

STANDARD COSTING

BASIC CONCEPTS AND FORMULAE

Basic Concepts

6.1 Meaning of Variance Analysis

Variance analysis is the analysis of the cost variances into its component parts with appropriate justification of such variances, so that we can approach for corrective measures

6.2 Variances of Efficiency

Variances due to the effective or ineffective use of materials quantities, labour hours, once actual quantities are compared with the predetermined standards.

6.3 Variances of Price Rates

Variances arising due to change in unit material prices, standard labour hour rates and standard allowances for indirect costs.

6.4 Variances Due to Volume

Variance due to the effect of difference between actual activity and the level of activity assumed when the standard was set.

6.5 Purpose of Standard Costing

Standard Costing main purpose is to

- Investigate the reasons
- Identify the problems
- Take corrective action.

6.6 Reasons for Each Type Of Variances And The Suggested Course Of Action

Type of Variance	Reasons of Variance	Suggestive Course of Action
MATERIAL		
Material	• Change in Basic Price	• Departmental head should take necessary action to

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Price	Fail to purchase the anticipated standard quantities at appropriate price	- purchase at right point of time - Cash discount or interest rate for payment of purchase should be consider at the time of such payment - Price check on the purchase of standard quality materials
Material Usage	- Use of sub-standard material - Ineffective use of materials - Pilferage - Non standardised mix	- Regular Inspection of quality of materials - Proper training of operators - Ensure best utilisation of resources
LABOUR		
Labour Efficiency	- Change in design and quality standard - Poor working conditions - Improper scheduling	- Proper planning - Proper training - Healthy working environment - Timelines for achieving set targets
Labour Rate	- Improper placement of labour - Increments / high labour wages - Overtime	- Time Scheduling for work performance - Proper job allocation according to capabilities of workers
OVERHEADS		
Manufacturing	- Improper planning - Under or over absorption of fixed overheads - Reduction of sales - Breakdowns - Power failure - Labour Trouble	- Efficient planning for better Capacity utilization - Check on expenditure
Selling and Distribution	- Increase in delivery cost - Increase in stock holding period	- Sales quotas - Sale Targets

	• Overtime	
Administrative	• Over expenditure	• Comparison of budgets with actuals • Introduction of Operating costing • Introduction of cost ratios
SALES		
Sales Value	• Change in Price • Change in Market Size • Change in Market Share	• Better Price Decision • Improved Strategic Planning

Basic Formulas

1. Material Variance

1.1 Material costs variance = (Standard quantity x Standard Price) – (Actual quantity x Actual price)

$$MCV = (SQ \times SP) - (AQ \times AP)$$

1.2 Material price variance = Actual quantity x (Standard price – Actual price)

$$MPV = AQ \times (SP - AP)$$

1.3 Material usage variance = Standard price (Standard quantity – Actual quantity)

$$MUV = SP \times (SQ - AQ)$$

Check:

1.4 Material cost variance = Material usage variance + Material price variance

$$MCV = MUV + MPV$$

Classification of Material Usage Variance

Material usage variance is further sub-divided into:

- i) Material mix variance
- ii) Material yield variance. (Or Material sub-usage variance)

1.5 Material mix variance = (Revised standard quantity – Actual quantity) x Standard price

$$MMV = (RSQ - AQ) \times SP$$

Where

Revised standard quantity =

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$$\frac{\text{Standard quantity of one material}}{\text{Total of standard quantities of all materials}} \times \text{Total of actual quantities of all materials}$$

1.6 Material revised usage variance = (Standard quantity – Revised standard quantity) × Standard price

$$\text{MRUV} = (\text{SQ} - \text{RSQ}) \times \text{SP}$$

1.7 Material yield variance = (Actual yield – Standard yield) × Standard output price

$$\text{MYV} = (\text{AY} - \text{SY}) \times \text{SOP}$$

Check:

Material usage variance = Material mix variance + Material yield variance

$$\text{MUV} = \text{MMV} + \text{MYV}$$

Or

1.8 Material usage variance = Material mix variance + Material revised usage variance

$$\text{MUV} = \text{MMV} + \text{MRUV}$$

Note: Material revised usage variance is also known as material sub – usage variance.

In each case there will be only one variance either material yield or material revised usage variance.

2. Labour Variance

2.1 Labour Cost variance = (Std. hours for actual output × Std. rate per hour) – (Actual hours × Actual rate per hour)

$$\text{LCV} = (\text{SH} \times \text{SR}) - (\text{AH} \times \text{AR})$$

2.2 Labour rate variance = Actual time (Std. rate – Actual rate)

$$\text{LRV} = \text{AH} \times (\text{SR} - \text{AR})$$

2.3 Labour efficiency (or time) variance = Std. rate (Std. hours for actual output – Actual hours)

$$\text{LEV} = \text{SR} \times (\text{SH} - \text{AH})$$

Check:

Labour cost variance = Labour efficiency variance + Labour rate variance

$$\text{LCV} = \text{LEV} + \text{LRV}$$

2.4 Classification of Labour Efficiency Variance

Labour efficiency variance is further divided into the following variances:

(i) Idle time variance

(ii) Labour mix variance

(iii) Labour yield variance (or Labour revised-efficiency variance)

2.5 Idle time variance = Idle hours x Standard rate

ITV = IH x SR

2.6 Labour mix variance = (Revised std. hours – Actual hours) x Standard rate

LMV = (RSH – AH) x SR

2.7 Labour revised efficiency variance = (Std. hours for actual output – Revised std. hours) x Standard rate

LREV = (SH – RSH) x SR

2.8 Labour yield variance = (Actual yield – Std. yield from actual input) x Std. labour cost per unit of output

LYV = (AY – SY) x SLC

Check:

Labour efficiency variance = Idle time variance + Labour mix variance + Labour yield variance (or labour revised efficiency variance)

LEV = ITV + LMV + LYV (or LREV)

3. Overhead Variance

Basic terms used in the computation of overhead variance

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

Or

Standard overhead rate (per unit) = $\frac{\text{Budgeted Overhead}}{\text{Budgeted output in units}}$

Note: Separate overhead rates will be computed for fixed and variable overheads.

Basic calculations before the computation of overhead variances:

The following basic calculation should be made before computing variances.

(i) **When overhead rate per hour is used:**

(a) **Standard hours for actual output (SHAO)**

SHAO = $\frac{\text{Budgeted hours}}{\text{Budgeted output}} \times \text{Actual output}$

(b) **Absorbed (or Recovered) overhead** = Std. hours for actual output × Std. overhead rate per hour

(c) **Standard overhead** = Actual hours × Std. overhead rate per hour

(d) **Budgeted overhead** = Budgeted hours × Std. overhead rate per hour

(e) **Actual overhead** = Actual hours × Actual overhead rate per hour

(ii) **When overhead rate per unit is used**

(a) **Standard output for actual hours (SOAH)**

$$\text{SOAH} = \frac{\text{Budgeted output (in units)} \times \text{Actual hours}}{\text{Budgeted hours}}$$

(b) **Absorbed overhead** = Actual output × Std. overhead rate per unit

(c) **Standard overhead** = Std. output for actual time × Std. overhead rate per unit

(d) **Budgeted overhead** = Budgeted output × Std. overhead rate per unit

(e) **Actual overhead** = Actual output × Actual overhead rate per unit

Overhead cost variance = Absorbed overhead – Actual overhead

OCV = (Std. hours for actual output × Std. overhead rate) – Actual overhead

Overhead cost variance is divided into two categories:

(i) Variable overhead (VO) variances

(ii) Fixed overhead (FO) variances

3.1 Variable Overhead (VO) Variances

V. O. cost variance = (Absorbed variable overhead – Actual variable overhead)

$$= (\text{Std. hours for actual output} \times \text{Std. variable overhead Rate}) - \text{Actual overhead cost}$$

This variance is sub-divided into the following two variances:

(a) Variable overhead expenditure variance or spending variance or budget variance

(b) Variable overhead efficiency variance

3.2 V. O. expenditure variance = (Standard variable overhead – Actual variable overhead)

$$= (\text{Actual hours} \times \text{Std. variable overhead rate}) - \text{Actual overhead cost}$$

3.3 V.O. efficiency variance = (Absorbed variable overhead – Standard variable overhead)

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

Check:

V. O. cost variance = V.O. expenditure variance + V. O. efficiency variance

Fixed Overhead (FO) Variances

3.4 F.O cost variance = (Absorbed overhead – Actual overhead)

= (Std. hours for actual output × Std. fixed overhead rate) – Actual fixed overhead

Fixed overhead cost variance is further divided into the following two variances:

(a) Fixed overhead expenditure variance

(b) Fixed overhead volume variance

3.5 F.O. expenditure variance = (Budgeted fixed overhead – Actual fixed overhead)

= (Budgeted hours × Std. fixed overhead rate) – Actual fixed overhead

3.6 F.O volume variance = (Absorbed overhead – Budgeted overhead)

= (Std. hours for actual output – Budgeted hours) × Std. fixed overhead rate

Check:

F.O. cost variance = F.O. expenditure variance + F.O. volume variance

Fixed overhead volume variance is further divided into the following variances:

(a) Efficiency variance

(b) Capacity variance

(c) Calendar variance

3.7 Efficiency variance = (Absorbed fixed overhead – Standard fixed overhead)

= (Std. hours for actual output – Actual hours) × Std. fixed overhead rate

3.8 Capacity variance = (Standard fixed overhead – Budgeted overhead)

= (Actual hours – Budgeted hours) × Std. fixed overhead rate

3.9 Calendar variance = (Actual No. of working days – Std. No. of working days) × Std. fixed rate per day

Or = (Revised budgeted hours – Budgeted hours) × Std.fixed rate per hour

Where,

Revised budgeted hours = $\frac{\text{Budgeted hours}}{\text{Budgeted days}} \times \text{Actual days}$

Note: When calendar variance is computed, there will be a modification in the capacity variance. In that case revised capacity variance will be calculated and the formula is:

Revised capacity variance = (Actual hours – Revised budgeted hours) × Std. fixed rate per hour

Check: F. O. volume variance = Efficiency Variance + Capacity variance + Calendar variance

4. Sales Variance

The sales variances can be computed in two ways. They are:

- (a) Sales turnover or value method.
- (b) Profit or sales margin method.

