5
Standard Costing

Question 1

C Preserves produces Jams, Marmalade and Preserves. All the products are produced in a similar fashion; the fruits are cooked at low temperature in a vacuum process and then blended with glucose syrup with added citric acid and pectin to help setting.

Margins are tight and the firm operates, a system of standard costing for each batch of Jam.

The standard cost data for a batch of raspberry jam are

Fruits extract	*400 kgs @ ₹16 per kg.*
Glucose syrup	*700 kgs @ ₹10 per kg.*
Pectin	*99 kgs. @ 33.2 per kg.*
Citric acid	*1 kg at ₹200 per kg.*
Labour	*18 hours @ ₹32.50 per hour.*

Standard processing loss 3%.

The climate conditions proved disastrous for the raspberry crop. As a consequence, normal prices in the trade were ₹19 per kg for fruits abstract although good buying could achieve some savings. The impact of exchange rates for imported sugar plus the minimum price fixed for sugarcane, caused the price of syrup to increase by 20%.

The retail results for the batch were –

Fruit extract	*428 kgs at ₹18 per kg.*
Glucose syrup	*742 kgs at ₹12 per kg.*
Pectin	*125 kgs at ₹32.8 per kg.*
Citric acid	*1 kg at ₹95 per kg.*
Labour	*20 hrs. at ₹30 per hour.*

Actual output was 1,164 kgs of raspberry jam.

You are required to:

(i) Calculate the ingredients planning variances that are deemed uncontrollable.

(ii) Calculate the ingredients operating variances that are deemed controllable.

(iii) Calculate the mixture and yield variances.

(iv) Calculate the total variances for the batch. *(11 Marks) (May, 2005)*

Answer

Details of original and revised standards and actual achieved

	Original standards		Revised standards		Actual	
Fruit	400 Kgs × ₹ 16	₹ 6,400	400 Kgs × ₹ 19	₹7,600	428 Kgs × ₹ 18	₹7,704
Glucose	700 Kgs × ₹ 10	₹ 7,000	700 Kgs × ₹12	₹ 8,400	742 Kgs × ₹ 12	₹ 8,904
Pectin	99 Kgs × ₹ 33.2	₹ 3286.8	99 Kgs × ₹ 33.2	₹ 3286.8	125Kgs × ₹ 32.8	₹ 4,100
Citric acid	1 Kg × ₹ 200	₹ 200	1 Kg × ₹ 200	₹ 200	1 Kg × ₹ 95	₹ 95
	1,200 kgs	₹16,886.8	1,200 kgs	₹19,486.8	1,296 kgs	₹20,803
Labour		₹ 585.0		₹ 585.0		₹ 600
	1,200 kgs	17,471.8	1,200 kgs	20,071.8	1,296 kgs	21,403
Loss	36 kgs		36kgs		132	
	1,164kgs	₹ 17,471.8	1,164kgs	₹ 20,071.8	1,164 Kgs	₹ 21,403

(i) Planning variances

* Fruit extract (6,400 less 7,600)	₹ 1,200(Adverse)
Glucose syrup (7,000 less 8,400)	₹ 1,400(Adverse)
Total	₹ 2,600(Adverse)

* (Std qty × Std price less Std qty × Revised Std price)

(ii) Ingredients operating variances

Total (19,486.8 less 20,803) = ₹ 1,316.2(Adverse)

Ingredients Price variance

(Revised Material Price – Actual Material Price) × (Actual Qty Consumed)

		Variance in ₹
Fruit extract	(19 – 18) × 428	428(F)
Glucose syrup		Nil
Pectin	(33.2 – 32.8) × 125	50(F)
Citric acid	(200 – 95) × 1	105(F)
		583(F)

Usage variance

(Std Qty on Actual Production less Actual Qty on Actual Production) × Revised Std Price/Unit

	₹	*Variance in ₹*
Fruit extract	(400 – 428) × 19	532(A)
Glucose syrup	(700 – 742) ×12	504(A)
Pectin	(99 – 125) ×33.2	863.2(A)
Citric acid		Nil
		1,899.2(A)

(iii) Mix Variance

(Actual usage in std mix less Actual usage in actual mix) ×std price

		Variance in ₹
Fruit extract	(432 – 428) ×19	76(F)
Glucose syrup	(756 – 742) × 12	168 (F)
Pectin	(106.92 – 125) ×33.2	600.3(A)
Citric acid	(1.08 – 1) ×200	16(F)
		340.3 (A)

Yield variance

(Actual yield – Std yield from actual output) × Std cost per unit of output

$$= (1{,}164 - 1{,}296 \times 0.97) \times \frac{19486.8}{1164} = 1{,}558.9(A)$$

Labour operating variance

585 – 600 = 15(A)

(iv) Total variance = Planning variance + Usage Variance + Price Variance + labour operating Variance.

Or Total Variance = (2,600) + (1,899.2) + 583 + (15) = 3931.2 (A).

Question 2

Rainbow Ltd. manufactures paint in batches. The company uses standard costing system and the variances are reported weekly. You have taken the account sheet for study for variance analysis discussion. While working coffee was spilled on these sheets and only following could have been retrieved:

Dr.			*Cr.*
	Raw Material - 1		
Beg. Balance	*0*		*18,000*
		Closing Balance	*6,000*
	Raw Material - 2		
Beg. Balance	*18,000*		
		Closing Balance	*41,400*

Work in Progress

Beg. Balance	*0*		
Raw Material -2	*72,000*	*Closing Balance*	*0*
	Sundry Creditors		
			1,27,200
	Wages outstanding		
	51,750		
	Quantity Variance-Material-1		
	1,200		
	Price Variance-Material-2		
			6,600
	Efficiency Variance-Labour		
			7,200

Other information's are: standard cost of Material – 2 is ₹ 180 per litre and standard quantity is 5 litres. Standard wages rate is ₹ 24 per hour and a total 2,300 hours were worked during the week. 1,000 kg of Material -1and 550 litres of Material-2 were purchased. Sundry creditors are for material acquisition, and wages outstanding pertain to direct labour.

You are required to compute Material-1 Rate Variance, Material-2 Quantity Variance & Labour Spending Variance, Standard hours allowed for production and purchase value of Material-1 for variance analysis discussion. ***(11 Marks) (Nov, 2005)***

Answer

Material – 1 Rate Variance = Standard cost of material purchased – Actual cost

= ₹24, 000 – ₹21, 600 = ₹2, 400 (F)

Material – 2 Quantity Variance	= SR × SQ – SR × AQ
	= ₹ 900 × 80 units – ₹ 75, 600
	= ₹ 3, 600 (A)
Labour Spending Variance	= SR × AH – AR × AH
	= ₹ 24/per hour × 2300 hours – ₹ 51, 750
	= ₹ 3, 450 (A)
Labour Efficiency Variance	= SR × (SH – AH)
– 7200	= 24 (SH – 2300)
SH	= 2000 Hrs.

	₹
Total Cost of material purchased	1,27,200
Less Purchase Value of Material – 2	1,05,600
Cost of material –1	21,600

Working Notes:

(1) Standard Cost of Material – 2 actually consumed in production = ₹ 72, 000 (Given)

Standard cost of Material – 2 per unit: 5 litres × ₹ 180	= ₹ 900
∴No of units produced	= ₹ 72, 000 / ₹900 = 80 units
Total material – 1 used in production	= ₹ 18, 000 (Given)
Add Closing Inventory	= ₹ 6, 000 (Given)
Less Opening Inventory	= 0
Hence Standard Cost of Material – 1 purchased	= ₹ 24, 000

(2)

Standard Rate of Material -1	= ₹24, 000 / 1,000kg = ₹ 24 per kg
Standard Cost of Material – 1	= ₹ 18, 000
Add favourable Quantity Variance	= ₹ 1, 200
Material – 1 allowed	= ₹ 19, 200
Standard quantity of Material – 1 allowed	= ₹19, 200/₹24= 800 Kg.
Standard quantity per unit	= 800kg/80units = 10 kg
Standard purchase price for Material – 2	= (550liters × ₹180)= ₹ 99, 000
Add unfavourable Rate Variance	= ₹ 6, 600
Actual cost Price of Material – 2	= ₹ 1, 05, 600

(3)	Opening balance of Material – 2	= ₹ 18, 000
	Add Standard Cost of Purchase (550 litres × ₹180)	= ₹ 99, 000
	Less Closing Balance	= ₹ 41, 400
	Material-2 Consumed at Standard cost	= ₹ 75, 600

Question 3

"Overhead variances should be viewed as interdependent rather than independent". Explain.

