13 CHAPTER

Standard Costing

Standard Cost	• It is the pre-determined cost based on technical estimates for materials, labour and overheads for a selected period of time for a prescribed set of working conditions. • It may be used as a basis for price fixation and for cost control through variance analysis. • These costs provide for normal wastage, normal break down, normal idle capacity, etc. • Standard costs are generally established by cost and management accountants in consultation with relevant technical experts and management.
Types of Standards	• **Basic/Fixed/Static/Bogey Standard** - It is a standard which is established for some base year and remain in use for a long period of time. Variances from basic standards indicate the trends of deviations of actual cost from the basic cost. It has no practical utility from the point of view of cost control. • **Current Standard -** It is a standard which is established for a limited period and is related to current conditions. These standards call for periodical review and frequent revisions. These standards are easily understood and have proved most useful for managerial control. • **Ideal/Theoretical Standard -** It is a standard which is based on perfect performance without making any allowance for unavoidable losses (e.g. Normal idle time, normal waste/scrap/defectives/spoilage etc.). It is merely a theoretical standard which is unrealistic and unattainable. Variances from ideal standard generally indicate unfavorable deviations. • **Expected/Attainable/Practical Standard -** It is a standard which is based on expected performance after making a reasonable allowance for unavoidable losses (e.g. Normal Idle Time, Normal Waste/ Scrap/Defectives/Spoilage etc.). It is realistic and attainable standard. Variances from the expected standard indicate real deviations from the attainable performance. • **Normal Standard -** It is a standard which is based on average performance in the past. It is attainable under normal conditions. The main purpose of normal standard is to eliminate variations in the cost arising out of trade cycles. • **Historic Standard -** It is the average standard of past achievement. It may not be adopted as past performances including inefficiencies. However, it is useful for establishing a standard costing system.

Standard Costing	• It is a technique which establishes predetermined estimates of the costs of products and services known as standard costs and then compares these predetermined costs with actual costs as they are incurred. • The difference between the standard cost and actual cost is known as a variance which is analyzed to their causes and points of incidence.
Process of Standard Costing	• **Setting of standards** – The first step is to set standards which are to be achieved for each element of cost. • **Ascertainment of actual cost** – Actual costs are to be ascertained from books of accounts, vouchers etc. for each element of costs. • **Comparison** – Actual costs are to be compared with standard cost to find out the difference between the two known as variance. • **Analysis of variance –** Variances are further investigated to find out the actual reason for their occurrence and for identifying the appropriate actions to be taken for future. • **Disposition of variance –** Variances are disposed off by transferring it to the relevant accounts as per the accounting method adopted.
Advantages of Standard Costing	• **Facilitates Planning –** Standard costing facilitates planning since setting up of standard involves careful analysis and scrutiny of different activities of a business. • **Facilitates effective Delegation of Authority –** Delegation of authority becomes effective since the people concerned know what they have to achieve and by what standard they will be judged. • **Facilitates Cost Control –** Standard costs facilitates cost control by revealing exact degree of efficiency in various operations through comparison of actual figures with standard figures and also by revealing exact causes of deviation of actual figures from standard figures through variance analysis. • **Facilitates Motivation –** Standard costing facilitates motivation through standards which provide incentive and motivation to attain standard output of standard quality. Workers who attain standard output may be rewarded. This increases efficiency and productivity. • **Facilitates Objective Measurement of Performance –** Right person can be rewarded & promoted since performance can be judged objectively. • **Facilitates coordination -** Standard costing facilitates co-ordination between different functions by bringing different functions such as purchasing, production, selling, accounting together while fixing standards. • **Facilitates the formulation of pricing policies –** Standard costing facilitates the formulation of pricing policies for prospective orders.