(a) Sales turnover or sales value method: It includes the following:

4.1 Sales value variance: (Budgeted sales - Actual sales)

The variance can be bifurcated into sales price variance and sales volume variance.

4.2 Sales price variance:

Actual quantity of Sales (Actual price – Budgeted price)

or

(Actual sales - Actual quantity at budgeted prices)

4.3 Sales volume variances:

Budgeted price (Actual quantity – Budgeted quantity)

or

(Actual quantity at budgeted price - budgeted sales)

Check: Sales value variance = Sales price variance + Sales volume variances

Sales volume variance can be sub-divided into two parts:

- (i) Sales mix variance
- (ii) Sales quantity variance

4.4 Sales mix variance

Total actual sales quantity (Budgeted price per unit of actual mix – Budgeted price per unit of budgeted mix)

4.5 Sales quantity variance:

Budgeted price per unit of budgeted mix (Actual total sales qty. – Budgeted total sales qty.)

Check: Sales volume variance = Sales mix variance + Sales quantity variance

(b) Profit or sales margin method

4.6 Total Sales Margin Variance (TSMV):

(Budgeted margin - Actual margin)

4.7 Sales Margin Price Variance (SMPV):

SMPV = Actual quantity (Actual margin per unit – Budgeted margin per unit).

4.8 Sales Margin Volume Variance (SMVV):

SMVV = Budgeted margin per unit (Actual units – Budgeted units)

This can be further sub-divided into the following two variances:

4.9 Sales Margin Quantity Variance (SMQV):

(Budgeted total quantity - Actual total quantity) Budgeted margin per unit of budgeted mix.

4.10 Sales Margin Mix Variance (SMMV):

SMMV = Total actual quantity sold × (Budgeted margin per unit of actual mix - Budgeted margin per unit of budgeted mix).

Check: Sales Margin Volume Variance = Sales Margin Quantity Variance + Sales Margin Mix Variance

Question 1

(a) State the features of Partial plan of Standard Cost Accounting procedure.

(b) The following is the Operating Statement of a company for April 2001:

		Rs.	
Budgeted Profit		1,00,000	
Variances:		Favourable	Adverse
		Rs.	Rs.
Sales Volume			4,000
	Price	9,600	
Direct Material	Price		4,960
	Usage		6,400
Direct Labour	Rate		3,600
	Efficiency	3,600	
Fixed	Efficiency	2,400	

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Overheads

Capacity

4,000

Expense

1,400

17,000

22,960

5,960 (A)

Actual profit

94,040

Additional information is as under:

Budget for the year

1,20,000 units

Budgeted fixed overheads

Rs.4,80,000 per annum

Standard cost of one unit of product is:

Direct Materials

5 kg.@ Rs.4 per kg.

Direct Labour

2 hours @ Rs.3 per hour

Fixed overheads are absorbed on direct labour hour basis.

Profit

25% on sales

You are required to prepare the Annual Financial Profit / Loss Statement for April, 2001 in the following format:

Account	Qty./ Hours	Rate / Price	Actual Value Rs.
Sales			
Direct Materials			
Direct Labour			
Fixed Overheads			
Total Costs			
Profit			

Answer

(a) Features of Partial Plan of Standard Cost Accounting procedure:

Standard cost operations can be recorded in the books of account by using partial plan, Features of partial plan of standard costing procedure are as follows:

- (i) Partial plan system uses current standards in which the inventory will be valued at current standard cost figure.
- (ii) Under this method WIP account is charged at the actual cost of production for the month and is credited with the standard cost of the month's

production of finished product.

- (iii) The closing balance of WIP is also shown at standard cost. The balance after making the credit entries represent the variance from standard for the month.
- (iv) The analysis of variance is done after the end of the month.

(b) Working notes:

1. (a) Budgeted fixed overhead per unit:

$$= (\text{Budgeted fixed overheads p.a.} / \text{Budgeted output for the year})$$

$$= \text{Rs.4,80,000 p.a.} / 1,20,000 \text{ units} = \text{Rs.4 per unit.}$$
- (b) Budgeted fixed overhead hour:

$$= \text{Budgeted fixed overhead per unit} / \text{Standard labour hours per unit}$$

$$= \text{Rs.4} / 2 \text{ hours} = \text{Rs.2 per hour}$$
2. (a) Standard cost per unit:

	Rs.
Direct material	20
(5 kg × Rs.4/- per kg)	
Direct labour	6
(2 hours × Rs.3/- per hour)	
Fixed overhead	4
(2 hours × Rs.2)	
Total standard cost (per unit)	30
(b) Budgeted selling price per unit	
Standard cost per unit	30
Standard profit per unit	10
(25% on sales or 33 – 1/3% of standard cost)	
Budgeted selling price per unit	40
- 3 (a) Actual output units for April, 2001:
Fixed overhead volume Variance

$$= \text{Efficiency variance} + \text{Capacity variance}$$

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or (Budgeted output units – Actual output units) Budgeted fixed overhead p.u.

$$\text{Rs.2,400 (Favourable)} + \text{Rs.4,000 (Adverse)} = \text{Rs.1,600 (Adverse)}$$

$$\text{or } (10,000 \text{ units} - x \text{ units}) \text{ Rs.4} - \text{Rs.1,600 (Adverse)}$$

$$\text{or } (10,000 \text{ units} - 400 \text{ units}) = x \text{ (Actual output units)}$$

$$\text{or Actual output units} = 9,600 \text{ units}$$

(b) Actual fixed overhead expenses:

$$(\text{budgeted fixed overhead} - \text{Actual fixed overhead}) = \text{Fixed overhead expenses variance}$$

$$\text{or } (\text{Rs.40,000} - x) = \text{Rs.1,400 (Favourable)}$$

$$\text{or } x = \text{Rs.40,000} - \text{Rs.1,400}$$

$$= \text{Rs.38,600}$$

4. (a) Actual sales quantity units: Sales volume variance

$$= \text{Budgeted margin per unit} \left(\frac{\text{Actual sales quantity units} - \text{Budgeted quantity units}}{\text{quantity units}} \right)$$

$$= \text{Rs.4,000 (Adverse)} = \text{Rs.10} (x - 10,000 \text{ units})$$

$$\text{or } 400 \text{ units} = x - 10,000 \text{ units}$$

$$\text{or } x \text{ (Actual sales quantity)} = 9,600 \text{ units}$$

(b) Actual selling price per units

$$\text{Sales price variance} = \left(\frac{\text{Actual Selling price per unit} - \text{Budgeted selling price per unit}}{\text{price per unit}} \right) \text{Actual Sales units}$$

$$\text{or Rs.9,600 (Fav.)} = (x - \text{Rs.40}) \times 9,600 \text{ units}$$

$$\text{or Actual selling price per unit} = \text{Rs.41/-}$$

5. (a) Actual quantity of material consumed:

$$\text{Material usage variance} = \left(\frac{\text{Standard quantity} - \text{Actual quantity}}{\text{quantity}} \right) \text{Standard price per unit}$$

$$\text{or } 6,400 \text{ (Adv.)} = (9,600 \text{ units} \times 5 \text{ kgs.}) \text{ Rs.4}$$

$$\text{or } x \text{ kgs.} = 49,600 \text{ kgs.}$$

(actual quantity of material consumed)

(b) Actual price per kg:

Actual price per kg.:

Material price variance = (Standard price per kg – Actual price per kg)
Actual quantity of material consumed

-Rs.4,960 = (Rs.4 –Rs. y per kg.) 49,600 kg.

-0.1 = (Rs.4 – Rs. y per kg)

or y = Rs.4.10 per kg.

6. (a) Actual direct labour hour used:

Labour efficiency variance = (Standard hours – Actual hours)
Standard rate per hour

Rs.3,600 (Favourable) = (9,600 units × 2 hours – p hours) Rs.3

Rs.3,600 (Favourable) = (19,200 hours – p hours) Rs.3

P hours = (19,200 hours – 1,200 hours) – 18,000
hours (Actual direct labour hours)

(b) Actual direct labour hour rate:

Labour rate variance = $\left(\begin{array}{c} \text{Standard} \\ \text{rate per hour} \end{array} - \begin{array}{c} \text{Actual rate} \\ \text{per hour} \end{array} \right) \text{Actual Direct labour hours}$

Rs.3,600 (Adverse) = (Rs.3 per hour – t per hour) 18,000 hours

or t = Rs.3 + Rs.0.20 – Rs.3.20 per hour
(actual direct labour hour rate)

7. Actual fixed overheads:

Fixed overhead expense variance = Budgeted fixed overhead – Actual fixed overhead

or Rs.1,400 (Favourable) = 10,000 units×Rs.4 p.u.–Actual fixed overhead

or Actual fixed overhead = Rs.40,000 – Rs.1,400

or Actual fixed overhead = Rs.38,600

Annual financial Profit /Loss Statement
(for April, 2001)

<i>Account</i>	<i>Qty./ Hours</i>	<i>Rate/Price</i>	<i>Actual/ Value</i>
<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)=(b)×(c)</i>
Sales: (A)	9,600 units	41	3,93,600
(Refer to working note 4)			
Direct Materials	49,600 kgs.	4.10 per kg.	2,03,360
(Refer to working note 5)			
Direct labour	18,000 hours	3,20 per hour	57,600
(Refer to working note 6)			
Fixed Overheads	18,000 hours	2.14444 per hour	38,600
(Refer to working note 6 (a) and 7)			
(Rs.38,600/18,000 hours)			
(absorbed on direct labour hour basis)			
Total costs: (B)			2,99,560
Profit: [(A) – (B)]			94,040

Question 2

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

<i>Fruits extract</i>	<i>400 kgs @ Rs. 16 per kg.</i>
<i>Glucose syrup</i>	<i>700 kgs @ Rs. 10 per kg.</i>
<i>Pectin</i>	<i>99 kgs. @ 33.2 per kg.</i>
<i>Citric acid</i>	<i>1 kg at Rs. 200 per kg.</i>
<i>Labour</i>	<i>18 hours @ Rs. 32.50 per hour.</i>
<i>Standard processing loss 3%.</i>	

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The climate conditions proved disastrous for the raspberry crop. As a consequence, normal prices in the trade were Rs. 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 Rs. 18 per kg.
Glucose syrup	742 kgs at Rs. 12 per kg.
Pectin	125 kgs at Rs 32.8 per kg.
Citric acid	1 kg at Rs. 95 per kg.
Labour	20 hrs. at Rs. 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.