(6 Marks) (May, 2006)

Answer

The operations of a firm are so inter linked that the level of performance in one area of operation will affect the performance in other areas. Improvements in one area may lead to improvements in other areas. A sub-standard performance in one area may be compensated by a favourable performance in another area. Because of such interdependency among activities in the firm, the managers should not jump to conclusions merely based on the label of variances namely favourable or unfavourable. They should remember that there is a room for trade off amongst variances. Hence, variances need to be viewed as 'attention directors' rather than problem solvers. Thus, a better picture will be captured when overhead variance are not viewed in isolation but in an integrated manner.

Question 4

The following figures are available. Find out the missing figures, giving appropriate formulae:

		₹
Budgeted profit		*15,000*
Less: Adverse variances:		
Contribution price variance	*10,600*	
Direct materials variance	*1,000*	
Fixed overhead variance	*600*	*(12,200)*
		2,800
Add: Favourable variances		
Contribution quantity variance	*1,800*	
Direct wages variance	*600*	
Variable overhead variance	*1,800*	*4,200*
Actual profit		*7,000*

There is no inventory

Production units = Sales units for both actual and budget.

Standard selling price	*₹18/unit*
Standard variable cost	*₹15/unit*
Standard contribution	*₹3/unit*
Actual selling price	*₹17/unit*
Budgeted sales	*10,000 units*

Standard material cost p.u. = ₹1 (which is 5 kg. @ ₹20 Paise/kg.).

Material usage variance = 400 (Adv.)

Actual labour hours @ actual rate = ₹63,000

Actual labour hours @ standard rate = ₹61,950

Variable overhead standard rate = ₹2

Standard hours of production = 4 per unit

Variable overhead at standard rate = ₹84,800.

Variable overhead expenditure variance = 400 (A).

Budgeted fixed overhead = ₹15,000.

Find out the following:

(i) Actual sales units

(ii) Actual sales rupees

(iii) Actual quantity of raw materials used

(iv) Labour efficiency variance

(v) Actual variable overhead in rupees

(vi) Variable overhead efficiency variance

(vii) Actual fixed overheads

(viii) Operating profit variance. *(8 Marks) (Nov, 2006)*

Answer

	₹
(1) Budgeted contribution = Budgeted Profit + Budgeted Fixed Cost	15,000 + 15,000 = 30,000
Plus Contribution quantity variance	1,800

	Total Standard contribution		31,800
	Standard Contribution per unit		3
	Actual Sales Volume		10,600 units
(2)	Actual Sales Volume 10,600 × 17		1,80,200
(3)	Actual quantity of Raw Materials used		
	Standard consumption 10,600 × 5		53,000 Kgs.
	Add: Material Usage Variance $\frac{400}{.2}$		2,000 kgs.
	Actual consumption		55,000 Kgs.
(4)	Labour Efficiency variance		
	Standard labour cost for Standard hours	(63,000 + 600)	63,600
	Standard labour cost for actual hours		61,950
	Labour efficiency variance		1,650 F
(5)	Actual variable overhead		
	Variable OH at Std. Rate – Variable OH Variance	₹ 84,800 – ₹ 1,800 = ₹ 83,000	
(6)	Variable Overhead efficiency variance		
	Actual hours (AH)	$\frac{61,950}{15}$	41,300 hours
	Standard hours (SH)	10,600 × 4	42,400 hours
	Standard rate per hour (SR)	$\frac{63,600}{10,600 \times 4}$	₹ 1.5
	Efficiency variance SR (SH – AH) = 2 (42,400 – 41,300) = 2,200F		
(7)	Actual fixed overheads: Budgeted Overhead - Fixed Overhead variance = 15,000 - 600 (A) = ₹ 15,600.		
(8)	Operating profit variance		
	If budgeted profit is considered (15,000 – 7,000) = ₹ 8,000 adverse		
	If standard profit is considered (16,800 – 7,000) = ₹ 9,800 adverse		

Question 5

A company following standard marginal costing system has the following interim trading statement for the quarter ending 30th June, 2005, which reveals a loss of ₹ 17,000, detailed below:

		₹
Sales		*4,99,200*
Closing stock (at prime cost)		*18,000*
		5,17,200

Costs:		
Direct material	*1,68,000*	
Direct labour	*1,05,000*	
Variable overhead	*42,000*	
	3,15,000	
Fixed overhead	*1,20,000*	
Fixed Admn. Overhead	*40,000*	
Variable distribution Overhead	*19,200*	
Fixed selling Overhead	*40,000*	
	2,19,200	
Total costs		*5,34,200*
Loss		*17,000*

Additional information is as follows:

(i) Sales for the quarter were 1,200 units. Production was 1,400 units, of which 100 units were scrapped after complete manufacture. The factory capacity is estimated at 2,000 units.

(ii) Because of low production, labour efficiency during the quarter is estimated to be 20% below normal level.

You are required to analyse the above and report to the management giving the reasons for the loss. ***(13 Marks) (Nov., 2006)***

Answer

(i)

Details	Working	Amount (₹)
(1) Selling price	4,99,200 / 1,200	416
(2) Raw materials	1,68,000 / 1,400	120
Labour	1,05,000 / 1,750	60
[Equivalent units (1,400/80%)]		
Variable overhead	42,000 / 1,400	30

Total manufacturing cost		210
Distribution overheads	19,200 / 1,200	16
Total cost		226
Contribution		190
Total fixed cost: factory	1,20,000	
Administration	40,000	
Selling	40,000	2,00,000

(ii) Standard Profit for 1,200 units sold:

	₹	
Contribution	1,200 × 190	2,28,000
Less: Fixed costs		2,00,000
Profit		28,000

(iii) Reconciliation

	₹	
Budgeted profit	(2,000 × 190 – 2,00,000)	1,80,000
Less: Volume variance	800 × 190	1,52,000
Standard profit		28,000
Factors causing loss:		
Units scrapped	100 × 210	21,000
Labour inefficiency	350 × 60	21,000
Undervaluation of closing stock	100 × (210 – 180)	3,000
Actual profit		–17,000

Question 6

Under the single plan, record the journal entries giving appropriate narration, with indication of amounts of debits or credits alongside the entries, for the following transactions using the respective control A/c.

(i) Material price variance (on purchase of materials)

(ii) Material usage variance (on consumption)

(iii) Labour rate variance. *(6 Marks) (Nov, 2006)*

Answer

(i)	Dr. Material Control A/c	
	Dr. or Cr. Material Price Variance A/c	
	Cr. Creditors A/c	
	(Being price variance during purchase of materials)	
(ii)	Dr. WIP Control A/c	
	Dr. or Cr. Material Usage Variance A/c	
	Cr. Material Control A/c	
	(Being recording of usage variance at Standard cost of excess/under utilized quantity)	
(iii)	Dr. Wages Control A/c	
	Dr. or Cr. Labour Rate Variance A/c	
	Cr. Cash	
	(Being entry to record wages at standard rate)	

Question 7

A company produces a product X, using raw materials A and B. The standard mix of A and B is 1 : 1 and the standard loss is 10% of input.

You are required to compute the missing information indicated by "?" based on the data given below:

	A	B	Total
Standard price of raw material (₹/kg.)	24	30	
Actual input (kg.)	?	70	
Actual output (kg.)			?
Actual price ₹/kg.	30	?	
Standard input quantity (kg.)	?	?	
Yield variance (sub usage)	?	?	270(A)
Mix variance	?	?	?
Usage variance	?	?	?
Price variance	?	?	?
Cost variance	0	?	1300(A)

(14 Marks) (May 2007)

Answer

Computation of Yield Variance for 'A' and 'B'

DM yield variance for 'A' =

DM yield variance for 'A'	=	[	Std qty of all DM allowed for actual output	-	Actual total qty of all DM used	]	×	Std Mix %age of 'A'	× Std price of 'A'

= [SQ_A - RSQ_A] × Std price of 'A''

Where RSQ_A = Revised Standard Quantity of 'A' = (Actual total qty of all DM used) × Std Mix %age of 'A' and

SQ_A = Standard Quantity of DM 'A' for Actual Production = Standard quantity of all DM allowed for actual output × Std Mix %age of 'A'

DM yield variance for 'B'	=	[	Std qty of all DM allowed for actual output	-	Actual total qty of all DM used	]	×	Std Mix %age of 'B'	× Std price of 'B'

= [SQ_B - RSQ_B] × Std price of 'B'

Where RSQ_B = Revised Standard Quantity of 'B' = (Actual total qty of all DM used) × Standard Mix %age of 'B' and

SQ_B = Standard quantity of DM 'B' for Actual Production = Standard quantity of all DM allowed for actual output × Standard Mix %age of 'B'

Since Standard Mix %age is the same for both 'A' and 'B' (1:1) we have,

Total Yield variance for 'A' and 'B'= T × (Std price of 'A' + Std price of 'B')

Where T = (Std qty of all DM allowed for actual output - Actual total qty of all DM used) × 0.5

As Total Yield variance for 'A' and 'B' is given as – ₹ 270, we have

- ₹ 270 = T × ₹ 24 + T × ₹ 30

Or T = - 5

Hence Yield Variance for 'A' = - 5 × 24 = - ₹ 120 and

Yield variance for 'B' = - 5 × 30 = - ₹ 150.