	• **Facilitates cost reporting –** Standard costing through variance analysis provides a ready means of interpretation of information for the management for the purpose of control and decision making. Ready reporting enhances the value of reports. • **Projection of Profits –** System of standard costing facilitates projections regarding costs for various types of production. The techniques developed for controlling costs also contribute to better management of revenues and making reliable projection regarding profits. • **Facilitates the use of MBE principle –** Standard costing facilitates the used of management by exception (MBE) principle since the management need to concentrated only on the areas and problems which require its attention through study of variance analysis. • **Provides Economical means of Costing –** Standard costing provides economical means of costing in the sense that once the standards have been fixed some records can be kept in quantities only. This eliminates much clerical effort in pricing and balancing items on stock ledger card. The standard cost of goods produced can be calculated immediately just by multiplying the quantity by the unit standard cost. • **Cost consciousness –** Standard costing creates cost consciousness among executives which increases efficiency and productivity.
Limitations of Standard Costing	• **Setting of Accurate Standards –** It is difficult to fix accurate standard costs. Standards may be either too strict or too liberal. Inaccurate and unreliable standards do more harm than benefits. • **Revision of Standards –** Standards require revision because business conditions constantly keep on changing. Revision of standards is costly and some firms ignore it. • **Adverse Effect on Morale & Motivation –** Non-achievement of unrealistic standards may have an adverse effect on the morale and motivation of the employees. • **Duplication –** Where the system has not yet been fully accepted, there is duplication in recording in as much as inventory pricing etc. have to be done both at standard and actual price. • **Expensive –** In case of small concerns it is expensive to operate standard costing system. • **Non facilitate cost reduction –** Standard costing facilitates only cost control and not cost reduction. • **Unsuitability –** Standard Costing system is costly and unsuitable in job-order industries where the production is of non-repetitive nature. • **Difficulty in setting standards –** Sometimes it becomes difficult to set up standard costs in view of the uncertain economic conditions, great fluctuations in prices.

Setting of standard cost	• Extreme care is required to be taken in the establishment of standards because the success of standard cost system depends on the accuracy and reliability of these standards. • For setting standards, routines and process of working conditions are thoroughly studied. • Work studies and motion studies are conducted and different tests are carried out to ensure that standards are realistic and conform to management's view of efficient operations and relevant expenditure.
Standard Hour	• Standard hour is a hypothetical hour which represents the amount of work which should be performed in one hour under stated conditions. • In other words, standard hour is the quantity of output or amount which should be performed in one hour. $\text{Standard Hours} = \frac{\text{Actual Output}}{\text{Standard output per hour}}$
Variance Analysis	• The difference between standard and actual is known as variance. • Variance analysis is the process of analyzing variances by sub-dividing the total variance in such a way that management can assign responsibility for any deviation from standard performance. • Controllable variance is one which is amendable to control by a particular individual or departmental who is responsible for the variance such as excess material usage, etc. • An uncontrollable variance is one which is not amendable to control by a particular individual or departmental head. Such a variance is caused by external factors such as fluctuations in market prices, etc. • Any variance which increases the actual profit is favourable (F) or credit variance. • Any variance which decreases the actual profit is unfavourable (U) or adverse variance.
Types of direct material variances	• Material variances mainly arise due to the efficiency or inefficiency in the use of materials and/or change in actual price and standard price of materials.
Direct Material Cost Variance (MCV)	• It is the difference between the standard cost of direct materials specified for the output achieved and the actual cost of direct materials consumed. • It arises due to change in price of material, or change in quantity of material, or change in price and quantity of material. MCV = Standard material cost for actual output - Actual cost of material consumed = (SQ × SP) – (AQ × AP)
Direct Material Price Variance (MPV)	• It is that portion of the material cost variance which is due to the difference between the standard price specified and the actual price paid. MPV = (Standard price – Actual price) × Actual Quantity