Answer

Details of original and revised standards and actual achieved

	Original standards		Revised standards		Actual	
Fruit	400 Kgs × Rs16	Rs6,400	400 Kgs × 19	Rs7,600	428 Kgs × 18	Rs7,704
Glucose	700 Kgs × Rs10	Rs7,000	700 Kgs × Rs12	Rs 8,400	742 Kgs × Rs 12	Rs 8,904
Pectin	99 Kgs × Rs 33.2	Rs 3286.8	99 Kgs × Rs 33.2	Rs 3286.8	125Kgs×Rs 32.8	Rs 4,100
Citric acid	1 Kg× Rs 200	Rs 200	1 Kg× Rs 200	Rs 200	1 Kg× Rs 95	Rs 95
	1,200 kgs	Rs16,886.8	1,200 kgs	Rs19,486.8	1,296 kgs	Rs20,803
Labour		Rs 585.0		Rs 585.0		Rs 600
	1,200 kgs	17,471.8	1,200 kgs	20,071.8	1,296 kgs	21,403

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Loss	36 kgs		36kgs		132	
	1,164kgs	Rs	1,164kgs	Rs	1,164 Kgs	Rs
		17,471.8		20,071.8		21,403

(i) Planning variances

* Fruit extract (6,400 less 7,600)	Rs 1,200(Adverse)
Glucose syrup (7,000 less 8,400)	Rs1,400(Adverse)
Total	Rs 2,600(Adverse)
* (Std qty × Std price less Std qty × Revised Std price)	

(ii) Ingredients operating variances

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

Ingredients Price variance

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

		Variance in Rs
Fruit extract	$(19 - 18) \times 428$	428(F)
Glucose syrup		Nil
Pectin	$(33.2 - 32.8) \times 125$	50(F)
Citric acid	$(200 - 95) \times 1$	105(F)
		583(F)

Usage variance

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

	Rs	Variance in Rs
Fruit extract	$(400 - 428) \times 19$	532(A)
Glucose syrup	$(700 - 742) \times 12$	504(A)
Pectin	$(99 - 125) \times 33.2$	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

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		Variance in Rs
Fruit extract	$(432 - 428) \times 19$	76(F)
Glucose syrup	$(756 - 742) \times 12$	168 (F)
Pectin	$(106.92 - 125) \times 33.2$	600.3(A)
Citric acid	$(1.08 - 1) \times 200$	16(F)
		340.3 (A)

Yield variance

(Actual yield – Std yield from actual output) $\times$ 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.

$$\text{Or Total Variance} = (2,600) + (1,899.2) + 583 + (15) = 3931.2 (A).$$

Question 3

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.
	<i>Raw Material -1</i>	
Beg. Balance	0	18,000
	Closing Balance	6,000
	<i>Raw Material -2</i>	
Beg. Balance	18,000	
	Closing Balance	41,400
	<i>Work in Progress</i>	
Beg. Balance	0	
Raw Material -2	72,000	Closing Balance 0

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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 Rs180 per litre and standard quantity is 5 litres. Standard wages rate is Rs24 per hour and a total 2,300 hours were worked during the week. 1,000 kg of Material -1 and 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.

Answer

Material – 1 Rate Variance	= Standard cost of material purchased – Actual cost = Rs24, 000 – Rs21, 600 = Rs2, 400 (F)
Material – 2 Quantity Variance	= SR × SQ – SR × AQ = Rs900 × 80 units – Rs75, 600 = Rs3, 600 (A)
Labour Spending Variance	= SR × AH – AR × AH = Rs24/per hour × 2300 hours – Rs51, 750 = Rs3, 450 (A)
Labour Efficiency Variance	= SR × (SH – AH) – 7200 = 24 (SH – 2300) SH = 2000 Hrs.

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	Rs
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 = Rs72, 000 (Given)
Standard cost of Material – 2 per unit: 5 litres × Rs180 = Rs900
∴ No of units produced = Rs72, 000 / Rs900 = 80 units
Total material – 1 used in production = Rs18, 000 (Given)
Add Closing Inventory = Rs6, 000 (Given)
Less Opening Inventory = 0
Hence Standard Cost of Material – 1 purchased = Rs24, 000
- (2) Standard Rate of Material -1 = Rs24, 000 / 1,000kg
= Rs24 per kg
Standard Cost of Material – 1 = Rs18, 000
Add favourable Quantity Variance = Rs1, 200
Material – 1 allowed = Rs19, 200
Standard quantity of Material – 1 allowed = Rs19, 200/Rs24= 800 Kg.
Standard quantity per unit = 800kg/80units = 10 kg
Standard purchase price for Material – 2 = (550liters × Rs180)= Rs99, 000
Add unfavourable Rate Variance = Rs6, 600
Actual cost Price of Material – 2 = Rs1, 05, 600
- (3) Opening balance of Material – 2 = Rs18, 000
Add Standard Cost of Purchase (550 litres × Rs180) = Rs99, 000
Less Closing Balance = Rs41, 400
Material-2 Consumed at Standard cost = Rs75, 600

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Question 4

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

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 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 Rs. 17,000, detailed below:

	Rs.
Sales	4,99,200
Closing stock (at prime cost)	<u>18,000</u>
	5,17,200
Costs:	
Direct material	1,68,000
Direct labour	1,05,000
Variable overhead	<u>42,000</u>
	3,15,000
Fixed overhead	1,20,000
Fixed Admn. Overhead	40,000
Variable distribution Overhead	19,200
Fixed selling Overhead	<u>40,000</u>
	<u>2,19,200</u>

Standard Costing

Total costs	<u>5,34,000</u>
Loss	<u>17,000</u>

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.

Answer

(i)

	Details	Working	Amount (Rs.)
(1)	Selling price at cost	<u>4,99,200</u>	416
		1,200	
(2)	Raw materials	<u>1,48,000</u>	120
		1,400	
	Labour	<u>1,05,000</u>	60
		1,750	
	[Equivalent units (1,400/80%)]		
	Factory overhead	<u>42,000</u>	
		1,400	30
	Total manufacturing cost		210
	Distribution overheads	<u>19,200</u>	16
		1,200	
	Total cost		226
	Contribution		190
	Total fixed cost: factory	1,20,000	
	Administration	40,000	
	Selling	40,000	2,00,000

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

	Rs.	
Contribution	$1,200 \times 190$	2,28,000
Less: Fixed costs		<u>2,00,000</u>
Profit		<u>28,000</u>

(iii) Reconciliation

	Rs.	
Budgeted profit	$(2,000 \times 190 - 2,00,000)$	1,80,000
Less: Volume variance	800×190	1,62,000
Standard profit		28,000
<i>Factors causing loss:</i>		
Units scrapped	100×210	21,000
Labour inefficiency	350×60	21,000
Undervaluation of closing stock	$100 \times (210 - 180)$	3,000
Actual profit		<u>-17,000</u>

Question 6

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

	Rs.	
Budgeted profit		15,000
<i>Less: Adverse variances:</i>		
Contribution price variance	10,600	
Direct materials variance	1,000	
Fixed overhead variance	<u>600</u>	<u>(12,200)</u>
		2,800
<i>Add: Favourable variances</i>		
Contribution quantity variance	1,800	

Standard Costing

Direct wages variance	600	
Variable overhead variance	<u>1,800</u>	<u>4,200</u>
Actual profit		<u>7,000</u>

There is no inventory

Production units = Sales units for both actual and budget.

Standard selling price Rs. 18/unit

Standard variable cost Rs. 15/unit

Standard contribution Rs. 3/unit

Actual selling price Rs. 17/unit

Budgeted sales 10,000 units

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

Material usage variance = 400 (Adv.)

Actual labour hours @ actual rate = Rs. 63,000

Actual labour hours @ standard rate = Rs. 61,950

Variable overhead standard rate = Rs. 2

Standard hours of production = 4 per unit

Variable overhead at standard rate = Rs. 84,800.

Variable overhead expenditure variance = 400 (A).

Budgeted fixed overhead = Rs. 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.