Also

$(SQ_A - RSQ_A) \times 24 = -120$ or $SQ_A - RSQ_A = -5$

Similarly

$(SQ_B - RSQ_B) \times 30 = -150$ or $SQ_B - RSQ_B = -5$

Alternative 1

Let total actual quantity consumed; X kg.

Then, Quantity of A = X – 70

$RSQ = \frac{X}{2}$ of A & $\frac{X}{2}$ of B. (Since the Mix ratio is 1:1)

The Standard input for both 'A' and 'B' will be 0.5X – 5

Since Cost Variance for 'A' is given to be nil, we have,

$(SP_A \times SQ_A) - (AQ_A \times AP_A) = 0$

i.e. $24 \times (0.5\,X - 5) - (X - 70) \times 30 = 0$

or X = 110 Kgs

Therefore Actual Input for 'A' = 110 – 70 = 40 Kgs

Also, Standard Input for 'A' and 'B' will be $\left(\frac{110}{2} - 5\right)$ = 50 Kgs. Using this quantity in the Cost Variance of 'B' , the actual price per kg of 'B' (AP_B) will be ,

$50 \times 30 - 70 \times AP_B = -1{,}300$

Or AP_B = ₹ 40.

Alternative 2

Let the standard input of 'A' = X kg. Therefore, the total standard input for 'A' + 'B'= 2X

Actual input = (2X + 10) Kgs. ∴ Actual input for 'A' = (2X +10 – 70)= (2X – 60)Kgs

Forming the equation for nil cost variance of 'A'.

₹ $24 \times X$ – ₹ $30 \times (2X - 60) = 0$

Or X = 50 Kgs. Using this quantity in the Cost Variance of 'B', the actual price per kg. of 'B' (AP_B) will be ,

$50 \times 30 - 70 \times AP_B = -1{,}300$

Or AP_B = ₹ 40.

Alternative 3

Let the actual input of 'A' = X

Then the total actual input = (X + 70). Therefore, RSQ of 'A' and 'B' each = 0.5X + 35 and Standard Input of 'A' and 'B' each = 0.5X +30.

Forming the equation for nil cost variance of 'A', we have,

24 × (0.5X + 30) – 30 × X = 0

Or X = 40 Kgs.

∴Standard Input will be 50 Kgs. Using this, quantity in the Cost Variance of 'B', the actual price per kg. of 'B' (AP_B) will be,

50 × 30 – 70 × AP_B = –1,300

Or AP_B = ₹ 40.

Substituting various values for quantity and price, we get the following table.

	(1)	(2)	(3)	(4)
	Std. Price × SQ	Std. Price × RSQ	Std. Price × Actual Qty.	Actual Price × Actual Qty.
A	24 × 50 = 1200	24 × 55 = 1320	24 × 40 = 960	30 × 40 = 1200
B	30 × 50 = 1500	30 × 55 = 1650	30 × 70 = 2100	40 × 70 = 2800
	2700	2970	3060	4000

	(1) – (2)	(2) – (3)	(1) – (3)	(3) – (4)	(1) – (4)
	Yld variance	Mix variance	Usage variance	Price variance	Cost variance
A	1200 – 1320 = 120(A)	1320 – 960 = 360(F)	1200 – 960 = 240(F)	960 – 1200 = 240(A)	1200 – 1200 = 0
B	1500 – 1650 = 150(A)	1650 – 2100 = 450(A)	1500 – 2100 = 600(A)	2100 – 2800 = 700(A)	1500 – 2800 = 1300(A)
	270A)	90A)	360A)	940A)	1300A)

Actual Output = 90 Kgs.

(Actual output and standard output are always equal numerically in any material variance analysis)

Standard output = Standard input – Standard loss or 100 – 10 = 90 Kgs.

Question 8

The working results of a Software Company for two corresponding years are shown below:

	Amount (₹ in lakhs)	
	Year 2005	*Year 2006*
Sales (A)	*600*	*770*

Cost of Sales:		
Direct materials	*300*	*324*
Direct wages and variable overheads	*180*	*206*
Fixed overheads	*80*	*150*
Total (B)	*560*	*680*
Profit (A – B)	*40*	*90*

In year 2006, there has been an increase in the selling price by 10 per cent. Following are the details of material consumption and utilization off direct labour hours during the two years:

	Year 2005	*Year 2006*
Direct material consumption (M. tons)	*5,00,000*	*5,40,000*
Direct labour hours	*75,00,000*	*80,00,000*

Required:

(i) Taking year 2005 as base year, analyse the variances of year 2006 and also workout the amount which each variance has contributed to change in profit.

(ii) Find out the breakeven sales for both years.

(iii) Calculate the percentage increase in selling price in the year 2006 that would be needed over the sale value of year 2006 to earn margin of safety of 45 per cent. (19 Marks)(Nov 2007)

Answer

Working Notes:

(i) Budgeted sales in year 2006 = (100/110) × 770 = ₹ 700 lakhs

(ii) Budgeted direct material cost = (300/600) × 700 = ₹ 350 lakhs

(iii) Budgeted direct wages and variable overheads = (180/600) × 700 = ₹ 210 lakhs

(iv) Rate per M. ton of direct material: Year 2005 = (300/5) = ₹ 60

: Year 2006 = (324/5.40)= ₹ 60

(v) Material usage budget for the year 2006 = (5/600) × 700 = 5.83333 lakhs

(vi) Direct labour hours budget for the year 2006 = (75/600) × 700 = 87.50 lakhs

(vii) Direct labour and variable overheads rate per hour: Year 2005 = (180/75) = ₹ 2.40

Year 2006 = (206/80) = ₹ 2.575

(viii) Material price variance = (₹ 60 – ₹ 60) × 5,40,000 = zero

(ix) Material usage variance = (5.83333 – 5.40) × ₹ 60 = ₹ 26 lakhs (F)

(x) Labour and variable overheads rate variance =(2.40 – 2.575) × 80 = ₹14 lakhs (A)

(xi) Labour and variable overheads efficiency variance = (87.50 – 80.00) × ₹ 2.40 = ₹ 18 lakhs (F)

(xii) Fixed overheads expenditure variance = (150 – 80) = ₹ 70 lakhs (A)

(xiii) Statement of working results of the company

	Actuals	*Amount ₹ in lakhs*	
		Budget	*Variance*
	2006	*2006*	
Sales	770	700	70(F)
Less: Direct material	324	350	26(F)
Direct wages and variable overheads	206	210	4(F)
Contribution	240	140	100(F)
Less: Fixed overheads	150	80	70(A)
Profit	90	60	30(F)

I Reconciliation statement showing variances contribution to change in profit (₹ in lakhs)

	Favourable	*Adverse*
Increase in contribution due to volume	20	–
Sales price variance	70	–
Material usage variance	26	–
Material price variance	–	–
Direct labour and variable overheads rate variance	–	14
Direct labour and variable overheads efficiency variance	18	–
Fixed overheads expenditure variance	–	70
	134	84
Total change in profit (increase)	50	

II Break-even point

Year 2005 : (80/120) × 600 = ₹ 400 lakhs

Year 2006 : (150/240) × 770 = ₹ 481.25 lakhs

III Required percentage increase in selling price in the year 2006 to earn a margin of safety of 45%.

Break-even sales = (1 – 0.45) or 55 per cent of total sales.

Contribution at 55% sales = Fixed overheads = ₹ 150 lakhs.

