PONDICHERRY UNIVERSITY

DIRECTORATE OF DISTANCE EDUCATION

MBA – 1ST SEMESTER
ACCOUNTING FOR MANAGER

UNIT - 5 – COST SHEET & VARIANCE ANALYSIS

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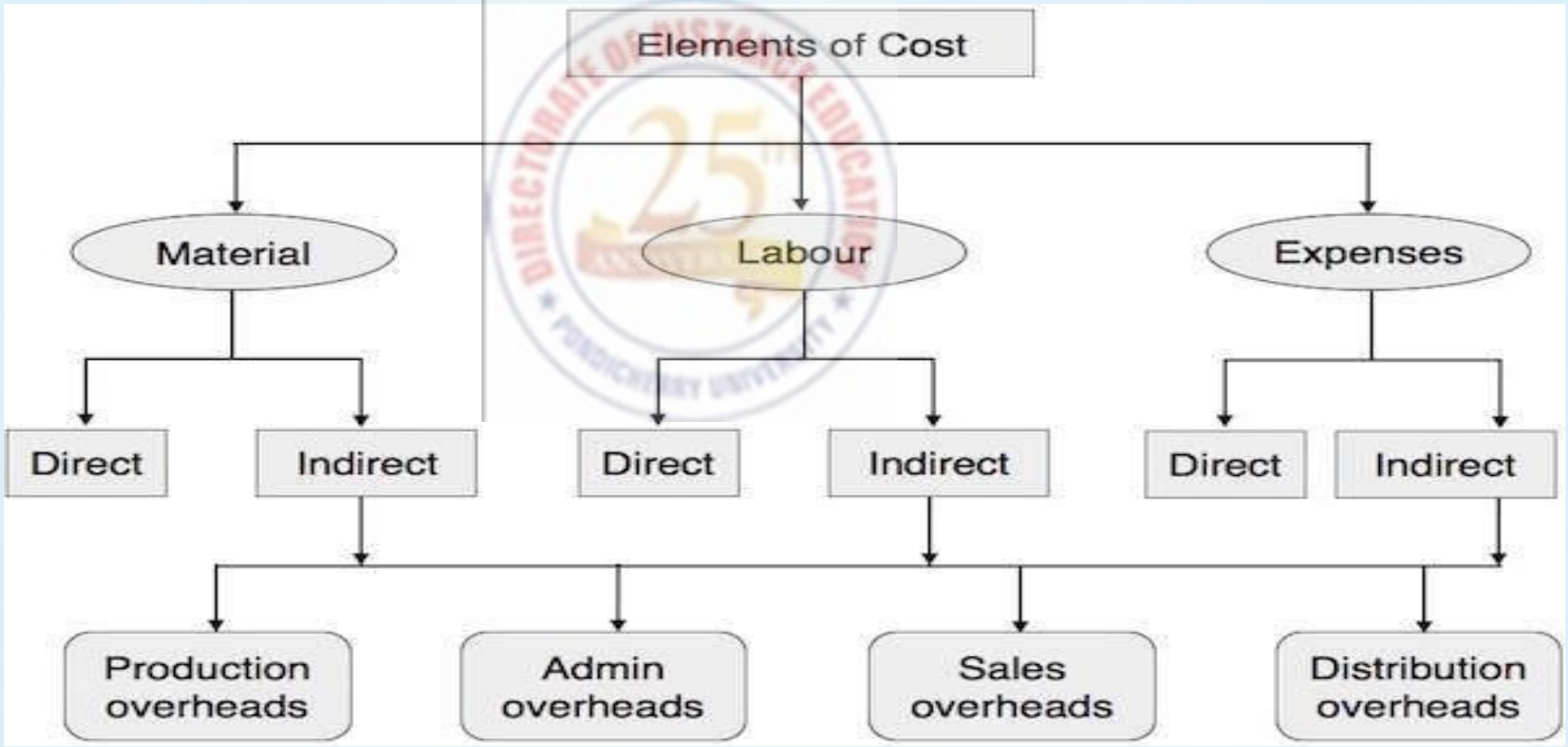
COST ACCOUNTING

Cost accounting is the application of accounting and costing principles, methods, and techniques in the ascertainment of costs and the analysis of saving or excess cost incurred as compared with previous experience or with standards. …Wheldon.

Cost: There is a cost involved to purchase or produce anything.