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Answer

		Rs.
(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 $10,600 \times 17$	1,80,200
(3)	Actual quantity of Raw Materials used	
	Standard consumption $10,600 \times 5$	2,000 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	
	Selling Overhead variance – Variable overhead	Rs. 84,800 – Rs. 1,800 = Rs. 83,000
(6)	Variable Overhead efficiency variance	
	Actual hours (AH)	$61950/15$ 41,300 hours
	Standard hours (SH)	$60,600 \times 4$ 42,400 hours
	Standard rate per hour (SR)	$63600/(10600 \times 4)$ Rs. 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 = Rs. 15,600.	
(8)	Operating profit variance	
	If budgeted profit is considered $(15,000 - 7,000) = Rs. 8,000$ adverse	
	If standard profit is considered $(16,800 - 7,000) = Rs. 9,800$ adverse	

Question 7

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.*

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 8

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 (Rs./kg.)	24	30	
Actual input (kg.)	<u>?</u>	70	
Actual output (kg.)			<u>?</u>

Advanced Management Accounting

Actual price Rs./kg.	30	<u>?</u>	
Standard input quantity (kg.)	<u>?</u>	<u>?</u>	
Yield variance (sub usage)	<u>?</u>	<u>?</u>	270(A)
Mix variance	<u>?</u>	<u>?</u>	<u>?</u>
Usage variance	<u>?</u>	<u>?</u>	<u>?</u>
Price variance	<u>?</u>	<u>?</u>	<u>?</u>
Cost variance	0	<u>?</u>	1300(A)

Answer

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

DM yield variance for 'A' =

$$\text{DM yield variance for 'A'} = \left[\frac{\text{Std qty of all DM allowed for actual output}}{\text{Actual total qty of all DM used}} \times \text{Std Mix \%age of 'A'} \times \text{Std price of 'A'} \right]$$

$$= [SQ_A - RSQ_A] \times \text{Std price of 'A'}$$

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

$$\text{DM yield variance for 'B'} = \left[\frac{\text{Std qty of all DM allowed for actual output}}{\text{Actual total qty of all DM used}} \times \text{Std Mix \%age of 'B'} \times \text{Std price of 'B'} \right]$$

$$= [SQ_B - RSQ_B] \times \text{Std price of 'B'}$$

Where RSQ_B = Revised Standard Quantity of 'B' = (Actual total qty of all DM used) $\times$ 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 $\times$ 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' = $T \times (\text{Std price of 'A'} + \text{Std price of 'B'})$

Where $T = (\text{Std qty of all DM allowed for actual output} - \text{Actual total qty of all DM used}) \times 0.5$

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

$$- \text{Rs } 270 = T \times \text{Rs } 24 + T \times \text{Rs } 30$$

$$\text{Or } T = -5$$

Hence Yield Variance for 'A' = $-5 \times 24 = -\text{Rs } 120$ and

Yield variance for 'B' = $-5 \times 30 = -\text{Rs } 150$.

Also

$$(\text{SQ}_A - \text{RSQ}_A) \times 24 = -120 \text{ or } \text{SQ}_A - \text{RSQ}_A = -5$$

Similarly

$$(\text{SQ}_B - \text{RSQ}_B) \times 30 = -150 \text{ or } \text{SQ}_B - \text{RSQ}_B = -5$$

Alternative 1

Let total actual quantity consumed; X kg.

Then, Quantity of A = $X - 70$

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

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,

$$(\text{SP}_A \times \text{SQ}_A) - (\text{AQ}_A \times \text{AP}_A) = 0$$

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

$$\text{or } X = 110 \text{ Kgs}$$

Therefore Actual Input for 'A' = $110 - 70 = 40 \text{ Kgs}$

Also, Standard Input for 'A' and 'B' will be $\left(\frac{110}{2} - 5\right) = 50 \text{ Kgs}$. Using this quantity in the

Cost Variance of 'B', the actual price per kg of 'B' (AP_B) will be ,

$$50 \times 30 - 70 \times \text{AP}_B = -1,300$$

$$\text{Or } \text{AP}_B = \text{Rs } 40.$$

Alternative 2

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

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Actual input = $(2X + 10)$ Kgs. $\therefore$ Actual input for 'A' = $(2X + 10 - 70) = (2X - 60)$ Kgs

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

$$\text{Rs. } 24 \times X - \text{Rs. } 30 \times (2X - 60) = 0$$

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 $AP_B = \text{Rs. } 40$.

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,

$$24 \times (0.5X + 30) - 30 \times X = 0$$

Or $X = 40$ Kgs.

$\therefore$ 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,

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

Or $AP_B = \text{Rs. } 40$.

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

	(1)	(2)	(3)	(4)	
	Std. Price $\times$ SQ	Std. Price $\times$ RSQ	Std. Price $\times$ Actual Qty.	Actual Price $\times$ Actual Qty.	
A	$24 \times 50 = 1200$	$24 \times 55 = 1320$	$24 \times 40 = 960$	$30 \times 40 = 1200$	
B	$30 \times 50 = 1500$	$30 \times 55 = 1650$	$30 \times 70 = 2100$	$40 \times 70 = 2800$	
	<u>2700</u>	<u>2970</u>	<u>3060</u>	<u>4000</u>	
	(1) – (2)	(2) – (3)	(1) – (3)	(3) – (4)	(1) – (4)
	Yld variance	Mix variance	Usage variance	Price variance	Cost variance
A	$1200 - 1320 = 120(A)$	$1320 - 960 = 360(F)$	$1200 - 960 = 240(F)$	$960 - 1200 = 240(A)$	$1200 - 1200 = 0$

Standard Costing

B	$1500 - 1650 =$	$1650 - 2100 =$	$1500 - 2100 =$	$2100 - 2800$	$1500 - 2800$
	150(A)	450(A)	600(A)	= 700(A)	= 1300(A)
	<u>270A)</u>	<u>90A)</u>	<u>360A)</u>	<u>940A)</u>	<u>1300A)</u>

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 9

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

	Amount (Rs. 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	<u>80</u>	<u>150</u>
Total (B)	<u>560</u>	<u>680</u>
Profit (A – B)	<u>40</u>	<u>90</u>

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 of 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.

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- (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.

Answer

Working Notes:

- (i) Budgeted sales in year 2006 = $(100/110) \times 770$ = Rs. 700 lakhs
(ii) Budgeted direct material cost = $(300/600) \times 700$ = Rs. 350 lakhs
(iii) Budgeted direct wages and variable overheads = $(180/600) \times 700$ = Rs. 210 lakhs
(iv) Rate per M. ton of direct material: Year 2005 = $(300/5)$ = Rs. 60
: Year 2006 = $(324/5.40)$ = Rs. 60
(v) Material usage budget for the year 2006 = $(5/600) \times 700$ = 5.83333 lakhs
(vi) Direct labour hours budget for the year 2006 = $(75/600) \times 700$ = 87.50 lakhs
(vii) Direct labour and variable overheads rate per hour: Year 2005 = $(180/75)$ = Rs. 2.40
Year 2006 = $(206/80)$ = Rs. 2.575
(viii) Material price variance = $(\text{Rs. } 60 - \text{Rs. } 60) \times 5,40,000$ = zero
(ix) Material usage variance = $(5.83333 - 5.40) \times \text{Rs. } 60$ = Rs. 26 lakhs (F)
(x) Labour and variable overheads rate variance = $(2.40 - 2.575) \times 80$ = Rs.14 lakhs (A)
(xi) Labour and variable overheads efficiency variance = $(87.50 - 80.00) \times \text{Rs. } 2.40$
= Rs. 18 lakhs (F)
(xii) Fixed overheads expenditure variance = $(150 - 80)$ = Rs. 70 lakhs (A)

(xiii) **Statement of working results of the company**

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

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

	<i>Favourable</i>	<i>Adverse</i>
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	<u>–</u>	<u>70</u>
	<u>134</u>	<u>84</u>
Total change in profit (increase)	<u>50</u>	

II Break-even point

Year 2005: $(80/120) \times 600 = \text{Rs. } 400 \text{ lakhs}$

Year 2006: $(150/240) \times 770 = \text{Rs. } 481.25 \text{ lakhs}$

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 = Rs. 150 lakhs.

Required contribution at total sales = $\text{Rs. } 150 / 0.55 = \text{Rs. } 272.73 \text{ lakhs}$

Additional contribution required = $(272.73 - 240) = \text{Rs. } 32.73 \text{ lakhs}$

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

Question 10

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 Rs.22 per hour, of which 5,000 hours, being idle time, were not recorded in production

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Standard hours	=	10 hours per unit
Labour efficiency variance	=	Rs. 3,75,000 (A)
Standard variable Overhead	=	Rs. 150 per unit
Actual variable Overhead	=	Rs. 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.

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 $\times$ 9,000 units = 90,000 hours.

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

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

SR (90,000 – 1,05,000) = – 3,75,000

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

(i) Idle time variance = 5,000 hours $\times$ 25 Rs. / hour = 1,25,000. (A)

(ii) Standard Variable Overhead = Rs. 150 / unit

Standard hours = 10 hours / unit

Standard Variable Overhead rate / hour = 150 / 10 = Rs. 15 / hour

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

= Standard Rate $\times$ Standard hours – Actual
rate $\times$ Actual hours

= (15) $\times$ (10 $\times$ 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)
 $= (15 \times 1,05,000) - 16,00,000$
 $= 15,75,000 - 16,00,000$
 $= 25,000 \text{ (A)}$
- (iv) Variable Overhead Efficiency Variance = Standard Rate × (Standard Hours for
actual output – Actual hours for Actual
output)
 $= 15 (90,000 - 1,05,000)$
 $= 15 (-15,000)$
 $= 2,25,000 \text{ (A)}$

Alternative Solution

Actual Output = 9,000 Units

Idle time = 5,000 hrs

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

Standard hours = 10 per unit.

Labour efficiency variance = Rs. 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 = Rs 25/-

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

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

- (ii) Standard Variable Overhead / unit = 150

Standard Rate = $\frac{150}{10} = \text{Rs. } 15/\text{hour}$

Standard Quantity = 10 hours

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Actual Variable Overhead = 16,00,000

Standard Variable Overhead = $150 \times 9,000$ = 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

= $(150 \times 1,05,000) - 16,00,000$

= 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)

= $15 (10 \text{ hours} \times 90,000 \text{ units} - 1,05,000)$

= $15 (90,000 - 1,05,000)$

= $15 (-15,000)$

= 2,25,000 (A)

Question 11

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

		Rs.
Sales		4,45,500
Costs:		
Direct Materials	59,400	
Direct Wages	89,400	
Variable Overheads	1,45,500	
Fixed Overheads	<u>78,000</u>	<u>3,72,300</u>
Profit		<u>73,200</u>

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

Standard Costing

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

		Rs.
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.