Required contribution at total sales = ₹ 150/.55 = ₹ 272.73 lakhs

Additional contribution required = (272.73 – 240) = ₹ 32.73 lakhs

Percentage increase in selling price required = (32.73/770) × 100 = 4.25%.

Question 9

The following information has been extracted from the books of Goru Enterprises which is using standard costing system:

Actual output	=	*9,000 units*
Direct wages paid	=	*1,10,000 hours at ₹22 per hour, of which 5,000 hours, being idle time, were not recorded in production*
Standard hours	=	*10 hours per unit*
Labour efficiency variance	=	*₹3,75,000 (A)*
Standard variable Overhead	=	*₹150 per unit*
Actual variable Overhead	=	*₹16,00,000*

You are required to calculate:

(i) Idle time variance

(ii) Total variable overhead variance

(iii) Variable overhead expenditure variance

(iv) Variable overhead efficiency variance. *(May, 2008) (6 Marks)*

Answer

Actual output = 9,000 units

Idle time = 5,000 hours

Production time (Actual) = 1,05,000 hours

Standard hours for actual production = 10 hours / unit × 9,000 units = 90,000 hours.

Labour efficiency variance = 3,75,000 (A)

i.e. Standard rate × (Standard Production time – Actual production time) = 3,75,000(A).

SR (90,000 – 1,05,000) = – 3,75,000

$$SR = \frac{-3,75,000}{-15,000} = Rs.\,25$$

(i) Idle time variance = 5,000 hours × 25 ₹ / hour = 1,25,000. (A)

(ii) Standard Variable Overhead = ₹ 150 / unit

Standard hours = 10 hours / unit

Standard Variable Overhead rate / hour = 150 / 10 = ₹ 15 / hour

Total Variable Overhead variance = Standard Variable Overhead – Actual Variable Overhead

= Standard Rate × Standard hours – Actual rate × Actual hours

= (15) × (10 × 9,000) – 16,00,000

= 13,50,000 – 16,00,000

Total Variable Overhead Variance = 2,50,000 (A)

(iii) Variable Overhead Expenditure Variance = (Standard Rate × Actual Hours) – (Actual Rate × Actual Hours)

= (15 × 1,05,000) – 16,00,000

= 15,75,000 – 16,00,000

= 25,000 (A)

(iv) Variable Overhead Efficiency Variance = Standard Rate × (Standard Hours for actual output – Actual hours for Actual output)

= 15 (90,000 – 1,05,000)

= 15 (–15,000)

= 2,25,000 (A)

Alternative Solution

Actual Output = 9,000 Units

Idle time = 5,000 hrs

Direct Wages Paid = 1,10,000 hours @ ₹ 22 out of which 5,000 hours being idle, were not recorded in production.

Standard hours = 10 per unit.

Labour efficiency variance = ₹ 3,75,000 (A)

or

Standard Rate (Standard Time – Actual Time) = – 3,75,000

Or (90,000 – 1,05,000) = $\frac{-3,75,000}{\text{Standard Rate}}$

Or Standard Rate = ₹ 25/-

(i) Idle time variance = Standard Rate × Idle time

$25 \times 5{,}000 = ₹\ 1{,}25{,}000$ (A)

(ii) Standard Variable Overhead / unit = 150

Standard Rate = $\frac{150}{10} = ₹\ 15$/hour

Standard Quantity = 10 hours

Actual Variable Overhead = 16,00,000

Standard Variable Overhead = 150 × 9,000 = 13,50,000

Actual Variable Overhead = 16,00,000

Total Variable Overhead Variance = 2,50,000 (A)

(iii) Variable Overhead expenditure Variance = Standard Variable Overhead for actual hours – Actual Variable Overhead

= (150 × 1,05,000) – 16,00,000

= 15,75,000 – 16,00,000

= 25,000 (A)

(iv) Variable overhead efficiency variance = Standard Variable Overhead for actual output – Standard Variable Overhead for Actual hours)

= 15 (10 hours × 90,000 units – 1,05,000)

= 15 (90,000 – 1,05,000)

= 15 (–15,000)

= 2,25,000 (A)

Question 10

A manufacturing company has furnished the following financial data relating to the actual output of 9,600 units produced in the last quarter:

		₹
Sales		*4,45,500*
Costs:		
Direct Materials	*59,400*	
Direct Wages	*89,400*	
Variable Overheads	*1,45,500*	
Fixed Overheads	*78,000*	*3,72,300*
Profit		*73,200*

The standard wage rate is ₹ 4.50 per hour and the standard variable overhead rate is ₹ 7.50 per hour. The company uses a JIT system and the budgeted production and sales quantity is 10,000 units.

The following are the variances from standard costs recorded during the last quarter:

		₹
Direct materials	*Price V*	*600 A*
	Usage V	*1,200 A*
Direct Wages	*Rate V*	*1,500 F*
	Efficiency V	*4,500 A*
Variable Overheads	*Expense V*	*6,000 F*
	Efficiency V	*7,500 A*
Fixed Overheads	*Expense V*	*3,000 A*
Sales	*Price V*	*13,500 F*

You are required to:

(i) Prepare the Original budget and Standard cost sheet per unit of output;

(ii) Produce a statement reconciling the budgeted profit with actual profit.

(11 Marks) (Nov., 2008)

Answer

Direct Materials:

SQ AQ SP SQ × SP AQ × SP AP AQ × AP

59,400

Usage variance Price variance

1200 A 600 A

AQ × SP = 58,800[1]

SQ × SP = 57,600[2]

Standard cost of materials for actual output of 9,600 units = ₹ 57,600.

Hence, standard cost per unit is 57,600 / 9,600 = ₹ 6.

Direct Labour:

SH AH SR SH × SR AH × SR AR AH × AR

89,400

Efficiency variance Rate variance

4500 A 1500 F

AH × SR = 90,900[3]

SH × SR = 86,400[4]

Standard wage cost per unit is 86,400 / 9,600 = ₹ 9.

Standard wage rate is ₹ 4.50.

Standard time per unit is 9/4.5 = 2 hours.

Variable Overheads:

Standard rate is ₹ 7.50 per hour

Standard cost per unit is 2 hours × ₹ 7.50 = ₹ 15.

Fixed Overheads:

Actual units	9,600
Standard time / unit 2 hours	
Standard hours produced	9,600 × 2 = 19,200 hours
Actual overheads	78,000
Expense variance	3,000 A
Budgeted overheads	75,000
Budgeted units	10,000
Fixed overheads per unit	₹ 7.50.
Charged to Production: 9,600 × 7.50 =	₹ 72,000
Budgeted overheads	₹ 75,000
Volume variance	₹ 3,000 (A)

Sales:

SQ AQ SP SQ × SP AQ × SP AP AQ × AP

4,45,500

Price variance 13,500 F

AQ × SP = 4,32,000[5]

Actual units = 9,600

Standard price is 4,32,000 / 9,600 = ₹ 45 per unit.

Original Budget and Standard Cost Sheet:

	Budget	*Standard Cost*
Units budgeted	10,000	

Sales	4,50,000	45.00
Direct materials @ ₹ 6 per unit	60,000	6.00
Direct Wages	90,000	9.00
Variable Overheads @ ₹ 15 per unit	1,50,000	15.00
Fixed overheads @ ₹ 7.50 per unit	75,000	7.50
Total costs	3,75,000	37.50
Profit	75,000	7.50

Sales volume variance is (9,600 – 10,000) × 7.50 = ₹ 3,000 A

Reconciliation Statement:

Budgeted Profit	75,000
Sales volume variance	3,000 A
Standard profit	72,000
Sales price variance	13,500 F
Total	85,500

Cost variances:

		F	A	
Materials:	Price		600	
	Usage		1,200	
Direct Labour:	Rate	1,500		
	Efficiency		4,500	
Variable Overhead:	Efficiency		7,500	
	Expense	6,000		
Fixed Overhead:	Volume		3,000	
	Expense		3,000	
Total variances		7,500	19,800	12,300 A
Actual profit				73,200

Working Notes:

(1) Price Variance = [SP – AP] AQ

600 (A) = [SP × AQ – 59,400]

SP × AQ = 58,800.

(2) Usage Variance = [SQ × SP] – [AQ × SP]

1200 (A) = SQ × SP – 58,800

SQ × SP = 57,600.

(3) Rate Variance = [SR – AR] AH

1500 (F) = SR × AH – 89,400

SR × AH = 90,900.

(4) Efficiency Variance = [SH – AH] × SR

4500 (A) = SH × SR – 90,900

SH × SR = 86,400.