ELEMENTS OF COST

1. **Direct or Indirect Materials**

The materials directly contributed to a product and those easily identifiable in the finished product are called direct materials. For example, paper in books, wood in furniture, plastic in water tank, and leather in shoes are direct materials. They are also known as high-value items. Other lower cost items or supporting material used in the production of any finished product are called indirect material. For example, nails in shoes or furniture.

2. **Direct Labor**

Any wages paid to workers or a group of workers which may directly co-relate to any specific activity of production, supervision, maintenance, transportation of material, or product, and directly associate in conversion of raw material into finished goods are called direct labor. Wages paid to trainee or apprentices does not comes under category of direct labor as they have no significant value.

3. **Overheads**

Indirect expenses are called overheads, which include material and labor. Overheads are classified as:

- Production or manufacturing overheads
- Administrative expenses
- Selling Expenses
- Distribution expenses
- Research and development expenses

CLASSIFICATION OF COST

1] **Classification by Nature**

There are three broad categories of costs based on by nature, namely Materials Cost, Labor Cost and Expenses

- ***Material Costs***: Material costs are the costs of any materials use in the production of goods.
- ***Labor Costs***: Labor costs consists of wages paid to employees in manufacturing of goods
- ***Expenses***: All other expenses associated with making and selling the goods or services.

2] Classification by Functions

The grouping of costs is according to the broad divisions of functions such as production, administration, selling etc.

- ***Production Costs***: All costs concerned with actual manufacturing or construction of the goods
- ***Commercial Costs***: It includes the admin costs, selling and distribution costs etc.

3] Classification by Traceability

This classification is based on the degree of traceability to the final product of the firm.

- ***Direct Costs***: Direct costs are easily identified with a specific cost unit or cost centers.
- ***Indirect Costs***: It cannot easily identify them to one particular cost center. Example the rent of the building or the salary of the manager.

4] Classification by Normality

This classification determines the costs as normal costs and abnormal costs.

- ***Normal Costs***: This is a part of the cost of production and a part of the costing profit and loss. These are the costs that the firm incurs at the normal level of output in standard conditions.
- ***Abnormal Costs***: These costs are not normally incurred at a given level of output in conditions in which normal levels of output occur. These costs are charged to the profit and loss account, they are not a part of the cost of production.

Cost Sheet

A cost sheet is prepared to know the outcome and breakup of costs for a particular accounting period. The cost sheets are prepared as per the requirements of the management, the information to be incorporated in a cost sheet should comprise of cost per unit and the total cost for the current period along with the cost per unit and the total cost of preceding period. Data of financial statement is used for preparation of cost sheet. Therefore, reconciliation of cost sheet and financial statement should be done on a regular interval.

COST SHEET OR STATEMENT OF COST

	Total Units.....	
Opening Stock of Raw Materials	... ...	... ...
Add: Purchases	... ...	... ...
Add: Carriage inwards – raw materials	... ...	... ...
Less: Closing Stock	... ...	... ...
Cost of Material Consumed or Direct Material	... ...	... ...
Add: Direct Labour and Direct Expenses	... ...	... ...
Prime Cost →	... ...	... ...
Add: Works/Factory overheads	... ...	... ...
Works Cost →	... ...	... ...
Add: Office/Administration overheads	... ...	... ...
Cost of Production →	... ...	... ...
Add: Selling and distribution overheads	... ...	... ...
Total Cost or Cost of Sales →		

ITEMS EXCLUDED FROM COST

The following items are of financial nature and thus not included while preparing a cost sheet:

1. Cash discount
2. Interest paid
3. Preliminary expenses written off
4. Goodwill written off
5. Provision for taxation
6. Provision for bad debts
7. Transfer to reserves
8. Donations
9. Income-tax paid
10. Dividend paid
11. Profit/loss on sale of fixed assets
12. Damages payable at law, etc.