Answer

Direct Materials:

SQ	AQ	SP	SQ × SP	AQ × SP	AP	AQ × AP
						59,400
			Usage variance	Price variance		
			1200 A	600 A		

$$AQ \times SP = 58,800^1$$

$$SQ \times SP = 57,600^2$$

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

Hence, standard cost per unit is $57,600 / 9,600 = \text{Rs. } 6$.

Direct Labour:

SH	AH	SR	SH × SR	AH × SR	AR	AH × AR
						89,400
			Efficiency variance	Rate variance		
			4500 A	1500 F		

$$SH \times SR = 86,400^4$$

Standard wage rate is Rs. 4.50.

Variable Overheads:

Standard cost per unit is 2 hours $\times$ Rs. 7.50 = Rs. 15.

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

SQ	AQ	SP	SQ × SP	AQ × SP	AP	AQ × AP	
							4,45,500
						Price variance	13,500 F

Actual units = 9,600

Standard Costing

Original Budget and Standard Cost Sheet:

	<i>Budget</i>	<i>Standard Cost</i>
Units budgeted	10,000	
Sales	<u>4,50,000</u>	<u>45.00</u>
Direct materials @ Rs. 6 per unit	60,000	6.00
Direct Wages	90,000	9.00
Variable Overheads @ Rs. 15 per unit	1,50,000	15.00
Fixed overheads @ Rs. 7.50 per unit	<u>75,000</u>	<u>7.50</u>
Total costs	<u>3,75,000</u>	<u>37.50</u>
Profit	<u>75,000</u>	<u>7.50</u>

Sales volume variance is $(9,600 - 10,000) \times 7.50 = \text{Rs. } 3,000 \text{ A}$

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	<u> </u>	<u>3,000</u>	
Total variances		<u>7,500</u>	<u>19,800</u>	12,300 A
Actual profit				73,200

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Working Notes:

- (1) Price Variance = $[SP - AP] AQ$
600 (A) = $[SP \times AQ - 59,400]$
 $SP \times AQ = 58,800$.
- (2) Usage Variance = $[SQ \times SP] - [AQ \times SP]$
1200 (A) = $SQ \times SP - 58,800$
 $SQ \times SP = 57,600$.
- (3) Rate Variance = $[SR - AR] AH$
1500 (F) = $SR \times AH - 89,400$
 $SR \times AH = 90,900$.
- (4) Efficiency Variance = $[SH - AH] \times SR$
4500 (A) = $SH \times SR - 90,900$
 $SH \times SR = 86,400$.
- (5) Price Variance = $(AP - SP) \times AQ$
13500 (F) = $SP \times AQ - 4,45,500$
 $SP \times AQ = 4,59,000$.

Question 12

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

	Rs.	
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)

Standard Costing

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 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 @ Rs. 2.00	8.00
Labour 4 hours @ Rs. 32.00	128.00
Variable overhead	
4 hours @ Rs. 12.00	48.00
Fixed overheads	
4 hours @ Rs. 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 Rs. 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.

Answer

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

Advanced Management Accounting

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

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

(ii) Actual production = 8,250 units

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

Less: Difference in material use

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

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

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

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

(iii) Actual hours

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

Difference in actual and standard

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

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

(iv) Actual variable overhead incurred:

$$\text{Standard cost of variable overhead} = 8,250 \times 48 = \text{Rs. } 3,96,000$$

$$\text{Total variable overhead cost variance [8,000 (F) + 12,000 (A)]} = \underline{\text{Rs. } 4,000 \text{ (A)}}$$

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

(v) Actual fixed overhead:

Budgeted fixed overhead =

$$\text{Budgeted units} \times \text{Budgeted rate}$$

$$= 10,000 \times 112 = \text{Rs. } 11,20,000$$

Standard Costing

Expenditure variance	= Rs. 4,000 (F)
Actual fixed overhead	= <u>Rs. 11,16,000</u>

It can also be calculated as below:

Actual fixed overhead:

Standard fixed overhead = (Actual output × Standard fixed overhead rate per unit) $8,250 \times 112$ = Rs. 9,24,000

Total fixed overhead variance [1,96,000 (A) + 4,000 (F)] = Rs. 1,92,000 (A)

Actual fixed overhead = Rs. 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) = $(4 \times 8,250 \times 12)$ – Actual variable overhead

Actual variable overhead = Rs. 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) = $(4 \times 8,250 \times 28)$ – Actual fixed overheads.

Actual fixed overhead = Rs. 11,16,000.

Question 13

The CEO of your company has been given the following statement showing the results for a recent month:

Particulars	Master Budget	Actual
Units produced & sold	10,000	9,000
	Rs.	Rs.
Sales	8,00,000	7,00,000

Advanced Management Accounting

Direct material	2,00,000	1,84,000
Direct Wages	3,00,000	2,62,000
Variable overhead	1,00,000	94,000
Fixed overhead	1,00,000	98,000
Total Cost	7,00,000	6,38,000
Net Surplus	1,00,000	62,000

The standard cost of the product is as follows:

Direct material (1 kg @ Rs. 20/kg) Rs. 20.00 per unit

Direct Wages (1 hour @ Rs. 30/hour) Rs. 30.00 per unit

Variable overhead (1 hour @ Rs. 10/hour) Rs. 10.00 per unit

Actual results for the month revealed that 9,800 kg. of material was used and 8,800 labour hours were recorded.

- Prepare a flexible budget for the month and compare with the actual results.
- Calculate material volume and variable overhead efficiency variances.

Answer

(i)

Particular	Master Budget		Flexible Budget	Actual	Variance	
Units	10,000		9,000	9,000		
	(Rs.) Total	(Rs.) Per Unit	(Rs.)	(Rs.)		
Sales	8,00,000	80	7,20,000	7,00,000	20,000	(A)
Direct Material	2,00,000	20	1,80,000	1,84,000	4,000	(A)
Direct Wages	3,00,000	30	2,70,000	2,62,000	8,000	(F)
Variable Overhead	1,00,000	10	90,000	94,000	4,000	(A)
Total Variable Cost	6,00,000	60	5,40,000	5,40,000	-	
Contribution	2,00,000	20	1,80,000	1,60,000	20,000	(A)
Fixed Overhead	1,00,000	10	1,00,000	98,000	2,000	(F)
Net Profit	1,00,000	10	80,000	62,000	18,000	(A)

(ii) **Calculation of Variances:**

Material Volume Variance: $SP (SQ - AQ) = 20 (9,000 - 9,800) = 16,000 (A)$

Variable Overhead efficiency variance $SR (SH - AR) = 10 (9,000 - 8,800) = 2,000 (F)$

Question 14

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 (Rs.)	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 Rs.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

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				Rate Variance		
	350 (A)					120 (F)				40 (A)		
	Cost Variance = 270 (A)											

Advanced Management Accounting

Workings Note:

Standard hours produced = 270

Standard Mix: $270 \div 9 = 30$

	<i>Skill</i>	<i>Semi-Skill</i>	<i>Unskilled</i>
Ratio	4:	3:	2:
Hrs.	120	90	60

Actual hrs = $40 \times 9 = 360$ 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			
∴	$\frac{120}{40} = 3$	$\frac{160}{40} = 4$	$\frac{80}{40} = 2$
No. of Workers			
(i)	3	4	2

- (ii) Gang Variance:

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

$$= 1400 - 1280 = 120 \text{ (F)}$$
- (iii) Sub-efficiency Variance:

$$= \text{Standard Rate} (\text{Standard Hrs} - \text{Actual Hrs in Standard Ratio})$$

$$= 1050 - 1400 = 350 \text{ (A)}$$
- (iv) Total Labour Rate Variance:

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

$$= 1280 - 1320 = 40 \text{ (A)}$$
- (v) Labour Cost Variance:

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

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

Question 15

Global Limited uses standard and marginal costing system. It provides the following details for the year 2007-08 relating to its production, cost and sales:

Particulars	Budget	Actual
Sales units	24,000	25,600
Sales value	6,000	6,784
Materials	960	1,080
Labour	1,440	1,664
Variable overheads	2,400	2,592
Total variable cost	4,800	5,336

The sales budget is based on the expectation of the company's estimate of market share of 12%. The entire industry's sales of the same product for the year 2007-08 is 2,40,000 units. Further details are as follows:

(In Rs.)

Particulars	Standard	Actual
Material price per kg.	8.00	7.50
Labour rate per hour	6.00	6.40

Advanced Management Accounting

You are required to:

- (a) Prepare a statement reconciling the budgeted contribution with actual contribution on the basis of important material variances, labour variances, variable overhead variances and sales variances.
- (b) Compute market size variance and market share variance.