(5) Price Variance = (AP – SP) × AQ

13500 (F) = SP × AQ – 4,45,500

SP × AQ = 4,32,000.

Question 11

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	*42,000*	*(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	*4,000*	*(F)*
Actual profit	*86,720*	

Budgeted production and sales volumes for Mach, 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	*112.00*
	296.00
Standard profit	*24.00*
Standard selling price	*320.00*

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

(i) Budgeted volume $= \frac{\text{Budgeted profit}}{\text{Budgeted profit per unit}}$

$= \frac{2,40,000}{24.00}$

= 10,000 units

Difference between actual and budgeted volume $= \frac{\text{Fixed overhead volume variance}}{\text{Standard fixed overhead rate}}$

$= \frac{1,96,000}{112}$

= 1,750 units

Actual Production = Budgeted volume – Difference between actual and budget volume

= 10,000 – 1,750

= 8,250 units

(ii) Actual production = 8,250 units

Material quantity = 4 kg. × 8,250 = 33,000 kg.

Less: Difference in material use

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

Actual usages	31,400 kg.
Less: Decrease in stock	6,400 kg.
Actual purchases	25,000 kg.

(iii) Actual hours

8,250 units × 4 hours = 33,000 hours

Difference in actual and standard

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

Actual hours 34,000 hours

(iv) Actual variable overhead incurred:

Standard cost of variable overhead = 8,250 × 48	= ₹ 3,96,000
Total variable overhead cost variance [8,000 (F) + 12,000 (A)]	= ₹ 4,000 (A)
Actual variable overhead	= ₹ 4,00,000

(v) Actual fixed overhead:

Budgeted fixed overhead =

Budgeted units × Budgeted rate = 10,000 × 112	= ₹ 11,20,000
Expenditure variance	= ₹ 4,000 (F)
Actual fixed overhead	= ₹ 11,16,000

It can also be calculated as below:

Actual fixed overhead:

Standard fixed overhead = (Actual output × Standard fixed overhead rate per unit) 8,250 × 112	= ₹ 9,24,000
Total fixed overhead variance [1,96,000 (A) + 4,000 (F)]	= ₹ 1,92,000 (A)
Actual fixed overhead	= ₹ 11,16,000

(vi) Actual sales volume:

Sales volume variance = Standard profit per unit (Actual quantity of sales – Standard quantity of sales)

42,000 (A) = 24 (Actual Quantity of sales – 10,000)

Actual quantity of sales = 8,250 units

Alternative for (iv) and (v) points

(1) Variable overhead cost variance = (Standard hours for actual output × Standard variable overhead rate per hour) – Actual variable overhead cost

4,000 (A) = (4 × 8,250 × 12) – Actual variable overhead

Actual variable overhead = ₹ 4,00,000.

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

1,92,000 (A) = (4 × 8,250 × 28) – Actual fixed overheads.

Actual fixed overhead = ₹ 11,16,000.

Question 12

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 (₹)	*6*	*3*	*1*	-
Number of workers in actual gang				*9*
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:

(i) The number of workers in each category

(ii) Total gang variance

(iii) Total Sub-efficiency variance

(iv) Total labour rate variance

(v) 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	60	1×	80	80	1×	80	80	2×	80	160

1050	1400	1280	1320
Sub-efficiency Variance	Gang Variance		Rate Variance
350 (A)	120 (F)		40 (A)

Cost Variance = 270 (A)

Workings Note:

Standard hours produced = 270

Standard Mix : 270 ÷ 9 = 30

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

Actual hrs = 40 × 9 = 360 hrs.

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

[(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
	120	160	80
40 hr week			
∴ 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) × 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:

= (Standard Rate × Standard Hrs – Actual Rate × Actual Hrs.)

= 1050 – 1320 = 270 (A)

Question 13

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

	₹.
Direct materials :A 10 kg @ ₹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	*25.00*
Total Standard cost	*190.00*
Standard gross profit	*35.00*
Standard selling price	*225.00*

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	*4,50,000*
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	*56,600*
Total	*3,82,500*
Gross profit	*67,500*

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:

(i) Calculate all variances.

(ii) 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)(May 2010)***

Answer

(i) Material Price variance = (SP-AP) AQ

A = (5-5.25) x 20000 = 5000(A)

B (At the time of receipt of Materials) = (6.0-5.70) 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 x25 – 56600) = 6600 (A)
Fixed overhead exp. Variance	= Budgeted overhead – Actual overhead
	= (25200 /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	
	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	
		12566.67	15116.67	2550 (A)
Actual Profit				67450

(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.

MPV A = 18900 x (5-5.25) = 4725 (A)

B = 10750 x (6-5.70) = 3225 (F)

1500 (A)

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

Question 14

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 :

(i) Calculate efficiency, activity, calendar and standard capacity usages ratio.

(ii) Calculate all the relevant fixed overhead variances.

(iii) Calculate variable overheads expenditure and efficiency variance.(10 Marks)(Nov., 2010)

Answer

Ratio	Working	Result
Efficiency Ratio	Output expressed in Standard Hours / Actual Hours Worked	(22550/20500)*100 = 110%
Activity Ratio	Output expressed in Standard Hours / Budgeted output in standard hours	(22550/25920)*100 = 87% or 86.99 %
Calender Ratio	Actual Working days in a period / No. of working days in related budget period	(23/24)*100 = 96%
Standard Capacity usage ratio	Budget Hours / Maximum No. of hours in related period	(25920/28800)*100 = 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 Actual Hours	Actual Hours X Actual Rate
(1)	(2)	(3)
(90720/25920)*22550	(90720/25920)*20500	Given
₹ 78925	₹ 71750	₹ 70870

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

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)

Question 15

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	BP	BC	BM	AM
A	6000	7200	8000	12	14	8	6	4
B	9000	10800	10000	16	13	10	3	6
	15000	18000						

Sales Margin Mix Variance:

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

A : (7,200 – 8,000) x 6 = - 4,800 (Fav)

B : (10,800 – 10,000) x 3 = 2,400 (Adv)

Total Mix Variance = - 2,400 (Fav)

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

A	8,000 (6 – 4)	=	16,000 (A)
B	10,000 (3 – 6)	=	30,000 (F)
	Total Price Variance	=	14,000 (F)

Question 16

The budget and actual operating data for 2010-11 pertaining to 4 products in a store are given below:

	Budgeted data for 2010-11			Actual operating results in 2010-11		
Product	Gallons	Selling price (₹ per gallon)	Variable costs (₹ per gallon)	Gallons	Selling price (₹ per gallon)	Variable costs (₹ per gallon)
V	2,50,000	1.2	0.5	1,80,000	1.00	0.45
C	3,00,000	1.5	0.6	2,70,000	1.35	0.50
S	2,00,000	1.8	0.7	3,30,000	2.00	0.75
A	50,000	2.5	1.00	1,80,000	3.00	1.20

You are required to compute for the individual products and in total:

(i) the sales margin price variance

(ii) the sales margin mix variance and

(iii) the sales margin volume variance

Indicate whether the variances are favorable (F) or unfavorable (A or U)

(10 Marks)(Nov.,2011)

Answer

Working Notes:

Product	Budget Margin (BM) Budgeted Price – Budgeted Variable Cost	Actual Margin (AM) Actual Price – Budgeted Variable Cost
V	1.2 – 0.5 = 0.7	1 - 0.5 = 0.5
C	1.5 – 0.6 = 0.9	1.35 – 0.6 = 0.75
S	1.8 – 0.7 = 1.1	2.0 – 0.7 = 1.3
A	2.5 – 1.0 = 1.5	3.0 – 1.0 = 2.0
	Actual Quantity x Actual Margin (1)	Actual Quantity x Budgeted Margin (2)
V	1,80,000 x 0.5 = 90,000	1,80,000 x 0.7 = 1,26,000
C	2,70,000 x 0.75 = 2,02,500	2,70,000 x 0.9 = 2,43,000
S	3,30,000 x 1.3 = 4,29,000	3,30,000 x 1.1 = 3,63,000
A	1,80,000 x 2.0 = 3,60,000	1,80,000 x 1.5 = 2,70,000
	9,60,000 = 10,81,500	9,60,000 = 10,02,000

	Actual Qty in Budgeted mix x Budgeted Margin (3)	Budgeted Quantity x Budgeted Margin (4)
V	3,00,000 x 0.7 = 2,10,000	2,50,000 x 0.7 = 1,75,000
C	3,60,000 x 0.9 = 3,24,000	3,00,000 x 0.9 = 2,70,000
S	2,40,000 x 1.1 = 2,64,000	2,00,000 x 1.1 = 2,20,000
A	60,000 x 1.5 = 90,000	50,000 x 1.5 = 75,000
	9,60,000 8,88,000	8,00,000 = 7,40,000

	Sales Margin – Price Variance (5) = (1) – (2)	Sales Margin Mix Variance (6) = (2) - (3)	Sales Margin Volume Variance (7) = (2) – (4)
V	36,000 (A)	84,000 (A)	49,000 (A)
C	40,500 (A)	81,000 (A)	27,000 (A)
S	66,000 (F)	99,000 (F)	1,43,000 (F)
A	90,000 (F)	1,80,000 (F)	1,95,000 (F)
	79,500 (F)	1,14,000 (F)	2,62,000 (F)

Question 17

The standard set for a chemical mixture of a company is as under:

Material	*Standard Mix(%)*	*Standard Price `/Kg*
A	*80*	*50*
B	*20*	*100*

Standard yield in production is 75 %.