Prob.1: Prepare a cost sheet of the following data relating to the manufacture of Jeans:

Number of Jeans manufactured during the month	1,000
Direct materials consumed	20,000
Direct labour	8,000
Indirect labour (in factory)	2,500
Supervision costs (in factory)	1,000
Factory premises rent	1,600
Factory lighting	600
Oil for machines	100
Depreciation of machines	500
Office overheads	8,000
Office salaries	2,000
Misc. office expenses	1,000
Selling and distribution overheads	6,000

Note: A profit margin of 20% on the total cost of goods is expected on the sale of Jeans

Solution: **Cost Sheets for the ----------**

Particulars			Total for 1,000 units	Per unit
			Rs.	Rs. P.
Direct materials		20,000		
Direct labour		8,000		
	Prime Cost		28,000	28.00
Works/Factory Overheads:				
Indirect labour		2,500		
Supervision costs		1,000		
Factory rent		1,600		
Factory lighting		600		
Oil for machines		100		
Dep. of machines		500	6,300	6.30
	Works Cost		34,300	34.30
Office and Adm. Overheads:				
Office overheads		8,000		
Office salaries		2,000		
Misc. expenses		1,000	11,000	11.00
	Cost of Production		45,300	45.30
Selling and Distribution Overheads			6,000	6.00
	Total Cost		51,300	51.30
Profit 20% of Total Cost			10,260	10.26
	Sales		61,560	61.56

THE BANGALORE LTD. SUPPLIES YOU THE FOLLOWING INFORMATION AND REQUIRES YOU TO PREPARE A COST SHEET.

Stock of raw materials on 1st Sept., 2013	75,000
Stock of raw materials on 30th Sept., 2013	91,500
Direct wages	52,500
Indirect wages	2,750
Sales	2,00,000
Work-in-progress on 1st Sept., 2013	28,000
Work-in-progress on 30th Sept., 2013	35,000
Purchases of raw materials	66,000
Factory rent, rates and power	15,000
Depreciation of plant and machinery	3,500
Expenses on purchases	1,500
Carriage outward	2,500
Advertising	3,500
Office rent and taxes	2,500
Travellers' wages and commission	6,500
Stock of finished goods on 1st Sept., 2013	54,000
Stock of finished goods on 30th Sept., 2013	31,000

Solution: Costs Sheet of the Bangalore Ltd for the month of Sept 2013

	Opening Stock of raw material (1st Sept.)	75,000	
Add:	Purchases	66,000	
	Expenses on purchases	1,500	
		1,42,500	
Less:	Closing Stock of raw material (30th Sept.)	91,500	
	Materials consumed		51,000
	Direct wages		52,500
	Prime Cost		1,03,500
Add:	Opening Work-in-progress (1st Sept.)		28,000
	Factory Overheads :		
	Indirect wages	2,750	
	Factory rent, rates and power	15,000	
	Depreciation of plant and machinery	3,500	21,250
			1,52,750
Less:	Closing Work-in-progress (30th Sept.)		35,000
	Works Cost		1,17,750
	Office and Administration Overheads : Office rent and taxes		2,500
	Cost of Production		1,20,250
Add:	Opening Stock of finished goods (1st Sept.)		54,000
			1,74,250
Less:	Closing Stock of finished goods (30th Sept.)		31,000
	Cost of Goods Sold		1,43,250
	Selling and Distribution Overheads :		
	Carriage outward	2,500	
	Advertising	3,500	
	Travellers' wages and commission	6,500	12,500
	Cost of Sales		1,55,750
	Profit		44,250
	Sales		2,00,000

STANDARD COSTING AND VARIANCE ANALYSIS

Definition and concept

Standard cost

Standard Cost as defined by the Institute of Cost and Management Accountant, London "is the **Predetermined Cost** based on technical estimate for materials, labour and overhead for a selected period of time and for a prescribed set of working conditions."

- An estimated or pre-determined cost of performing an operation or producing a good or service, under normal conditions.
- It is used as a basis for cost control through variance analysis.

Standard Costing

Chartered Institute of Management Accountants England defines Standard Costing as "the Preparation and use of standard costs, their comparison with actual costs and the analysis of variances to their causes and points of incidence."

- It is a cost accounting technique for cost control where standard costs are determined and compared with actual costs, to initiate corrective action.
- It is a control method involving the preparation of detailed cost and sales budgets. A management tool used to facilitate management by exception.

A standard costing system consists of the following four elements:

1. Setting standards for each operation.
2. Comparing actual with standard performance.
3. Analysing and reporting variances arising from the difference between actual and standard performance.
4. Investigating significant variances and taking appropriate competitive action.

Variance analysis

The term "Variances" may be defined as the difference between Standard Cost and actual cost for each element of cost incurred during a particular period.

The variance may be favourable variance or unfavourable variance. When the actual performance is better than the Standard, it resents "Favourable Variance." Similarly, where actual performance is below the standard it is called as "Unfavourable Variance."