Causes of material price variance (MPV)	• Change in the market prices of materials • Failure to purchase the specified quality, thereby resulting in a different price being paid • Change in the quantity of materials purchased, thereby leading to lower/ higher quantity discount • Not availing cash discounts, when standards set took into account such discounts • Inefficient purchasing • Change in the delivery costs • Rush purchases • Purchase of a substitute material on account of non-availability of the material specified • Change in the rate of excise duty, purchase tax etc. • Off-season purchasing for certain seasonal products like jute, cotton etc.
Direct Material Usage Variance (MUV)	• It is that portion of the material cost variance which is due to the difference between the standard quantity specified and the actual quantity consumed. MUV = (Standard quantity for actual output – Actual quantity) × Standard Price
Causes of material usage variance (MUV)	• Use of non-standard materials • Use of non-standard material mixture • Use of substitute material • Inefficiency in the use of materials • Change in the quality of materials • Change in the design or specification of the product • Change in the method of production • Yield from materials in excess of or less than standard yield • Pilferage • Defect in plant and machinery
Direct Material Mix Variance (MMV)	• It is that portion of the material usage variance which is due to the difference between standard and actual composition of materials. It may arise in industries like chemicals, rubber etc. where a number of raw materials are mixed to produce a final product. MMV = (Revised Standard Quantity – Actual Quantity) × Standard Price where, Revised Standard Quantity (RSQ) = Standard quantity for total actual mix $= \frac{\text{Standard quantity of one material}}{\text{Total standard quantities of all materials}} \times \text{Total actual quantity of one material}$
Causes of material mix variance (MMV)	• It arises only when the actual two or more materials are mixed in a ratio different from the standard material mix ratio. • Change from standard mix may be due to the non-availability of one or more components of material mix.

Direct Material Yield Variance (MYV)	• It is that portion of the material usage variance which is due to the difference between standard yield specified for actual quantity used and actual yield obtained. • It is an output variance which represents a gain or loss on output in terms of finished production. MYV = (Actual Yield – Standard Yield) × Standard output price
Causes of direct material yield variance (MYV)	• Lack of due care in handling • Lack of proper supervision • Defective methods of operation • Improper equipments, tools etc. • Sub-standard quality of materials-fault of purchase department
Labour Variances	• Labour variances mainly arise due to the efficiency or inefficiency in the use of labour hours and/or change in actual rate and standard rate of labour.
Direct Labour Cost Variance (LCV)	• It is the difference between the standard cost of direct labour hours specified for the output achieved and the actual cost of direct labour hours expended. LCV = Standard labour cost of actual output – Actual labour cost = (Standard hours for actual output × Standard rate) – (Actual hours × Actual Rate)
Direct Labour Rate Variance (LRV)	• It is that portion of the labour cost variance which is due to the difference between the standard rate specified and the actual rate paid. LRV = (Standard Rate – Actual Rate) × Actual Hours
Causes for labour rate variances (LRV)	• Change in the basic wage rates • Change in the method of wage payment • Use of grades of labour different from the standard grade specified • Unscheduled overtime • New workers not being paid at full rates
Direct Labour Efficiency Variance (LEV)	• It is that portion of that labour cost variance which is due to the difference between labour hours specified for actual output and the actual labour hours expended. LEV = (Standard hour for actual output – Actual hours) × Standard price
Causes of labour efficiency variance (LEV)	• Use of non-standard grade of workers • Use of standard grade of workers but workers are inefficient • Use of defective method of operation • use of defective or non-standard materials • Use of defective tools and plant and machinery • Poor working conditions e.g. inadequate lighting etc. • Incompetent supervision