The actual quantity produced was 1800 kg of output from the following:

Material	*Quantity (kg)*	*Actual Price*
A	*1400*	*60*
B	*600*	*90*

Calculate the total material price, mix and yield variances, indicating whether they are favorable (F) or adverse (A or U). ***(6 Marks)(May,2012)***

Answer

	(I) SP x SQ	(II) SP x RSQ	(III) SP x AQ	(IV) AQ x AP
A	50*1920 =	50*1600 =	50*1400 =	1400*60=
B	100*480 =	100*400 =	100*600 =	600*90 =
TOTAL	1,44,000	1,20,000	1,30,000	1,38,000

SP- Standard Price per Kg, SQ- Standard Quantity for actual production

RSQ- Revised Standard Quantity, AQ- Actual Quantity used, AP- Actual Price per kg.

Variances : (Figures ₹)

Variances	Material Yield Variance (I–II)	Material Mix Variance (II-III)	Material Price Variance (III-IV)
A	16,000 F	10,000 F	14,000 A
B	8,000 F	20,000 A	6,000 F
TOTAL	24,000 F	10,000 A	8,000 A

Note : Standard Input = 1800 / 0.75 = 2,400 kgs. Hence Standard quantity of A is 2,400 * 0.8 = 1920 kgs and B = 2400 * 0.2 = 480 kgs.

Question 18

Sunglow Limited manufactures and sells a single product. From the records of the company the following information is available for November 2012:

The standard cost comprises the following:

Direct material	*Unit*	*₹*
X	*8*	*320*
Y	*24*	*1,680*
Z	*16*	*400*
		2,400
Direct wages (` 40 per hour)		*1,600*
Variable overhead (25% of direct wages)		*400*
Fixed overhead (based on budgeted production of 10,000 units of the final product per month)		*600*
		5,000

The budgeted selling price is ₹ 700 each and the budgeted sales for the month were 14,000 units.

The following were the transactions for the month:

Direct material:	*Units*	*Purchased Price per unit*	*Issued unit*
X	*44,000*	*42*	*82,400*
Y	*1,40,000*	*71*	*2,46,400*
Z	*60,000*	*24*	*1,64,000*

Direct Wages:	*₹ 90,00,000 (3,98,000 hours)*
Overheads:	
Variable	*₹ 2,00,000*
Fixed	*₹ 3,00,000*
Production:	*11,000 units*
Sales:	*9,000 units at ₹ 700 each and 3,500 units at ₹ 750 each*

Required:

Calculate (i) Material price variance; (ii) Material mix variance; (iii) Labour rate variance (iv) Labour efficiency variance (v) Variable overhead efficiency variance; and (vi) Fixed overhead efficiency variance. ***(9 Marks)(Nov., 2012)***

Answer

(a) Statement showing 'Standard Cost of Material' and 'Actual Cost of Material'- Production 11,000 units

Direct Material	Standard Cost			Actual Cost			Revised Actual Quantity*
Type	Quantity	Rate	Amount	Quantity Consumed	Rate	Amount	
X	88,000 Units (11,000 x 8)	₹ 40 (320/8)	₹ 35,20,000	44,000 Units 38,400 Units	₹ 42 ₹ 40	₹ 33,84,000	82,133 Units [4,92,800 / 5,28,000 x 88,000]
Y	2,64,000 Units (11,000 x 24)	₹ 70 (1,680/24)	₹ 1,84,80,000	1,40,000 Units 1,06,400 Units	₹ 71 ₹ 70	₹ 1,73,88,000	2,46,400 Units [4,92,800 / 5,28,000 x 2,64,000]
Z	1,76,000 Units (11,000 x 16)	₹ 25 (400/16)	₹ 44,00,000	60,000 Units 1,04,000 Units	₹ 24 ₹ 25	₹ 40,40,000	1,64,267 Units [4,92,800 / 5,28,000 x 1,76,000]
Total	5,28,000 Units		₹ 2,64,00,000	4,92,800 Units		₹ 2,48,12,000	4,92,800 Units

* Actual Quantity in Standard Proportion.

Statement showing 'Standard Cost of Wages' and 'Actual Cost of Wages'- Production 11,000 units

Standard Cost			Actual Cost		
Hours	Rate	Amount	Hours	Rate	Amount
4,40,000 hrs [11,000 x (1,600/40)]	₹ 40	₹ 1,76,00,000	3,98,000 hrs	₹ 22.613 (Appx.)	₹ 90,00,000

(i) Material Price Variance = Actual Quantity x Std. Price – Actual Cost

Material 'X' = 82,400 Units x ₹ 40 – ₹ 33,84,000

= ₹ 88,000 (A)

Material 'Y' = 2,46,400 Units x ₹ 70 – ₹ 1,73,88,000

= ₹1,40,000 (A)

Material 'Z' = 1,64,000 Units x ₹ 25 – ₹ 40,40,000

= ₹ 60,000 (F)

Total = ₹ 88,000 (A) + ₹ 1,40,000 (A) + ₹ 60,000 (F)

= ₹ 1,68,000 (A)

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

Material 'X' = ₹ 40 x (82,133 units – 82,400 units)

= ₹ 10,680 (A)

Material 'Y' = ₹ 70 x (2,46,400 units – 2,46,400 units)

= ₹ 0

Material 'Z' = ₹ 25 x (1,64,267 units – 1,64,000 units)

= 6,675 (F)

Total = ₹ 10,680 (A) + ₹ 0+ ₹ 6,675 (F)

= ₹ 4,005 (A)

(iii) Labour Rate Variance = Actual hours x (Std. Rate – Actual Rate)

= 3,98,000 hrs x (₹ 40 – ₹ 22.613)

= ₹ 69,20,000 (F)

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

= ₹ 40 x (4,40,000 hrs. – 3,98,000 hrs.)

= ₹ 16,80,000 (F)

(v) Variable Overhead Efficiency Variance

= Std. Rate per Hour x (Standard Hours for Actual Production– Actual Hours)

= (₹ 400/40 hrs.) x [(11,000 units x 40 hrs.) – 3,98,000 hrs.)]

= ₹ 4,20,000 (F)

(vi) Fixed Overhead Efficiency Variance

= Std. Rate per Hour x (Standard Hours for Actual Production– Actual Hours)

= (₹ 600/40 hrs.) x [(11,000 units x 40 hrs.) – 3,98,000 hrs.)]

= ₹ 6,30,000 (F)

☞ It is assumed that Opening Inventory is valued at Standard Cost.

Question 19

The following are the information regarding overheads of a company:

(a) Overheads cost variance = ₹2,800 (A)

(b) Overheads volume variance = ₹2,000 (A)

(c) Budgeted overheads = ₹ 12,000

(d) Actual overhead recovery rate = ₹8 per hour

(e) Budgeted hours for the period =2,400 hours

You are required to compute the following:

(i) Overheads expenditure variance.

(ii) Actual incurred overheads.

(iii) Actual hours for actual production.

(iv) Overheads capacity variance.

(v) Overheads efficiency variance.