Variance analysis helps to fix the responsibility so that management can ascertain

- The amount of the variance
- The reasons for the difference between the actual performance and budgeted performance
- The person responsible for poor performance
- Remedial actions to be taken

Types of Variance Analysis Formula

Variance Analysis can be broadly classified into the following heads:

1. Material Variance
2. Labour Variance
3. Variable Overhead Variance
4. Fixed Overhead Variance
5. Sales Variance

Direct Material Variances

1. **Material Cost Variances (MCV):** The Material Cost Variance is the difference between the Standard cost of materials for the ***Actual Output*** and the Actual Cost of materials used for producing Actual output.

MCV = SC - AC (or) MCV = (SQ x SP) - (AQ x AP)

Where, SC = standard cost; AC = actual cost; SQ = standard quantity; SP = standard price; AQ = actual quantity; AP = actual price.

2. Material Price Variance (MPV) : MPV is the difference between the standard cost of actual quantity and actual cost for actual quantity.

MPV = (SP - AP) x AQ

3. Material Usage Variance (MUV): MUV is the difference between the standard cost of standard quantity of material for actual output and the Standard cost of the actual material used.

MUV = SP x (SQ - AQ)

4 Materials Yield Variance (MYV): It is the portion of Material Usage Variance. This variance arises due to spoilage, low quality of materials and defective production planning etc. Materials Yield Variance may be defined as "the difference between the Standard Yield Specified and the Actual Yield Obtained." This variance may be calculated as under:

MYV = SR x (AY - SY)

Where, AY= Actual Yield, SY = Standard Yield and Standard Rate is calculated as follows :

Standard Rate = Standard cost of standard mix / Net standard output.

5. Material Mix Variance (MMV) : It is the portion of the material usage variance which is due to the difference between the Standard and the actual composition of mix. Material Mix Variance is calculated under two situations as follows :

a. When Actual Weight and Standard Weight of Mix are equal :

(i) The formula is used to calculate the Variance:

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

(i) In case standard quantity is revised due to shortage of a particular category of materials, the formula will be changed as follows :

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

Where, RSQ = Revised standard quantity

b. When Actual Weight and Standard Weight of Mix are different:

(i) The formula used to calculate the Variance is :

MMV = (Total weight of actual mix/ Total weight of standard mix X standard cost of standard mix) - standard cost of actual mix

(i) In case the standard is revised due to the shortage of a particular category of materials, the alternative formula will be as follows:

MMV = (Total weight of actual mix/ Total weight of standard mix X standard cost of revised standard mix) - standard cost of actual mix

Verification:

1. MCV = MPV + MUV
2. MUV = MMV + MYV

Notes- positive means favourable(F) and negative means adverse(A).

Problem – 1: A manufacturing concern, which has adopted standard costing, furnished the following information:

- Standard Material for **70 kg finished product**: 100 kg of raw material required and the Price of materials: Re. 1 per kg.
- Actual Output: 2,10,000 kg. Material used: 2,80,000 kg. Cost of material: Rs. 2,52,000.

Calculate:(a) Material Usage Variance (b) Material Price Variance (C) Material Cost Variance

Solution:

(1) Standard quantity	For 70 kg standard output
	Standard quantity of material = 100 kg.
	2,10,000 kg. of finished products
	$\frac{2,10,000 \times 100}{70}$ = 3,00,000 kg.
(2) Actual price per kg.	$\frac{Rs.2,52,000}{2,80,000}$ = Re.0.90

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

(b) Material Price Variance	=Actual quantity(Standard price -Actual price)
	2,80,000 (Re.1 – Re.0.90)
	2,80,000 x Re.0.10
	Rs. 28,000 (Favorable)
(c) Material Cost Variance	= Standard quantity for actual output x Standard rate) – (Actual quantity x Actual rate)
	=(3,00,000 x 1) – (2,80,000 x 0.90)
	= Rs.3,00,000 x Rs. 2,52,000
	Rs.48,000 (favorable)

Verification:

MCV = MPV + MUV

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

Prob.2: The standard mix to produce one unit of product is as follows:

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

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

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

Solution:

