labour 4 hours @ ₹ 32.00	128.00
Variable overhead	
4 hours @ ₹ 12.00	48.00
Fixed overheads	
4 hours @ ₹ 28.00	<u>112.00</u>
	296.00
Standard profit	<u>24.00</u>
Standard selling price	<u>320.00</u>

The actual labour rate was ₹ 2.24 lower than the standard hourly rate.

You are required to calculate:

- (i) Actual quantity of material purchased
- (ii) Actual production and sales volume

(iii) Actual number of hours worked

(iv) Actual variable and fixed overhead cost incurred.

(11 Marks) (Nov., 2008)

Answer

$$\begin{aligned}
 \text{(i) Budgeted volume} &= \frac{\text{Budgeted profit}}{\text{Budgeted profit per unit}} \\
 &= \frac{2,40,000}{24.00} \\
 &= 10,000 \text{ units}
 \end{aligned}$$

$$\begin{aligned}
 \text{Difference between actual and budgeted volume} &= \frac{\text{Fixed overhead volume variance}}{\text{Standard fixed overhead rate}} \\
 &= \frac{1,96,000}{112} \\
 &= 1,750 \text{ units}
 \end{aligned}$$

$$\begin{aligned}
 \text{Actual Production} &= \text{Budgeted volume} - \text{Difference between actual and budget volume} \\
 &= 10,000 - 1,750 \\
 &= 8,250 \text{ units}
 \end{aligned}$$

(ii) Actual production = 8,250 units

$$\text{Material quantity} = 4 \text{ kg.} \times 8,250 = 33,000 \text{ kg.}$$

Less: Difference in material use

$$\text{Material} = \frac{\text{Usage variance}}{\text{Standard price}} = \frac{3,200}{2.00} = 1,600 \text{ kg.}$$

$$\text{Actual usages} \quad 31,400 \text{ kg.}$$

$$\text{Less: Decrease in stock} \quad \underline{6,400 \text{ kg.}}$$

$$\text{Actual purchases} \quad \underline{25,000 \text{ kg.}}$$

(iii) Actual hours

$$8,250 \text{ units} \times 4 \text{ hours} = 33,000 \text{ hours}$$

Difference in actual and standard

$$\frac{\text{Efficiency variance}}{\text{Standard rate}} = \frac{32,000 \text{ (A)}}{32.00} = 1,000 \text{ (A) hours}$$

$$\text{Actual hours} \quad \underline{34,000 \text{ hours}}$$

(iv) Actual variable overhead incurred:

$$\begin{aligned}\text{Standard cost of variable overhead} &= 8,250 \times 48 &= ₹ 3,96,000 \\ \text{Total variable overhead cost variance [8,000 (F) + 12,000 (A)]} &= ₹ \underline{4,000 (A)} \\ \text{Actual variable overhead} &= ₹ \underline{4,00,000}\end{aligned}$$

(v) Actual fixed overhead:

$$\begin{aligned}\text{Budgeted fixed overhead} &= \\ \text{Budgeted units} \times \text{Budgeted rate} &= 10,000 \times 112 &= ₹ 11,20,000 \\ \text{Expenditure variance} &= ₹ \underline{4,000 (F)} \\ \text{Actual fixed overhead} &= ₹ \underline{11,16,000}\end{aligned}$$

It can also be calculated as below:

Actual fixed overhead:

$$\begin{aligned}\text{Standard fixed overhead} &= (\text{Actual output} \times \text{Standard fixed overhead rate per unit}) &= 8,250 \times 112 &= ₹ 9,24,000 \\ \text{Total fixed overhead variance [1,96,000 (A) + 4,000 (F)]} &= ₹ \underline{1,92,000 (A)} \\ \text{Actual fixed overhead} &= ₹ \underline{11,16,000}\end{aligned}$$