(vi) Standard hours for actual production. (8 Marks)(May, 2013)

Answer

Overheads Cost Variance = ₹ 2,800 (A)

Overheads Volume Variance = ₹ 2,000 (A)

Budgeted Overheads = ₹ 12,000

Actual Overhead Recovery Rate = ₹ 8 per hour

Budgeted Hours *for the period* = 2,400 hours

(i) Overheads Expenditure Variance = Overheads Cost Variance (-)

Overheads Volume Variance

= ₹ 2,800 (A) - ₹ 2,000 (A)

= ₹ 800 (A)

(ii) Overheads Expenditure Variance = Budgeted Overheads (-) Actual Overheads

⇒ ₹ 800(A) = ₹ 12,000 (-) Actual Overheads

Therefore, Actual Overheads = ₹ 12,800

(iii) Actual hours for actual production $= \frac{\text{Actual Overheads}}{\text{Actual Overhead Recovery Rate Per Hour}}$

$= \frac{₹12,800}{₹8}$

= 1,600 hours

For (iv), (v) & (vi) refer Working Note

(iv) Overheads Capacity Variance = Budgeted Overheads for Actual Hours (-) Budgeted Overheads

= ₹ 5 x 1,600 hrs. - ₹ 12,000

= ₹ 8,000 - ₹ 12,000

= ₹ 4,000 (A)

(v) Overheads Efficiency Variance = Absorbed Overheads (-) Budgeted Overheads for Actual Hour

= ₹ 10,000 - ₹ 5 x 1,600 hours = ₹ 2,000 (F)

(vi) Standard hours for actual production

$= \frac{\text{AbsorbedOverheads}}{\text{Standard Overhead Rate per hour}}$

$= \frac{₹10,000}{₹5} = 2,000$

Working Notes:

Overhead Cost Variance = Absorbed Overheads (-) Actual Overheads

⇒ ₹ 2,800 (A) = Absorbed Overheads (-) ₹12,800

Therefore, Absorbed Overheads = ₹10,000

Standard Rate *per hour* $= \frac{\text{BudgetedOverheads}}{\text{Budgeted Hours}} = \frac{₹\ 12,000}{2,400\text{hours}} = ₹\ 5$

Question 20

The following information relates to the labour element of X Ltd.

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

In a 40 hour 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:

(i) The number of workers in each category

(ii) Total gang variance

(iii) Total sub-efficiency variance

(iv) Total labour rate variance

Indicate if the variances are Favourable (F) or Adverse (A or U). *(8 Marks)(Nov., 2013)*

Answer

Working Note

Computation of Standard Hours Category Wise

Category	No. of Workers	Standard Hours
Skilled	4	120 $\left(270\text{ hrs.} x \frac{4\text{ workers}}{9\text{ workers}}\right)$
Semi-Skilled	3	90 $\left(270\text{ hrs.} x \frac{3\text{ workers}}{9\text{ workers}}\right)$
Un-Skilled	2	60 $\left(270\text{ hrs.} x \frac{2\text{ workers}}{9\text{ workers}}\right)$
Total	9	270

Computation of Actual Hours Category Wise

Semi-Skilled Workers

Labour Rate Variance = Standard Cost of Actual Time – Actual Cost

Or = Standard Rate × Actual Hours – Actual Rate × Actual Hours

Or = Actual Hours × (Standard Rate – Actual Rate)

$\Rightarrow$ ₹ 160 (F) = Actual Hours × (₹ 3 – ₹ 2)

$\Rightarrow$ Actual Hours = 160 Hours

(i) Computation of Total No. of Workers in Each Category

Category	No. of Workers	Actual Hours
Skilled	3 $\left(\frac{120\,hrs.}{40\,hrs.}\right)$	120 (Balancing Figure)
Semi-Skilled	4 $\left(\frac{160\,hrs.}{40\,hrs.}\right)$	160 (Working Note)
Un-Skilled	2 $\left(\frac{80\,hrs.}{40\,hrs.}\right)$	80 $\left(\frac{160\,hrs.}{2}\right)$
Total	9	360*

(*) Total No. of Actual Hours is 360 hrs. (40 hrs. x 9 workers)

(ii), (iii), & (iv)

Computation of Variances

Statement Showing Standard & Actual Cost

Category	Standard Cost			Actual Cost			Revised Actual Hrs. (In Std. Proportion)
	Hrs.	Rate	Amt.	Hrs.	Rate	Amt.	
Skilled	120	6	720	120	7	840	160 $\left(360hrs.x\frac{120hrs.}{270hrs.}\right)$
Semi-Skilled	90	3	270	160	2	320	120 $\left(360hrs.x\frac{90hrs.}{270hrs.}\right)$
Un-Skilled	60	1	60	80	2	160	80 $\left(360hrs.x\frac{60hrs.}{270hrs.}\right)$

Total	270		1,050	360		1,320	360

Total Gang Variance = Total Actual Time *Worked* (hours) × {*Average* Standard Rate *per hour* of Standard Gang

Less *Average* Standard Rate *per hour* of Actual Gang[@]}

[@]*on the basis of hours worked*

$$= 360 \text{ hrs.} \times \left(\frac{₹1,050}{270 \text{ hrs.}} - \frac{₹\ 6x120 \text{ hrs.} + ₹\ 3x160 \text{ hrs.} + ₹\ 1x80 \text{ hrs.}}{360 \text{ hrs.}} \right)$$

= ₹120 (F)

Alternate Formula

Gang Variance = Standard Cost of Actual Time *Worked* in Standard Proportion – Standard Cost of Actual Time Worked

Or = Revised Actual Hours × Standard Rate – Actual Hours × Standard Rate

Or = Standard Rate × (Revised Actual Hours - Actual Hours)

Skilled Workers = ₹6 × (160 hrs. – 120 hrs)

= ₹240 (F)

Semi-Skilled Workers = ₹3 × (120 hrs. – 160 hrs)

= ₹120 (A)

Skilled Workers = ₹1 × (80 hrs. – 80 hrs)

= ₹ 0

Total = ₹ 240 (F) + ₹ 120 (A) + ₹ 0

= ₹ 120 (F)

Total Sub- Efficiency Variance

= *Average* Standard Rate *per hour* of Standard Gang × {Total Standard Time (hours) Less Total Actual Time *Worked* (hours)}

$$= \left(\frac{₹1,050}{270 \text{ hrs.}} \right) x (270 \text{ hrs.} - 360 \text{ hrs.})$$

= ₹350 (A)

Alternate Formula

Sub- Efficiency Variance

	=	Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time *Worked* in Standard Proportion
Or	=	Standard Hours x Standard Rate – Revised Actual Hours × Standard Rate
Or	=	Standard Rate × (Standard Hours – Revised Actual Hours)
Skilled Workers	=	₹6 × (120 hrs. – 160 hrs.)
	=	₹240 (A)
Semi-Skilled Workers	=	₹3 × (90hrs. – 120 hrs.)
	=	₹90 (A)
Skilled Workers	=	₹1 × (60 hrs. – 80 hrs.)
	=	₹20 (A)
Total	=	₹240 (A) + ₹90 (A) + ₹20 (A)
	=	₹350 (A)
Labour Rate Variance		
	=	Standard Cost of Actual Time – Actual Cost
Or	=	Standard Rate × Actual Hours – Actual Rate × Actual Hours
Or	=	Actual Hours × (Standard Rate – Actual Rate)
Skilled Workers	=	120 hrs. × (₹6 – ₹7)
	=	₹120 (A)
Semi- Skilled Workers	=	160 hrs. × (₹3 – ₹2)
	=	₹160 (F)
Skilled Workers	=	80 hrs. × (₹1 – ₹2)
	=	₹80 (A)
Total	=	₹120 (A) + ₹160 (F) + ₹80 (A)
	=	₹40 (A)

Question 21

RST Ltd. has provided the following summarized results for two years:

	Year ended (₹ In lacs)	
	31-03-2013	*31-3-2014*
Sales	*3,000*	*3,277.50*
Material	*2,000*	*2,357.50*
Variable overheads	*500*	*525.00*
Fixed overheads	*300*	*367.50*
Profit	*200*	*27.50*

During the year ended 31-3-2014 sale price has increased by 15% whereas material and overhead prices have increased by 15% and 5% respectively. You are required to analyse the variances of revenue and each element of cost over the year in order to bring out the reasons for the change in profit. Present a profit reconciliation statement starting from profits in 2012-13 showing the factors responsible for the change in profits in 2013-14. (10 Marks) (May, 2014)

Answer

Statement Showing Reconciliation Between

Budgeted Profit [F.Y. 2012-13] & Actual Profit [F.Y. 2013-14]