Answer

Sales variances

Budgeted Sales Rs.6000

Budgeted sales quantity 24000

Budgeted selling price $6000/24000 = \text{Rs.}0.25$

Actual industry sales in units 240000

Budgeted market share 12%

Hence market share required: $240000 \times 12\% = 28800$ units

SQ	RSQ	AQ	SP	SQ × SP	RSQ × SP	AQ × SP	AQ×AP
24000	28800	25600	0.25	6000	7200	6400	6784

Sales Market Size variance $6000-7200 = \text{Rs.}1200$ F

Sales Market Share Variance: $7200-6400 = \text{Rs. } 800$ A

Sales Volume Variance: $6000-6400 = \text{Rs. } 400$ F

Sales Price variance $6400-6784 = \text{Rs. } 384$ F

Budgeted contribution:

Sales Rs.6000

Variable costs Rs.4800

Contribution Rs.1200

Units 24000

Contribution/unit: Rs.0.05

$(1200/24000)$

SQ	RSQ	AQ	SP	SQ × SP	RSQ × SP	AQ × SP
24000	28800	25600	0.05	1200	1440	1280

Standard Costing

Sales Market Size variance: $1200 - 1440 = \text{Rs.}240 \text{ F}$

Sales Market Share Variance: $1440 - 1280 = \text{Rs.}160 \text{ A}$

Sales Volume Variance $1200 - 1280 = \text{Rs } 80 \text{ F}$

As per the requirement of the question (b)

Sales Market Size variance is Rs.1200 F

Sales Market Share variance is Rs.800 A

Sales Variances:

Sales Gross Margin Market Size variance Rs.240 F

Sales Gross Margin Market Share variance Rs.160 A

Sales Gross Margin Volume Variance: Rs. 80 F

Sales Price Variance Rs.384 F

Direct materials:

Budgeted Material costs Rs.960

Budgeted units 24000

Budgeted material cost per 100 units: = Rs.4.00

$(960/24000) \times 100$

Standard price of Material/ kg = Rs.8

Standard requirement of materials per 100 units of output: $4/8 = 0.50 \text{ kg}$

Actual output: = 25600

Standard requirement for actual output =128kg

$(25600 \times 0.50)/100$

Actual material cost: = Rs.1080

Actual price/kg = Rs.7.50

Actual quantity of materials consumed: = 144 kg

$(1080/7.50)$

SQ	AQ	SP	SQ × SP	AQ × SP	AP	AQ x AP
128	144	8	1024	1152	7.50	1080

Usage Variance $1024-1152 = \text{Rs.}128 \text{ A}$

Price Variance $1152-1080 = \text{Rs. } 72 \text{ F}$

Advanced Management Accounting

Direct Labour:

Budgeted Labour costs Rs.1440
 Budgeted units 24000
 Budgeted Labour cost per 100 units: = Rs.6.00
 $(1440/24000) \times 100$

Standard Labour hour rate/hour = Rs.6

Standard requirement of labour hours per 100 units of output: $6/6 = 1.00$ hour

Actual output = 25600

Standard hours required for actual output: $(25600 \times 1)/100 = 256$ hours

Actual labour cost: = Rs.1664

Actual direct labour hour rate = Rs.6.40

Actual hours worked $(1664/6.40) = 260$ hours

Budgeted direct labour $(1440/6) = 240$ hours

SH	AH	SR	SH×SR	AH×SR	AR	AH×AR
256	260	6	1536	1560	6.40	1664

Efficiency Variance $1536 - 1560 = \text{Rs. } 24 \text{ A}$

Labour Rate Variance $1560 - 1664 = \text{Rs. } 104 \text{ A}$

Variable Overheads:

Budgeted variable overheads Rs. 2400

Budgeted direct labour hours 240

Budgeted variable overhead rate per direct labour hour: $2400/240 = \text{Rs. } 10$

A. Charged to production: $256 \text{ hours} \times 10$ Rs.2560

B. Standard cost of actual hours: 260×10 Rs.2600

C. Actual overheads Rs.2592

Efficiency Variance $2560 - 2600$ Rs. 40 A

Expense variance $2600 - 2592$ Rs. 8 F

Contribution analysis:

Budget	Actual
Rs.	Rs

Standard Costing

Sales	6000	6784
Variable costs	4800	5336
Contribution	1200	1448

Statement of Reconciliation between Budgeted and Actual Contribution

			Rs
Budgeted Contribution			1200
Gross Margin Sales Volume Variance			80 F
Standard Contribution			1280
Sales Price Variance			384 F
Total contribution			1664
Cost Variances:			
	F	A	
Material Usage Variance		128	
Material Price Variance	72		
Labour Efficiency Variance		24	
Labour Rate Variance		104	
Variable OH Efficiency Variance		40	
Variable OH Expense Variance	<u>8</u>	<u>—</u>	<u>216 A</u>
Actual Contribution			<u>1448</u>

Question 16

The following information relates to a manufacturing concern:

Standard	Rs.
Material A 24,000 kgs @ Rs.3 per kg.	72,000
Material B 12,000 kgs @ Rs.4 per kg	48,000
Wages 60,000 hours @ Rs.4 per hour	2,40,000
Variable overheads 60,000 hours @ Re.1 per hour	60,000
Fixed overheads 60,000 hours @ Rs.2 per hour	1,20,000
Total Cost	5,40,000
Budgeted profit	60,000

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<i>Budgeted sales</i>	6,00,000
<i>Budgeted production (units)</i>	12,000
<i>Actual</i>	<i>Rs.</i>
<i>Sales (9,000 units)</i>	4,57,500
<i>Material A consumed 22,275 kgs.</i>	62,370
<i>Material B consumed 10,890 kgs.</i>	44,649
<i>Wages paid (48,000 hours)</i>	1,91,250
<i>Fixed Overhead</i>	1,20,900
<i>Variable overhead</i>	45,000
<i>Labour hours worked</i>	47,700
<i>Closing work in progress</i>	900 units
<i>Degree of completion:</i>	
<i>Material A and B</i>	100%
<i>Wage and overheads</i>	50%

You are required to:

- Calculate all the material and labour variances.
- Calculate variable overhead expenditure and efficiency variances, fixed overhead expenditure and volume variances and sales price and sales volume variances.

Answer

(i) Statement of Equivalent Production in Units

<i>Particulars</i>	<i>Materials</i>		<i>Wages & Overheads</i>	
	<i>% age</i>	<i>Units</i>	<i>% age</i>	<i>Units</i>
Units Completed	100%	9000	100%	9000
Closing W.I.P.	100%	900	50%	450
Equivalent Units		9900		9450

Material Variances

<i>Standard qty for actual output ** x std price</i>			<i>Actual qty X actual price</i>	
Material A	19,800 @ 3	= 59,400	22,275@2.8*	= 62,370

Standard Costing

Material B	9,900 @ 4	= 39,600	10,889 @4.1*	= 44,649
	29,700	99,000	33,165	1,07,019

*Actual Cost / Actual Quantity

** Standard Quantity for actual output = (std qty/ budgeted prod) x actual output

MCV = TSC – TAC

= 99,000 – 1,07,019 = 8,019 (A)

MPV = AQ (SP – AP)

A = 22,275 (3 – 2.80) = 4,455 (F)

B = 10,890 (4 – 4.10) = 1,089 (A)

3,366 (F)

MUV = SP (SQ – AQ)

A = 3 (19,800 – 22,275) = 7,425 (A)

B = 4 (9,900 – 10,890) = 3,960 (A)

11,385 (A)

MMV = SP (RSQ – AQ)

A = 3 {19,800 ÷ 29,700 × 33,165 – 22,275} = 495 (A)

B = 4 {9,900 ÷ 29,700 × 3,165 – 10,890} = 660 (F)

165 (F)

MYV = S. C Per Unit (S. O. For Actual Mix – A. O.)

= 99,000 ÷ 9,900 {9,900 ÷ 29,700 × 33,165 – 9,900}

= 10 (11.055 – 9,900) = 11,550 (A)

Labour Variances:

LCV = TSC – TAC

= 2,40,000 ÷ 12,000 × 9,450 – 1,91,250 = 2,250 (A)

LRV = AH (SR – AR)

= 48,000 {4 – (1,91,250 ÷ 48,000)} = 750 (F)

LITV = No. of Idle hours × SR

= 48,000 – (47,500 ÷ 4) = 1,200 (A)

LEV = SR (SH – AH)

Advanced Management Accounting

$$= 4 \{(60,000 \div 12,000) \times 9,450 - 47,700\} = 1,800 \text{ (A)}$$

(ii) Variable Overhead Variances

$$\begin{aligned}\text{VOC} &= \text{Recovered Overheads} - \text{Actual Overheads} \\ &= 9,450 \times 5 - 45,000 = 2,250 \text{ (F)}\end{aligned}$$

$$\begin{aligned}\text{V.O. (Exp.) V} &= \text{Standard V.O.} - \text{Actual V.O.} \\ &= 47,700 \times 1 - 45,000 = 2,700 \text{ (F)}\end{aligned}$$

$$\begin{aligned}\text{V.O. (Eff.) V} &= \text{Recovered Overheads} - \text{Standard Overheads} \\ &= 9,450 \times 5 - 47,700 = 450 \text{ (A)}\end{aligned}$$

Fixed Overheads Variances

$$\begin{aligned}\text{FOCV} &= \text{Recovered Overheads} - \text{Actual Overheads} \\ &= (1,20,000 \div 12,000) \times 9,450 - 1,20,900 = 94,500 - 1,20,900 \\ &= 26,400 \text{ (A)}\end{aligned}$$

$$\begin{aligned}\text{F.O.(Exp.) V} &= \text{Budgeted Overheads} - \text{Actual Overheads} \\ &= 1,20,000 - 1,20,900 = 900 \text{ (A)}\end{aligned}$$

$$\begin{aligned}\text{FOVV} &= \text{Recovered Overheads} - \text{Budgeted Overheads} \\ &= 95,500 - 1,20,000 = 25,500 \text{ (A)}\end{aligned}$$

Sales Variances

$$\begin{aligned}\text{Sales Price Variance} &= \text{Actual Unit Sold (SP} - \text{AP)} \\ &= 9,000 \{50 - (4,57,500 \div 9,000)\} = 7,500 \text{ (F)}\end{aligned}$$

$$\begin{aligned}\text{Sales Volume Variance (Contribution Loss)} &= \text{S. R. of Profit (Budgeted Qty.} - \text{Actual Qty.)} \\ &= (60,000 \div 12,000) (12,000 - 9,000) = 15,000 \text{ (A)}\end{aligned}$$

Question 17

How are cost variances disposed off in a standard costing system? Explain.

Answer

There is no unanimity of opinion among Cost Accountants regarding the disposition of variances. The following are commonly used methods for their disposition.

1. Transfer all variances to Profit and Loss Account. Under this method, stock of work-in-progress, finished stock and cost of sales are maintained at standard cost and variances arising are transferred to profit and loss account.
2. Distributing variances on pro-rata basis over the cost of sales, work-in-progress and finished goods stocks by using suitable basis.
3. Write off quantity variance to profit and loss account and spread price variance over to cost of sales, work in progress and finished goods. The reason behind apportioning variance to inventories and cost of sales is that they represent costs although they are derived as variances.

Question 18

“Calculation of variances in standard costing is not an end in itself, but a means to an end.” Discuss.