(vi) Actual sales volume:

$$\text{Sales volume variance} = \text{Standard profit per unit} (\text{Actual quantity of sales} - \text{Standard quantity of sales})$$

$$42,000 (A) = 24 (\text{Actual Quantity of sales} - 10,000)$$

$$\text{Actual quantity of sales} = 8,250 \text{ units}$$

Alternative for (iv) and (v) points

- (1) Variable overhead cost variance = (Standard hours for actual output $\times$ Standard variable overhead rate per hour) – Actual variable overhead cost

$$4,000 (A) = (4 \times 8,250 \times 12) - \text{Actual variable overhead}$$

$$\text{Actual variable overhead} = ₹ 4,00,000.$$

- (2) Fixed overhead cost variance = (Standard hours for actual output $\times$ Standard fixed overhead rate per hour) – Actual fixed overheads

$$1,92,000 (A) = (4 \times 8,250 \times 28) - \text{Actual fixed overheads.}$$

$$\text{Actual fixed overhead} = ₹ 11,16,000.$$

Question 3

The following information relates to labour of x Ltd.

Type of Labour	Skilled	Semi Skilled	Unskilled	Total
No. of workers in standard gang	4	3	2	9
Standard rate per hour (Rs)	6	3	1	-
Number of workers in actual gang				
Actual rate per hour (₹)	7	2	2	-

In a 40 hours week, the gang produced 270 standard hours.

The actual number of semi-skilled workers is two times the actual number of unskilled workers. The rate variance of semi-skilled workers is ₹160 (F).

Find the following:

- The number of workers in each category
- Total gang variance
- Total Sub-efficiency variance
- Total labour rate variance
- Total labour cost variance

(10 Marks)(Nov., 2009)

Answer

	SR	SH		SR	RSH		SR	AH		AR	AH	
Skill	6×	120	720	6×	960	160	6×	120	120	7×	120	840
Semi-Skill	3×	90	270	3×	360	120	3×	160	480	2×	160	320
Unskilled	1×	60	<u>60</u>	1×	<u>80</u>	80	1×	80	<u>80</u>	2×	80	<u>160</u>
			<u>1050</u>		<u>1400</u>				<u>1280</u>			<u>1320</u>
			Sub-efficiency Variance						Gang Variance			
			350 (A)						120 (F)			
									Rate Variance			
									40 (A)			
			Cost Variance = 270 (A)									

Workings Note:

Standard hours produced = 270

Standard Mix : $270 \div 9 = 30$

	Skill	Semi-Skill	Unskilled
Ratio	4:	3:	2:
Hrs.	120	90	60

Actual hrs = $40 \times 9 = 360$ hrs.

Actual hrs in Standard Ratio = 360		
4: $\frac{360}{9} \div 4 = 160$	3: $\frac{360}{9} \div 3 = 120$	2: $\frac{360}{9} \div 2 = 80$

[(Standard Rate = Actual Rate) Actual hrs.] = Rate Variance

Semi-skilled = 160

(3 – 2) Actual hrs = 160

Actual hrs = 160 (for semi-skilled)

Actual Semi-skilled = 2 (Unskilled actual)

160 = 2 (Unskilled)

Unskilled hrs (actual) = $\frac{160}{2} = 80$

Total Actual = 360

\ Actual hrs – skilled = $360 - (160 + 80)$
 = $360 - 240 = 120$

Actual Hrs.	Skilled	Semi-skilled	Unskilled
40 hr week	120	160	80
\ No. of Workers	$\frac{120}{40} = 3$	$\frac{160}{40} = 4$	$\frac{80}{40} = 2$
(i)	3	4	2

(ii) Gang Variance:

= (Actual Hrs in Standard Ratio – Actual Hrs in Actual Ratio) $\times$ Standard Rate
 = $1400 - 1280 = 120$ (F)

(iii) Sub-efficiency Variance:

= Standard Rate (Standard Hrs – Actual Hrs in Standard Ratio)
 = $1050 - 1400 = 350$ (A)

(iv) Total Labour Rate Variance:

= Actual Hrs (Standard Rate – Actual Rate)
 = $1280 - 1320 = 40$ (A)

(v) Labour Cost Variance:

$$= (\text{Standard Rate} \times \text{Standard Hrs} - \text{Actual Rate} \times \text{Actual Hrs.})$$

$$= 1050 - 1320 = 270 \text{ (A)}$$

Question 4

X Ltd. produces and sells a single product. Standard cost card per unit of the product is as follows (12 Marks)