Direct Labour Mix Variance (LMV) or Gang Composition Variance	• It is that portion of the labour efficiency variance which is due to the difference between standard and actual composition of labour. LMV = (Revised standard hours – Actual hours) × Standard rate
Direct Labour Yield Variance (LYV)	• It is that portion of the labour efficiency variance which is due to the difference between standard yield specified for actual hours used and actual yield obtained. • It is an output variance which represents a gain or loss on output in terms of finished production. LYV = (Actual Yield – Standard Yield) × Standard labour cost per unit of output
Idle time variance (ITV)	• It is that portion of labour efficiency variance which is due to abnormal idle time such as time lost due to power failure, machinery break-down, strike etc. • It arises due to the difference between actual labour hours worked and actual labour hours paid. ITV = Idle Hours × Standard Rate
Causes for idle time variance	• Break-down of plant and machinery • Sub-optimal condition of equipments • Inappropriate equipment • Poor placement of workers • Delay in giving production instructions • Changes in methods of production • Improper supervision in the factory • Too frequent changes in workers work • Power failure
Overhead Cost Variance (OCV)	• It is the difference between total standard overhead absorbed and total actual overhead incurred. It indicates under or over absorption of overheads. OCV = Absorbed overhead – Actual overhead = (Std. hours × Std. overhead rate) – Actual overhead
Variable Overhead Cost Variance (VOCV)	• It is the difference between absorbed variable overhead and actual variable overhead incurred. • It indicates under or over absorption of variable overheads.
Variable Overhead Expenditure /Spending/Budget Variance (VOBV)	• This variance arises due to the difference between standard variable overhead allowed and actual variable overhead incurred. • It will represent the difference between actual hours worked at standard variable overhead rate and actual variable overhead incurred during the period.

Variable Overhead Efficiency Variance (VOEV)	• It is that portion of total variable overheads cost variance which arises due to the difference between standard hours for actual output (SH) and actual hours (AH). • If actual hours worked are less than standard hours, the VOEV is favourable, and vice-versa. VOEV = (Std. hours for actual output – Actual hours) × Std. variable overhead rate
Fixed Overhead Cost Variance (FOCV)	• It is the difference between total standard fixed overhead absorbed and total actual fixed overhead incurred. • It indicates under or over absorption of fixed overheads. FOCV = Absorbed overhead – Actual overhead = (Std. hours for actual output × standard rate) – Actual overhead
Fixed Overhead Expenditure Variance (FOEV)	• It is that portion of total fixed overhead variance which arises due to the difference between budgeted fixed overhead and actual fixed overheads. It indicates under or over spending of fixed overheads. FOEV = Budgeted fixed overhead – Actual fixed overhead
Causes of fixed overhead expenditure variance	• Seasonal conditions • improper use of available facilities • Use of efficient tools and equipments • Improperly set standards • Rise in price due to inflation • Change in methods of operation
Fixed Overhead Volume Variance (FOVV)	• It is that portion of total fixed overhead cost variance which arises due to the difference between standard hours for actual output and budgeted hours. • Adverse fixed overhead volume variance indicates unabsorbed portion of fixed overheads because of underutilization of capacity. FOVV = (Std. hours for actual output – Budgeted hours) × Std. rate
Causes for fixed overhead volume variance	• Power failure • machine breakdown • Waiting for tools, work, instructions, machine, materials etc. • Idle or excess capacity • Variation in customer's demands and orders booked • Labour strikes or lock-outs etc. • Working overtime due to rush orders etc. • Defective scheduling and routing of production
Fixed Overhead Efficiency Variance (FOEV)	• It is that portion of fixed overhead volume variance which arises due to the difference between standard hours for actual output and actual hours. • It indicates the increased or reduced output arising from efficiency above or below the standard which is expected. FOEV = (Std. hours for actual output – Actual hours) × Std. rate