Answer

The crux of standard costing lies in variance analysis. Standard costing is the technique whereby standard costs are predetermined and subsequently compared with the recorded actual costs. It is a technique of cost ascertainment and cost control. It establishes predetermined estimates of the cost of products and services based on management's standards of efficient operation. It thus lays emphasis on “what the cost should be”. These should be costs are when compared with the actual costs. The difference between standard cost and actual cost of actual output is defined as the variance.

The variance in other words is the difference between the actual performance and the standard performance. The calculations of variances are simple. A variance may be favourable or unfavourable. If the actual cost is less than the standard cost, the variance is favourable but if the actual cost is more than the standard cost, the variance will be unfavourable. They are easily expressible and do not provide detailed analysis to enable management of exercise control over them. It is not enough to know the figures of these variances from month to month. We infact are required to trace their origin and causes of occurrence for taking necessary remedial steps to reduce / eliminate them.

A detailed probe into the variance particularly the controllable variances helps the management to ascertain:

- (i) the amount of variance
- (ii) the factors or causes of their occurrence
- (iii) the responsibility to be laid on executives and departments and
- (iv) corrective actions which should be taken to obviate or reduce the variances.

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Mere calculation and analysis of variances is of no use. The success of variance analysis depends upon how quickly and effectively the corrective actions can be taken on the analysed variances. In fact variance gives information. The manager needs to act on the information provided for taking corrective action. Information is the means and action taken on it is the end. In other words, the calculation of variances in standard costing is not an end in itself, but a means to an end.

Question 19

Describe three distinct groups of variances that arise in standard costing.

Answer

The three distinct groups of variances that arise in standard costing are:

The three distinct groups of variances that arise in standard costing are:

- (i) Variances of efficiency. These are the variance, which arise due to efficiency or inefficiency in use of material, labour etc.
- (ii) Variances of prices and rates: These are the variances, which arise due to changes in procurement price and standard price.
- (iii) Variances due to volume: These represent the effect of difference between actual activity and standard level of activity. These can be summarized as under:

<i>Element of cost</i>	<i>Variance of Efficiency</i>	<i>Variance of price</i>	<i>Variance of volume</i>
Material	Usage, Mixture, Yield	Price	Revision
Labour	Efficiency, idle time	Rate of pay	--
- Variable	Efficiency	Expenditure	Revision
- Fixed	Efficiency	Expenditure	Revision
			Capacity
			Calendar

Question 20

“Standard costing variances centre around comparison of actual Performance with the standard and the standards or plans are normally based on the environment anticipated when the targets are set and if the current environment is different from that anticipated, such analysis cannot measure managerial performance”. Comment on the statement and how will you deal with the situation with reference to material, labour and sales variances.

Answer

- (a) The statement give in the question highlights practical difficulties faced by our industries today.

When the current environmental conditions are different from the anticipated environmental conditions (prevailing at the time of setting standard or plans) the use of routine analysis of variance for measuring managerial performance is not desirable / suitable.

The variance analysis can be useful for measuring managerial performance if the variances computed are determined on the basis of revised targets / standards based on current actual environmental conditions. In order to deal with the above situation i.e. to measure managerial performance with reference to material, labour and sales variances, it is necessary to proceed and compute the following variances.

Material variances:

In the case of material purchase price variance, suppose the standard price of raw material determined was Rs.5 per unit, the general market price per unit at the time of purchase was Rs.5.20 and actual price paid per unit was Rs.5.18 on the purchase of say 10,000 units of raw material.

In this case the variances to be computed should be:

Uncontrollable material purchase price planning variance:

= (Standard price p.u. – General market price p.u.) Actual quantity purchased

= (Rs.5 – Rs.5.20) 10,000 units = Rs.2,000 (Adverse)

Controllable material purchase price efficiency variance:

= (General market price p.u. – Actual price paid p.u.) Actual quantity purchased

= (Rs.5.20 – 5.18) 10,000 units

= Rs.200 (Fav.)

In the case of material usage variance, suppose the standard quantity per unit be 5 kgs, actual production units be 250 and actual quantity of material used is 1,450 kgs. Standard cost of material per kg. was Re.1. Because of shortage of skilled labour it was felt necessary to use unskilled labour and that increased material usage by 20%. The variances to be computed to deal with the current environmental conditions will be: Uncontrollable material usage planning variances:

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= (Original std. quantity in kgs. – Revised std. quantity in kgs.) Standard price per kg.

= (1,250 kgs. – 1,500 kgs) Re.1

= Rs.250 (Adverse)

Controllable material usage efficiency variance:

= (Revised standard quantity in kgs. Actual quantity used in kgs.) Standard price per kg.

= (1,500 kgs. – 1,450 kgs.) Re.1

= Rs.50 (Favourable)

Labour variances:

Like material variances, here also labour efficiency and wage rate variances should also be adjusted to reflect changes in environmental conditions that prevailed during the period. The labour efficiency variances would be equivalent to the following two variances.

(a) Uncontrollable labour efficiency planning variance

(b) Controllable labour efficiency variance

The above variances would arise when unskilled labour is substituted for skilled labour.

Similarly, one uncontrollable and other controllable variance would arise in the case of wage rate variance as well under current environmental conditions.

Sales variances:

The conventional sales volume variance reports the difference between actual and budgeted sales, priced at the budgeted contribution per unit. The variance merely indicates whether sales volume is greater or less than expected. It does not indicate how well sales management actual sales volume should be compared with an expert estimate that reflects the market conditions prevailing during that period.

Total sales margin variance (planning element):

= {Expert's budgeted sales volume × (Expert's selling price – Standard cost) – Original budgeted sales volume × (Budgeted selling price – Standard cost)}

Total sales margin variance (appraisal element):

= {Actual sales volume × (Actual selling price – Standard cost)}

= Expert's budgeted sales volume × (Expert's selling price – Standard cost)}

The figure of "Expert's budgeted sales volume" for a particular product can be determined by estimating the total market sales volume for the period and then multiplying the estimate by the target percentage of market share.

EXERCISE

Question 1

Super Computers manufactures and sells three related PC models:

- (1) PC = Sold mostly to college students.
- (2) Portable PC = Smaller version of PC positioned as home computer
- (3) Super PC = Sold mostly to business executives.

Budgeted and actual data for 1995 is as follows:

Budget for 1995

	Selling Price per Unit Rs.	Variable Cost per Unit Rs.	Contribution margin per Unit Rs.	Sales Volume in Units Rs.
PC	24,000	14,000	10,000	7,000
Portable PC	16,000	10,000	6,000	1,000
Super PC	1,00,000	60,000	40,000	2,000
				10,000

Actual for 1995

	Selling Price per Unit Rs.	Variable Cost per Unit Rs.	Contribution margin per Unit Rs.	Sales Volume in Units Rs.
PC	22,000	10,000	12,000	8,250
Portable PC	13,000	8,000	5,000	1,650
Super PC	70,000	50,000	20,000	1,100
				11,000

Super computers derived its total unit sales budget for 1995 from the internal management estimate of a 20% market share and an industry sales forecast by computer manufactures association of 50,000 units. At the end of the year the association reported actual industry sales of 68,750 units.

Required:

- (i) Compute the individual product and total sales volume variance.
- (ii) Compute total sales quantity variance.

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- (iii) Compute the market size and market share variance.
- (iv) Compute individual product and total sales mix variances.
- (v) Comment on your results.

Answer

- (i) Total Sales Volume Variance = Rs.1,96,00,000 (Adv.)
 - (ii) Total sales quantity variance = Rs.1,56,00,000 (Fav.)
 - (iii) Market size variance = Rs.5,85,00,000 (Fav.)
 - (iv) Market share variance = Rs.4,29,00,000 (Adv.)
 - (iv) Computation of individual product and total sales mix variances
1. Individual product and total sales mix variance:
Sales mix variance:
PC = Rs.30,80,000 (Adv.)
Super PC = Rs.2,68,40,000 (Adv.)
 2. Total sales mix variance = Rs.3,52,00,000 (Adv.)

Question 2

GLOBAL LTD. is engaged in marketing of wide range of consumer goods. A, B, C and D are the zonal sales officers for four zones. The company fixes annual sales target for them individually. You are furnished with the following:

- (1) The standard costs of sales target in respect of A, B, C and D are Rs.5,00,000, Rs.3,75,000, Rs.4,00,000 and Rs.4,25,000 respectively.
- (2) A, B, C and D respectively earned Rs.29,900, Rs.23,500, Rs.24,500 and Rs.25,800 as commission at 5% on actual sales effected by them during the previous year.
- (3) The relevant variances as computed by a qualified cost accountant are as follows:

	A	B	C	D
	Rs.	Rs.	Rs.	Rs.
Sales price variance	4,000 (F)	6,000 (A)	5,000 (A)	2,000 (A)
Sales volume variance	6,000 (A)	26,000 (F)	15,000 (F)	8,000 (F)
Sales margin mix variance	14,000 (A)	8,000 (F)	17,000 (F)	3,000 (A)

(A) = Adverse variance and (F) = Favourable variance.

Standard Costing

You are required to:

- (1) Compute the amount of sales target fixed and the actual amount of contribution earned in case of each of the zonal sales officer.
- (2) Evaluate the overall performance of these zonal sales officers taking three relevant base factors and then recommend whose performance is the best.