	₹.
Direct materials :A 10 kg @ Rs. 5 per kg	50.00
B 5 kg @ ₹ 6 per kg	30.00
Direct wages 5 hours @ ₹ 5 per hour	25.00
Variable production overheads 5 hours @ 12 per hour	60.00
Fixed production overheads	<u>25.00</u>
Total Standard cost	<u>190.00</u>
Standard gross profit	<u>35.00</u>
Standard selling price	<u>225.00</u>

A fixed production overhead has been absorbed on the expected annual output of 25,200 units produced evenly throughout the year. During the month of December, 2009, the following were the actual results for an actual production of 2,000 units:

	₹
Sales 2,000 units @ ₹ 225	<u>4,50,000</u>
Direct materials :A 18,900 kg	99,225
B 10,750 kg	61,275
Direct Wages 10,500 hours (actually worked 10,300 hours)	50,400
Variable production overheads	1,15,000
Fixed production overheads	<u>56,600</u>
Total	<u>3,82,500</u>
Gross profit	<u>67,500</u>

The material price variance is extracted at the time of receipt of materials. Material purchase were a 20,000 kg. @ ₹ 5.25 per kg; B 11,500 kg @ ₹ 5.70 per kg.

Required:

- Calculate all variances.
- Prepare an operating statement showing Standard gross profit, Variances and Actual gross profit.

- (iii) Explain the reason for the difference in actual gross profit given in the question and calculated in (ii) above. (12 Marks)

Answer

(i) Material Price variance	= (SP-AP) AQ
A	= (5-5.25) x 20000 = 5000(A)
B (At the time of receipt of Materials)	= (6.5.70) x 11500 = 3450(F)
	= 1550 (A)
Material usage variance	= (SQ – AQ) * SP
A	= (20000 – 18900)x 5 = 5500 (F)
B	= (10000 – 10750) x 6 = 4500 (A)
	= 1000 (F)
Standard quantity for actual output for	
A	= 2000 x 10 = 20000 kg
B	= 2000 x 5 = 10000 kg
Material Mix variance = SP (RSQ –AQ)	
A	= (19766.67 – 18900) x5 = 4333.33 (F)
B	= (9883.33 – 10750) x6 = 5200.00 (A)
	= 866.67 (A)
Revised standard quantity	
A	= 20000/30000 x 29650 = 19766.67
B	= 10000/30000 x 29650 = 9883.33
Material yield variance	= SR (AY- SY) (2000- 1976.67) x 80
	= 1866.67 (F)
SY	= (2100/31500) x 29650 = 1976.67
Labour rate variance	= (SR- AR) AH = (5-4.8) x 10500
	= 2100 (F)
Labour efficiency variance	= SR(SH – AH) = (10000- 10300) x 5
	= 1500(A)
Labour idle time variance	= Idle hours x SR = 200 x 5 = 1000 (A)
Variable overhead cost variance	= Recovered overhead – Actual overhead

	= (2000 x 60 – 115000) = 5000(F)
Variable overhead exp. Variance	= Standard variable overhead – Actual variable overhead
	= 10300 x 12 – 115000 = 8600 (F)
Variable overhead efficiency variance	= Recovered – Standard variable overhead
	= 120000 – 123600 = 3600(A)
Fixed overhead cost variance	= Recovered overhead – actual overhead
	= (2000 x 25 – 56600) = 6600 (A)
Fixed overhead exp. Variance	= Budgeted overhead – Actual overhead
	= (2500 /12 x 25) – 56600) = 4100(A)
Fixed overhead volume variance	= Recovered – Budgeted overhead
	= (50000 – 52500) = 2500 (A)

(ii) **Reconciliation Statement**

	(₹)	(₹)	(₹)
Standard Profit (35 * 2000)			70000
Variances	Favourable	Adverse	
Material : Price (at the time of receipt)		1550	
Mix			
Yield		866.67	
	1866.67		
Labour : Rate	2100		
Efficiency		1500	
Idle time		1000	
Variable overheads Expenditure	8600		
Efficiency		3600	
Fixed overheads Expenditure		4100	
Volume		2500	
	<u>12566.67</u>	<u>15116.67</u>	<u>2550 (A)</u>
Actual Profit			<u>67450</u>