Causes for fixed overhead efficiency variance	• Poor working conditions • Poor supervision • Poor scheduling of production processes • Frequent power failures • Improperly set standards
Fixed Overhead Capacity Variance (FOCV)	• It is that portion of fixed overhead volume variance which arises due to the difference between actual hours and budgeted hours. It indicates working at higher or lower capacity usage than the standard. FOCV = (Actual hours worked – Budgeted hours) × Std. Rate
Causes for fixed overhead capacity variance	• Chance in scheduling of production process • Power failures • Labour troubles • Lock-out • Shortage of materials • Machine break-down • Slump in customer's demand • Decline in sales volume • Inefficient supervision • Defective material
Fixed Overhead Calendar Variance (FOCV)	• It is that portion of fixed overhead volume variance which arises due to the difference between the actual number of working days and the budgeted number of working days. • In other words, it indicates the difference between revised budgeted fixed overheads and original budgeted fixed overheads. FOCV = (Actual no. of working days – Budgeted no. of working days) × Std. rate = (Revised budgeted hours – Budgeted hours) × Std. rate
Fixed Overhead Revised Capacity Variance (FORCV)	• It is that part of fixed overhead capacity variance which is due to difference between standard fixed overheads for actual hours and fixed overheads for days available during the period at standard rate also called possible overheads. • This variance arises due to the difference between actual hours worked and days actually available during the related period. FORCV = (Actual hours – Revised budgeted hours) × Std. rate
Control Ratios	• Management also makes use of ratios in controlling operations. These ratios are generally known as control ratios. • These are used by the management to find out whether the deviations of actual from budgeted results are favorable or otherwise. • These ratios are expressed in terms of percentages. • If the ratio is 100% or more, the trend is taken as favorable. The indication is taken as unfavorable if the ratio is less than 100%.

Efficiency Ratio	• It is defined as "the standard hours equivalent to the work produced expressed as a percentage of actual hours spent in production". • Thus, this ratio shows whether actual time taken in production is more or less than the time allowed by the standard. • It can be related to Overhead Efficiency Variance or Labour Efficiency Variance. $\text{Efficiency Ratio}=\frac{\text{Standard hours for actual output}(\text{SH})}{\text{Actual hours worked}(\text{AH})}\times 100$
Activity Ratio or Production Volume Ratio	• It is defined as "the standard hours equivalent to the work produced, expressed as percentage of budgeted standard hours". • Thus this ratio shows the extent to which the production facilities have been utilized as compared with that contemplated in budgets. • It can be related to Fixed Overhead Volume Variance. $\text{Activity Ratio}=\frac{\text{Standard hours for actual output}(\text{SH})}{\text{Budgeted hours}(\text{BH})}\times 100$
Capacity Ratio	• It expresses actual hours worked as a percentage of the budgeted hours. • It indicates whether and to what extent budgeted hours of activity are actually utilized. • It can be related to Fixed Overhead Capacity Variance. $\text{Capacity Ratio}=\frac{\text{Actual hours worked}(\text{AH})}{\text{Budgeted hours}(\text{BH})}\times 100=\frac{\text{Activity Ratio}}{\text{Efficiency Ratio}}$
Calendar Ratio	• This ratio refers to the relationship between actual number of days worked during the budget period and the budgeted number of working days in the budgeted period. • It indicates the extent of actual working days availed during the budget period. • It can be related to Fixed Overhead Calendar variance. $\text{Calendar Ratio}=\frac{\text{Actual number of working days in the budgeted period}}{\text{Budgeted number of working days in the budgeted peirod}}\times 100$
Idle Capacity Ratio	• It indicates the percentage of budgeted capacity which is not actually utilized during the budget period. $\text{Idle Capacity Ratio}=\frac{\text{Budgeted Capacity - Actual Capacity}}{\text{Budgeted Capacity}}\times 100$

PRACTICAL QUESTIONS

1. A manufacturing concern which has adopted standard costing furnishes the following information: **[SM]**

Standard:	Material for 70 kg of finished products	100 kg
	Price of material	₹1 per kg
Actual:	Output	2,10,000 kg
	Material used	2,80,000 kg
	Cost of materials	₹2,52,000

Calculate:

(a) Material usage variance,

(b) Material price variance

(c) Material cost variance

Ans. (a) ₹20,000 (F); (b) ₹28,000 (F); (c) ₹48,000 (F).

2. For making 10 kg of SK, the standard material requirement is: **[SM]**

Material	Quantity (Kg)	Rate per kg (₹)
A	8	6.00
B	4	4.00

During April, 1,000 kg of SK were produced. The actual consumption of materials is as under:

Material	Quantity (Kg)	Rate per kg (₹)
A	750	7.00
B	500	5.00

Calculate: (a) Material cost variance: (b) Material price variance: (c) Material usage variance

Ans. (a) ₹1,350 (A); (b) ₹1,250 (A); (c) ₹100 (A).