Answer

	(Rs.'000)			
Zonal Sales Officers	A	B	C	D
Sales target / Budgeted sales	600	450	480	510
Standard cost of sales target	<u>500</u>	<u>375</u>	<u>400</u>	<u>425</u>
Standard margin/ Budgeted margin	100	75	80	85
Sales margin mix variance	14 (A)	8 (F)	17 (F)	3 (A)
Sales price variance	<u>4 (F)</u>	<u>6 (A)</u>	<u>5 (A)</u>	<u>2 (A)</u>
Actual margin	90	77	92	80

Question 3

The following information is available in respect of Y Ltd. for a week:

- (a) 400 kg of raw material were actually used in producing product 'EXE'. The purchase cost thereof being Rs.24,800. The standard price per kg of raw material is Rs.60. The expected output is 12 units of product 'EXE' from each kg of raw material. Raw material price variance and usage variance as computed by cost accountant are Rs.800 (adverse) and Rs.600 (adverse) respectively.
- (b) The week is of 40 hours. The standard time to produce one unit of 'EXE' is 30 minutes. The standard wage rate is Rs.5 per labour hour. The company employs 60 workers who have been paid hourly wage rate as under:

Number of workers	6	8	46
Hourly Wage Rate (Rs.)	4.80	5.20	5.00

- (c) Budgeted overheads for a four-weekly period is Rs.81,600. The actual fixed overheads spent during the said week are Rs.19,800.
- (d) Entire output of 'EXE' has been sold at its standard selling price of Rs.15 per unit.

You are required to:

- (i) Compute the variances relating to labour and overheads.

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- (ii) Prepare a statement showing total standard costs, standard profit, and actual profit for the week.

Answer

Labour cost variance = Rs. 316 (Adverse)

Labour Rate Variance = Rs.16 (Adv.)

Labour efficiency variance = Rs.300 (Adv.)

Total fixed overhead cost variance = Rs.90 (Fav.)

Fixed overhead volume variance = Rs.510 (Adv.)

Fixed overhead expenditure variance = Rs.600 (Fav.)

Actual Profit = Rs. 13,584

Question 4

The Standard Cost of producing one unit of Item 'Q' is as under:

Direct Material --	A – 12 Kg. @ Rs.10/-	= Rs.120
	B – 5 kg. @ Rs.6/-	= Rs.30
Direct Wages --	5 hrs. @ Rs.3/-	= Rs.15
Fixed Production Overheads		= Rs.35
Total Standard Cost:		= Rs.200
Standard Gross Profit		= Rs.50
Standard Sale Price		= Rs.250

Fixed Production overhead is absorbed on expected annual output of 13,200 units.

Actual result for the month of September, 1997 are under:

Actual Production:	1,000 units	
		Rs.
Sales	1,000 Units @ Rs.250	= 2,50,000
Direct Material --	A – 11,000 kg.	= 1,21,000
	B – 5,200 kg.	= 28,600
Direct wages	5,500 hrs.	= 17,500
Fixed Overheads		= 39,000
		= 2,06,100
	Gross profit	= 43,900

You are required to calculate all variances. Material price variance is taken out at the time of receipt of Material. Material purchases were:

12,000 kg. 'A' @ Rs.11 & 5,000 kg. of 'B' @ Rs.5.50

Answer

Material cost variance	= Rs.400 (Fav.)
Material price variance	= Rs.8,400 (Adv.)
Material usage variance	= Rs.8,800 (Fav.)
Material mix variance	= Rs.1,741.18 (Fav.)
Material yield variance	= Rs.7058.82 (Fav.)
Material purchase price variance	= Rs.9,500 (Adv.)
Labour cost variance	= Rs.2,500 (Adv.)
Labour rate variance	= Rs.1,000 (Adv.)
Labour efficiency variance	= Rs.1,500 (Adv.)
Total fixed overhead variance	= Rs.4,000 (Adv.)
Fixed overhead expenditure variance	= Rs.500 (Adv.)
Fixed overhead volume variance	= Rs.3,500 (Adv.)
Efficiency variance	= Rs.3,500 (Adv.)

Question 5

On 1st April, 1998, ZED Company began the manufacture of a new electronic gadget. The company installed a standard costing system to account for manufacturing costs.

The standard costs for a unit of the product are as under:

	Rs.
<i>Direct Material (3 kg at Rs.5 per kg.)</i>	<i>15.00</i>
<i>Direct Labour (0.5 hour at Rs.20 per hour)</i>	<i>10.00</i>
<i>Manufacturing Overhead (75% of direct labour cost)</i>	<i>7.50</i>
<i>Total Cost</i>	<i>32.50</i>

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The following data was obtained from ZED Company's records for April 1998:

	Debit	Credit
	Rs.	Rs.
Sales	--	1,25,000
Sundry Creditors (for purchase of direct materials in April 1998)	68,250	--
Direct Material Price Variance	3,250	--
Direct Labour Rate Variance	2,500	--
Direct Labour Rate Variance	1,900	--
Direct Labour Efficiency Variance	--	2,000

The Actual Production in April 1998 was 4,000 units of the gadget and the actual sales for the month was 2,500 units.

The amount shown above for direct materials price variance applies to materials purchase during April, 1998. There was no opening stock of raw materials on 1st April, 1998.

Required:

Calculate for April, 1998 the following:

- (i) Standard direct labour hours allowed for the actual output achieved.
- (ii) Actual direct labour hours worked.
- (iii) Actual direct labour rate.
- (iv) Standard quantity of direct materials allowed (in kgs.)
- (v) Actual quantity of direct materials used (in kgs.)
- (vi) Actual quantity of direct materials purchased (in kgs.)
- (vii) Actual direct materials price per kg.

Answer

- (i) Standard direct labour hours allowed for the actual output achieved = 2,000 hours.
- (ii) Actual direct labour hour worked = 1,900 hours.
- (iii) Actual direct labour rate = Rs.21
- (iv) Standard quantity of direct materials allowed (in kgs.) = 12,000 Kgs.
- (v) Actual quantity of direct materials used (in Kgs.)
or Actual qty. of direct materials used for actual output = 12,500 Kgs.

(vi) Actual quantity of direct materials purchased (in Kgs.) = Rs.13,000 Kgs.

(vii) Actual direct materials price per Kg.= Rs.5.25

Question 6

Despite the increase in the Sales price of its sole product to the extent of 20%, a company finds that it has incurred a loss during the year 1998-99 to the extent of Rs.4 lakhs as against a profit of Rs.5 lakhs made in 1997-98. This adverse situation is attributed mainly to the increase in prices of materials and overheads, the increase over the previous year being, on the average, 15% and 10% respectively.

The following figures are extracted from the books of the company.

	31..03.98	31.03.99
	Rs.	Rs.
Sales	1,20,00,000	1,29,60,000
Cost of Sales:		
Material	80,00,000	91,10,000
Variable Overhead	20,00,000	24,00,000
Fixed Overhead	15,00,000	18,50,000

Required:

Analyse the variances over the year in order to bring out the reasons for the fail in profit

Answer

Sales price variance	= Rs.21.60 (Lakhs) (Fav.)
Material price variance	= 11.88 (Lakhs) (Adv.)
Variable overhead expenditure variance	= Rs.2.18 (Lakhs) (Adv.)
Variable overhead efficiency variance	= Rs.3.62 (Lakhs) (Adv.)
Fixed overhead expenditure variance	= Rs.1.68 (Lakhs) (Adv.)
Fixed overhead volume variance	= Rs.1.82 (Lakhs) (Adv.)

Question 7

Following the standard cost card of a component:

Materials	2 units at Rs.15	Rs.30
Labour	3 Hours at Rs.20	Rs.60
Total overheads	3 Hours at Rs.10	Rs.30

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During a particular month 10,000 units of the component were produced and the same was found to be at 60% capacity of the budget. In preparing the variance report for the month, the cost accountant gathered the following information:

<i>Labour</i>	<i>Rs.6,50,000</i>
<i>Variable overheads</i>	<i>Rs.2,00,000</i>
<i>Fixed overheads</i>	<i>Rs.3,00,000</i>
<i>Material price variance</i>	<i>Rs.70,000 (A)</i>
<i>Material cost variance</i>	<i>Rs.50,000 (A)</i>
<i>Labour rate variance</i>	<i>Rs.50,000 (F)</i>
<i>Fixed overhead expenditure variance</i>	<i>Rs.50,000 (A)</i>

You are required to prepare from the above details:

- (1) Actual material cost incurred*
- (2) Standard cost of materials actually consumed*
- (3) Labour efficiency variance*
- (4) Variable OH efficiency variance*
- (5) Variable OH expenditure variance*
- (6) Fixed OH efficiency variance*
- (7) Fixed OH capacity variance*
- (8) Fixed OH volume variance*

Answer

- | | |
|--|----------------------|
| (1) Actual material cost incurred | = Rs. 3,50,000 |
| (2) Standard cost of materials actually consumed | = Rs.2,80,000 |
| (3) Labour efficiency variance | = Rs.1,00,000 (Adv.) |
| (4) Variable OH efficiency variance | = Rs.25,000 (Adv.) |
| (5) Variable OH expenditure variance | = Rs.25,000 (Adv.) |
| (6) Fixed OH efficiency variance | = Rs.25,000 (Adv.) |
| (7) Fixed OH capacity variance | = Rs.75,000 (Adv.) |
| (8) Fixed OH volume variance | = Rs.1,00,000 (Adv.) |

Question 8

F Manufacturing Ltd., uses the three variances method to analyse the manufacturing overhead variances for the fiscal year just ended were computed as follows:

<i>Spending</i>	<i>Rs.86,000</i>	<i>Adverse</i>
<i>Efficiency</i>	<i>Rs.36,000</i>	<i>Favourable</i>
<i>Volume</i>	<i>Rs.80,000</i>	<i>Favourable</i>

The manufacturing overhead application rate for the year was Rs.160 per machine hours of which Rs.60 per machine hour was the variable component. The year end balance the manufacturing overhead control account was Rs.16,50,000 and the standard machine hours for the year were 11,300.

From the above data compute:

- (i) Budgeted Machine Hours*
- (ii) Actual Machine Hours*
- (iii) Applied Manufacturing Overhead*
- (iv) Total Amount of Fixed Overhead Cost*

Answer

- (i) Budgeted Machine Hours = 10,500 hours
- (ii) Actual machine Hours = 10,700 hours.
- (iii) Applied Manufacturing Overhead = Rs.16,80,000
- (iv) Total Amount of Fixed Overhead Cost = Rs.9,22,000