- (iii) Actual gross profit given in the question is ₹ 67500 while calculated operating profit in statement is ₹ 67450. The difference amount is due to material price variance that is calculated at the time of receipt of material instead of consumption of material.

$$\text{MPV A} = 18900 \times (5 - 5.25) = 4725 \text{ (A)}$$

$$\text{B} = 10750 \times (6 - 5.70) = 3225 \text{ (F)}$$

$$1500 \text{ (A)}$$

Over recovery in the operating statement is $(1550 - 1500) = 50$, should be added in actual profit $67450 + 50 = ₹ 67500$.

Question 5

A company is engaged in manufacturing of several products. The following data have been obtained from the record of a machine shop for an average month:

Budgeted

No. of working days	24
Working hours per day	8
No. of direct workers	150
Efficiency	One standard hour per clock hour
Down time	10%
Overheads	
Fixed	₹ 75,400
Variable	₹ 90,720

The actual data for the month of August 2010 are as follows:

Overheads	
Fixed	₹ 78,800
Variable	₹ 70,870
Net operator hours worked	20,500
Standard hours produced	22,550

There was a special holiday in August 2010.

Required :

- Calculate efficiency, activity, calendar and standard capacity usages ratio.
- Calculate all the relevant fixed overhead variances.
- Calculate variable overheads expenditure and efficiency variance. (10 Marks)

Answer

Ratio	Working	Result
Efficiency Ratio	$\frac{\text{Output expressed in Standard Hours}}{\text{Actual Hours Worked}}$	$(22550/20500) \times 100 = 110\%$

$$\text{Activity Ratio} = \frac{\text{Output expressed in Standard Hours}}{\text{Budgeted output in standard hours}} = \frac{(22550/25920) \times 100}{\text{or } 86.99\%} = 87\%$$

$$\text{Calendar Ratio} = \frac{\text{Actual Working days in a period}}{\text{No. of working days in related budget period}} = \frac{(23/24) \times 100}{\text{or } 96\%} = 96\%$$

$$\text{Standard Capacity usage ratio} = \frac{\text{Budget Hours}}{\text{Maximum No. of hours in related period}} = \frac{(25920/28800) \times 100}{\text{or } 90\%} = 90\%$$

Workings

Maximum Hours	= 24 × 8 × 150	28,800
Budgeted Hours	= 28800 less 10%	25,920
Actual Hours (given)		20,500
Standard Hours (produced)		22,550
Budgeted Working days		24
Actual Working days		23

Standard Rate X Standard Hours	Standard Rate X Standard Hours	Actual Hours X Actual Rate
(1)	(2)	(3)
(90720/25920)*22550 ₹ 78925	(90720/25920)*20500 ₹ 71750	Given ₹ 70870

Variable Overhead Efficiency Variance	(1) - (2)	₹ 7175 (F)
Variable Overhead Expenditure Variance	(2) - (3)	₹ 880 (F)
Variable Overhead Variance	(1) - (3)	₹ 8055 (F)

Budgeted Fixed Overheads

Standard Rate X Standard Hours	Standard Rate X Actual Hours	Standard Rate X Revised Budgeted Hours	Standard Rate X Budgeted Hours	Actual Overheads
(1)	(2)	(3)	(4)	(5)
2.91 X 22550 = 65621	2.91 X 20500 = 59655	2.91 X 24840 = 72284	Given = 75400	Given = 78800

Fixed Overhead Efficiency Variance	(1) - (2)	₹ 5,966(F)
Fixed Overhead Capacity Variance	(2) - (3)	₹ 12,629(A)
Fixed Overhead Calender Variance	(3) - (4)	₹ 3,116(A)
Fixed Overhead Volume Variance	(1) - (4)	₹ 9,779(A)
Fixed Overhead Expenditure Variance	(4) - (5)	₹ 3,400(A)
Fixed Overhead Variance	(1) - (5)	₹ 13,179(A)