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

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

(1) Material Cost Variance	= Standard cost – Actual cost
	=Rs. 50,000 – Rs.52,225
MCV	= Rs.2,225(A)
(2) Material Price Variance	=(St. Price – Actual Price) x Actual Qty
Material A	= (15- 17.50) x 640 = Rs. 1,600 (A)
Material B	= (20 – 18) x 950 = Rs. 1,900 (F)
Material C	= (25 – 27.50) x 870 = Rs. 2,175 (A)
MPV	= Rs.1,875 (A)
(3) Material Usage Variance	= (St. Qty – Actual Qty.) x St. Price
Material A	= (600 – 640) x 15 = Rs. 600(A)
Material B	= (800- 950) x 20 = Rs.3,000 (A)
Material C	= (1,000 – 870) x 25 = Rs. 3,250 (F)
MUV	= Rs.350 (A)

(4) Material Mix Variance	= (Revised St. Qty – Actual Qty.) x St. Price
Material A	= (615* - 640) x 15 = Rs.375 (A)
Material B	=(820* - 950) x 20 = Rs. 2,600 (A)
Material C	= (1,025* - 870) x 25 = Rs. 3,875 (F)
MMV	= Rs. 900(F)

*Revised Standard Quantity is calculated as follows:

Total weight of Actual mix X Standard Material / Total weight of standard mix

Material A =	$\frac{2,460 \times 600}{2400}$	= 615 Units
Material B =	$\frac{2,460 \times 800}{2400}$	= 820 Units
Material C =	$\frac{2,460 \times 1,000}{2,400}$	= 1,025 Units

(5) Material Yield Variance	= (Actual yield – Standard yield) x St. output price
2460/240 = 10.25 units	= (10 -10.25) x 5000 = Rs. 1,250 (A)

Verification: MCV = MPV + MMV + MYV

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

Labour Variances

1. **Labour Cost Variance (LCV):** Labour Cost Variance is the difference between the Standard Cost of labour allowed for the actual output achieved and the actual wages paid.

Labour Cost Variance = Standard Cost of Labour - Actual Cost of Labour (or)

Labour Cost Variance = {SR x SH for AO} - { AR x AH}

Where, SR = Standard Rate, ST = Standard Hour, AO = Actual Output, AR = Actual Rate, AT = Actual Hour.

2. **Labour Rate Variance (LRV):** It is that part of labour cost variance which is due to the difference between the standard rate specified and the actual rate paid.

LRV = AH (SR - AR)

3. **Labour Efficiency Variance (LEV):** Labour Efficiency Variance otherwise known as Labour Time Variance. It is that portion of the Labour Cost Variance which arises due to the difference between standard labour hours specified and the actual labour hours spent. The usual reasons for this variance are (a) poor supervision (b) poor working condition (c) increase in labour turnover (d) defective materials.

LEV = SR (SH - effective AH)

4. **Labour Idle Time Variance:** Labour Idle Time Variance arises due to abnormal situations like strikes, lockout, breakdown of machinery etc. In other words, idle time occurs due to the difference between the time for which workers are paid and that which they actually expend upon production.

Idle Time Variance = Idle Hours x Standard Rate

5. **Labour Mix Variance (LMV):** It is otherwise known as Gang Composition Variance. This variance arises due to the differences between the actual gang composition than the standard gang composition. Labour Mix Variance is calculated in the same way of Materials Mix Variance.

This variance is calculated in two ways:

a) **When Standard and actual times of the labour mix are same:** The formula for its computation may be as follows :

LMV = Standard cost of standard labour mix - Standard cost of Actual labour mix.

b) **When Standard and actual times of the labour mix are different :** Changes in the composition of a gang may arise due to shortage of a particular grade of labour. It may be calculated as follows :

LMV = (RSH - AH) x SR

Where, Revised Standard Hour (RSH) = Total Actual Hour/ Total standard hour X actual hour.

6. **Labour Yield Variance (LYV):** 'This variance is calculated in the same way as Material Yield Variance. Labour Yield Variance arises due to the variation in labour cost on account of increase or decrease in yield or output as compared to relative standard. The formula for this purpose is as follows:

LYV = Standard labour cost per unit of output X (Standard output for actual hour - actual output)

Verification:

- Labour Cost Variance = Labour Rate Variance + Labour Efficiency Variance
- Labour Efficiency Variance = Labour Mix Variance + Labour Yield Variance

Problem – 3

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

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

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

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

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

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

1. LCV: SC -AC LCV = 12,000 - 12,400 = **Rs. 400 (A)**

2. LRV: (SR - AR) x AH

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

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

= Rs. 300 (A)

3. LEV: (SH - AH) x SR

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

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

= Rs. 100 (A)

4. LMV: (RSH - AH) x SR

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

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

= Rs. 140 (F)

Working: Revised standard Hours:

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

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

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