3. EML operates in coal mining through open cast mining method. Explosives and detonators are used for excavation of coal from the mines. The following are the details of standard quantity of explosives materials used for mining: **[RTP may 2024]**

Particulars	Rate (₹)	Standard Qty. for Iron ore	Standard Qty. for Over-burden (OB)
SME	40.00 per kg.	2.4 kg per tonne	1.9 kg per cubic- meter
Detonators	20.00 per piece	2 pcs per tonne	2 pcs per cubic- meter

The standard stripping ratio is 3:1 (means 3 cubic- meter of overburden soil to be removed to get one tonne of coal).

During the month of December 2023, the company produces 20,000 tonnes of coal and 58,000 cubic- meter of OB. The quantity of explosive materials used and paid for the month is as below:

Material	Quantity	Amount (₹)
SME	1,67,200 kg.	63,53,600
Detonators	1,18,400 pcs	24,27,200

Explosive suppliers are paid for the explosive materials on the basis of performance of the explosives which is termed as powder factor. One of the suppliers has presented their bill for explosive supplied for the month of December 2023. You being a bill passing officer of EML is required to COMPUTE the material price variance, material quantity variance and material cost variance.

Sol. MPV = 12,75,200 (F); MUV = ₹3,92,000 (F); MCV = ₹6,67,200 (F)]

4. The standard cost of a chemical mixture is as follows: **[RTP May 2024]**

40% of material A at ₹20 per kg

60% of material B at ₹30 per kg

A standard loss of 10% of input is expected in production. The cost records for a period showed the following usage:

90 kg material A at a cost of ₹18 per kg

110 kg material B at a cost of ₹34 per kg

The quantity produced was 182 kg of good product.

Calculate all material variances.

Ans. MCV = ₹102.20 (A); MPV = ₹260 (A); MUV = ₹157.70 (F); MMV = ₹100 (F); MYV = ₹57.70 (F).

5. SK Ltd. manufactures SK by mixing three raw materials. For each batch of 100 kg of SK, 125 kg of raw material are used. In June 60 batches are prepared to produce an output of 5600 kg of SK. The standard and actual particulars for June are as follows: **[SM]**

Raw materials	Standard		Actual		Quantity of raw material purchased
	Mix %	Price per kg (₹)	Mix %	Price per kg (₹)	
X	50	20	60	21	5000
Y	30	10	20	8	2000
Z	20	5	20	6	1200

Calculate all variances.

Ans. MCV = ₹17,500 (A); MPV = ₹3,000 (A); MUV = ₹14,500 (A); MMV = ₹7,500 (A); MYV = ₹7,000 (A).

6. SK Ltd. produces an article by blending two basic raw materials. The following standards have been set up for raw materials: **[SM]**

Materials	Standard Mix	Standard Price per kg
A	40%	₹5.00
B	60%	₹4.00

The standard loss in processing is 10%. During March, the company produced 2,250 kg of finished output. The position of stock and purchases for the month of March, is as under:

Materials	Stock on 1 March	Stock on 31 March	Purchase during March
A	40 kg	20 kg	800 kg for ₹4,800
B	50 kg	15 kg	1800 kg for ₹7,560

Calculate the following variances:

(a) Material price variance
(b) Material usage variance;
(c) Material yield variance
(d) Material mix variance
(e) Material cost variance.

Assume FIFO method for issue of material. The opening stock is to be valued at standard price.

Ans. (a) ₹1,137 (A); (b) ₹440 (A); (c) ₹682 (A); (d) ₹242 (F); (e) ₹1,577 (A).