Particulars	(₹ in lacs)	(₹ in lacs)
Budgeted Profit		200.00
Sales Margin Variances:		
Price	427.50 (F)	
Volume	10.00 (A)	417.50 (F)
Direct Material Variances:		
Price	307.50 (A)	
Usage	150.00 (A)	457.50 (A)
Variable Overheads Variances:		
Expenditure	25.00 (A)	
Efficiency	25.00 (A)	50.00 (A)
Fixed Overheads Variances:		
Expenditure	67.50 (A)	
Volume	15.00 (A)	82.50 (A)
Actual Profit		27.50

Computation of Variances (₹ In Lacs)

Sales Variances

Price Variance	=	Actual Sales – Standard Sales
	=	₹3,277.50 – ₹2,850.00
	=	₹427.50 (F)
Volume Variance	=	Standard Sales – Budgeted Sales
	=	₹2,850.00 – ₹3,000.00
	=	₹150 (A)

Sales Margin Variances

Sales Margin Price Variance	=	Sales Price Variance
	=	₹427.50 (F)
Sales Margin Volume Variance	=	Sales Volume Variance × Budgeted Net Profit Ratio
	=	$₹150 \text{ (A)} \times \left(\frac{₹200}{₹3,000}\right)$
	=	₹10 (A)

Material Variances

Material Price Variance	=	Standard Cost of Actual Quantity – Actual Cost
	=	₹2,050.00 – ₹2,357.50
	=	₹307.50 (A)
Material Usage Variance	=	Standard Cost of Standard Quantity for Actual Output – Standard Cost of Actual Quantity
	=	₹1,900 – ₹2,050
	=	₹150 (A)

Variable Overhead Variances

Expenditure Variance Actual	=	Budgeted Variable Overheads for Actual Hours – Variable Overheads
		Or
	=	Std. Rate *per unit* × Expected Output for Actual Hours Worked – Actual Variable Overheads
	=	₹500 – ₹525
	=	₹25 (A)

Efficiency Variances = Standard Variable Overheads for Production – Budgeted Variable Overheads for Actual Hours

Or

= Std. Rate *per unit* × Actual Output – Std. Rate *per unit* × Expected Output for Actual Hours Worked

= ₹475 – ₹500

= ₹25 (A)

Fixed Overhead Variances

Expenditure Variance = Budgeted Fixed Overheads – Actual Fixed Overheads.

= ₹300.00 – ₹367.50

= ₹67.50 (A)

Volume Variance = Absorbed Fixed Overheads – Budgeted Fixed Overheads

= ₹285 – ₹300 = ₹15 (A)

Working Notes (₹ in lacs)

Note-1:

Sales in F.Y. 2013-2014	3,277.50
Less: Increase due to *price rise* [₹3,277.50 lacs × 15/115]	427.50
Sales in F.Y. 2013-2014 at F.Y. 2012-2013 Prices [Standard Sales]	2,850.00
Sales in F.Y. 2012-2013	3,000.00
Fall in Sales in F.Y. 2013-2014 [₹3,000 lacs − ₹2,850 lacs]	150.00
Percentage fall	5%

Note-2:

Material Cost In F.Y. 2012-2013	2,000.00
Less: 5% for Decrease in Volume	100.00
'Standard Material Usage' at F.Y. 2012-13 Prices (Standard Cost of Standard Quantity for Actual output)	1,900.00
Actual Material Cost F.Y. 2013-2014 *Less:* 15% Increase in Prices [₹2,357.50 lakhs × 15/115]	2,357.50 307.50
Actual Materials Used, at F.Y. 2012-2013 Prices (Standard Cost of Actual Quantity)	2,050.00

Note-3:

Variable Overheads Cost in F.Y. 2012-13	500.00
Less: 5% due to fall in Volume of Sales in F.Y. 2013-14	25.00
"Standard Overheads for Production" in F.Y. 2013-14	475.00
Actual Variable Overheads Incurred in F.Y. 2013-14	525.00
Less: 5% for Increase in Price [₹525 lacs × 5 / 105]	25.00
Amount Spent in F.Y. 2013-14 at F.Y. 2012-13 Prices (Budgeted Variable Overheads for Actual Hours)	500.00

Note-4:

Fixed Overheads Cost in F.Y. 2012-13	300.00
Less: 5% due to fall in Volume of Sales in F.Y. 2013-14	15.00
"Standard Overheads for Production" in F.Y. 2013-14. (Absorbed Fixed Overheads)	285.00

☞ This question can also be solve by 'Contribution' approach.

Question 22

Compute the missing data, indicated by question marks from the following:

Particulars	*Product A*	*Product B*
Standard price per unit (₹)	*24*	*30*
Actual price per unit (₹)	*30*	*40*
Standard input (kg)	*50*	*??*
Actual input (kg)	*??*	*70*
Material price variance	*??*	*??*
Material usages variance (₹)	*??*	*600 (A)*
Material cost variance	*??*	*??*

Material Mix variance for both products together was ₹90 adverse.

(7 Marks) (November, 2014)

Answer

Workings for Finding - Missing Figures

Statement Showing Standard & Actual Cost (Incomplete)

Material	Standard			Actual		
	Qty. [SQ] (Kg.)	Price [SP] (₹)	Amount [SQ x SP] (₹)	Qty. [AQ] (Kg.)	Price [AP] (₹)	Amount [AQ x AP] (₹)
A	50	24	1,200	??	30	??
B	??	30	??	70	40	2,800
	??		??	??		??

Standard Input (Kg.) for Product 'B'-

Let 'T' Kgs. be the Standard Quantity of Input for Product B

Material Usage Variance = (SQ × SP) – (AQ × SP)

Or

= (SQ – AQ) × SP

For Product B:

₹600 (A) = (T Kgs. – 70 Kgs.) × ₹30

⇒ –600 = 30T – 2,100

⇒ 30T = 1,500

⇒ T = 50 Kg.

Hence Standard Quantity of input for product B is 50Kg.

Actual Input (Kg.) for Product 'A'-

Let 'N' Kg. be the Actual Quantity of Input for Product A

Material Mix Variance = Std. Price × (Actual Quantity in Std. Proportion – Actual Quantity)

Or

Material Mix Variance (A+B)

= Material Mix Variance (A) + Material Mix Variance (B)

$$\Rightarrow -90 = \left[₹24\left\{\left(\frac{N+70}{2}\right)-N\right\}+₹30\left\{\left(\frac{N+70}{2}\right)-70\right\}\right]$$

$$\Rightarrow -90 = \left[₹24\left\{\left(\frac{N+70-2N}{2}\right)\right\}+₹30\left\{\left(\frac{N+70-140}{2}\right)\right\}\right]$$

⇒ – 90 = 840 – 12N + 15N – 1,050

$\Rightarrow$ – 90 = 3N – 210

$\Rightarrow$ 3N = 120

$\Rightarrow$ N = 40 Kg.

Statement Showing Standard & Actual Cost (Complete)

Material	Standard			Actual		
	Qty. [SQ] (Kg.)	Price [SP] (₹)	Amount [SQ × SP] (₹)	Qty. [AQ] (Kg.)	Price [AP] (₹)	Amount [AQ × AP] (₹)
A	50	24	1,200	40	30	1,200
B	50	30	1,500	70	40	2,800
	100		2,700	110		4,000

Computation of Variances of Product A

Material Price Variance = Standard Cost of Actual Quantity – Actual Cost

= (SP × AQ) – (AP × AQ)

Or

= (SP – AP) × AQ

= (₹24.00 – ₹30.00) × 40 Kg.

= ₹240 (A)

Material Usage Variance = Standard Cost of Standard Quantity for Actual Production – Standard Cost of Actual Quantity

= (SQ × SP) – (AQ × SP)

Or

= (SQ – AQ) × SP

= ₹24.00 × (50 Kg. – 40 Kg.)

= ₹240 (F)

Total Material Cost Variance = Standard Cost – Actual Cost

= (SQ × SP) – (AQ × AP)

= ₹1,200 – ₹1,200

= ₹0

Computation of Variances of Product B

Material Price Variance = Standard Cost of Actual Quantity – Actual Cost

= (SP × AQ) – (AP × AQ)

Or

= (SP – AP) × AQ

= (₹30.00 – ₹40.00) × 70 Kg.

= ₹700 (A)

Total Material Cost Variance = Standard Cost – Actual Cost

= (SQ × SP) – (AQ × AP)

= ₹1,500 – ₹2,800

= ₹1,300(A)

Calculation as well as Presentation may be different. However, there will be no change in final answer.