7. One kilogram of product K requires two chemicals A and B. The following were the details of product K for the month of June: **[SM]**

(i) Standard mix for chemical A is 50% and chemical B is 50%.
(ii) Standard price kilogram of chemical A is ₹12 and chemical B is ₹15.
(iii) Actual input of chemical B is 70 kilograms.
(iv) Actual price per kilogram of chemical A is ₹15
(v) Standard normal loss is 10% of total input
(vi) Total material cost variance is ₹650 adverse
(vii) Total material yield variance is ₹135 adverse.

You are required to calculate:

(i) Total material mix variance
(ii) Total material usage variance
(iii) Total material price variance
(iv) Actual loss of actual input
(v) Actual input of chemical A
(vi) Actual price per kg of chemical B

Ans. (i) ₹45 (A); (ii) ₹180 (A); (iii) ₹470 (A); (iv) 20 kg; (v) 40 kg; (vi)₹20.

8. Compute the missing data indicated by the question marks from the following:

Particulars	A	B
Standard Price/Unit	₹12	₹15
Actual price/unit	₹15	₹20
Standard Input (kg)	50	?
Actual Input (kg)	?	70

Material Price variance	?	?
Material Usage variance	?	₹300 (A)
Material Cost variance	?	?

Material mix variance for both products together was ₹45 adverse

9. SK Limited operates a system of standard costing in respect of one of its products which is manufactured within a single cost centre. Following are the details: **[SM]**

Budgeted data:

Material	Quantity	Price (₹)	Amount (₹)
A	60	20	1200
B	40	30	1200
Inputs	100		2400
Normal loss	20		.
Output	80		2400

Actual Data:

Actual output 80 units

Material	Quantity	Price (₹)	Amount(₹)
A	70	?	?
B	?	30	?

Material Price Variance ₹105 (A)
Material Cost Variance ₹275 (A)

You are required to calculate:

(a) Actual price of material A
(b) Actual quantity of material B
(c) Material price variance
(d) Material usage variance
(e) Material mix variance
(f) Material sub usage variance

Ans. (a) ₹21.50; (b) 39 units; (c) ₹105 (A); (d) ₹170 (A); (e) ₹46 (F); (f) ₹216 (A).

10. The details regarding the composition and the weekly wage rates of labour force engaged on a job scheduled to be completed in 30 weeks are as follows:

Category of workers	Standard		Actual	
	No. of workers	Weekly wage rate per worker	No. of workers	Weekly wage rate per worker
Skilled	75	₹60	70	₹70
Semi-skilled	45	₹40	30	₹50
Unskilled	60	₹30	80	₹20

The work is actually completed in 32 weeks. Calculate the all labour variances.

Ans. LCV = ₹13,000 (A); LRV = ₹6,400 (A); LEV = ₹6,600 (A); LMV = ₹9,600 (F); LYV = ₹16,200 (A).

11. The standard labour component and the actual labour component engaged in a week for a job are as under:

		Skilled workers	Semi-skilled workers	Unskilled workers
(a)	Standard No. of workers in the gang	32	12	6
(b)	Standard wage rate per hour (₹)	3	2	1
(c)	Actual no. Of workers employed in the gang during the week	28	18	4
(d)	Actual wage rate per hour (₹)	4	3	2

During the 40-hour working week, the gang produced 1,800 standard labour hours of work. Calculate the different labour variance.

Ans. LCV = ₹2,424 (A); LRV = ₹2,000 (A); LEV = ₹424 (A); LMV = ₹80 (F); LYV = ₹504 (A).

12. The following standards have been set to manufacture a product of SK Ltd.: **[SM]**

Direct Material:	(₹)
2 units of A @ ₹4 per unit	8.00
3 units of B @ ₹3 per unit	9.00
15 units of C @ ₹1 per unit	15.00
	32.00
Direct labour: 3 hours @ ₹8 per hour	24.00
Total standard prime cost	56.00

The company manufactured and sold 6,000 units of the product during the year. Direct material costs were as follows:

12,500 units of A at ₹4.40 per unit

18,000 units of B at ₹2.80 per unit

88,500 units of C at ₹1.20 per unit

The company worked 17,500 direct labour hours during the year. For 2,500 of these hours, the company paid at ₹12 per hour while for the remaining, the wages were paid at standard rate. Calculate materials price variance and usage variance and labour rate and efficiency variances.

Ans. MPV = ₹19,100 (A); MUV = ₹500 (A); LRV = ₹10,000 (A); LEV = ₹4,000 (F).

13. The standard output of 'S' is 25 units per hour in a manufacturing department of a company employing 100 workers. The standard wage rate per labour hour is ₹6.

[SM, Similar May 2022, Similar July 2021]

In a 42 hour week, the department produced, 1,040 units of 'S' despite 5% of the time paid was lost due to abnormal reasons. The hourly rate actually paid were ₹6.20, ₹6 and ₹5.70 respectively to 10, 30 and 60 workers. Compute relevant variances.

Ans. LCV = ₹432 (F); LRV = ₹672 (F); LEV = ₹1,020 (F); Idle time var. = ₹1,260 (A).

14. From the particulars given below, compute:

(a) Material price variance

(b) Material usage variance

(c) Labour rate variance

(d) Idle time variance and

(e) Labour efficiency variance with full working details.

One tonne of materials input yields a standard output of 1,00,000 units. The standard price of material is ₹20 per kg. Number of employees engaged is 200. The standard wage rate per employee per day is ₹6. The standard daily output per employee is 100 units. The actual quantity of material used is 10 tonnes and the actual price paid is ₹21 per kg. Actual output obtained is 9,00,000 units. Actual number of days worked is 50 and actual rate of wages paid is ₹6.50 per day. Idle time paid for and included in above time is ½ day.

Ans. (a) ₹10,000 (A); (b) ₹20,000 (A); (c) ₹5,000 (A); (d) ₹600 (A); (e) ₹5,400 (A).

15. SK Ltd. had prepared the following estimation for the month of April: **[RTP May 2020]**

	Quantity	Rate (₹)	Amount (₹)
Material – A	800 kg	45.00	36,000
Material – B	600 kg	30.00	18,000
Skilled Labour	1,000 hours	37.50	37,500
Unskilled Labour	800 hours	22.00	17,600

Normal loss was expected to be 10% of total input materials and an idle labour time of 5% of expected labour hours was also estimated.

At the end of the month the following information has been collected from the cost accounting department:

The company has produced 1,480 kg finished product by using the followings:

	Quantity	Rate (₹)	Amount (₹)
Material – A	900 kg	43.00	38,700
Material – B	650 kg	32.50	21,125
Skilled Labour	1,200 hours	35.50	42,600
Unskilled Labour	860 hours	23.00	19,780

You are required to calculate:

(a) Material cost variance
(b) Material price variance
(c) Material mix variance
(d) Material yield variance
(e) Labour cost variance
(f) Labour efficiency variance
(g) Labour yield variance

Ans. (a) ₹3,580 (F); (b) ₹175 (F); (c) ₹210 (A); (d) ₹3,615 (F); (e) ₹921 (A); (f) ₹2,462 (A); (g) ₹1,594 (A).

16. From the following information of SK Ltd.

calculate

(a) Variable overhead cost variance

(b) Variable overhead expenditure variance and

(c) Variable overhead efficiency variance

Budgeted production	6,000 units
Budgeted variable overhead	₹1,20,000
Standard time for one unit of output	2 hours
Actual production	5,900 units
Actual overhead incurred	₹1,22,000
Actual hours worked	11,600 hours

Ans. (a) ₹4,000 (A); (b) ₹6,000 (A); (c) ₹2,000 (F).

17. SK Ltd. uses standard costing system in manufacturing of its product 'Mask'. The details are as follows: **[SM]**

Direct material	0.50 meter @ ₹60 per meter	₹30
Direct labour	1 hour @ ₹20 per hour	₹20
Variable overhead	1 hour @ ₹10 per hour	₹10
Total		₹60

During the month of August, 10,000 units of 'Mask' were manufactured. Details are as follows:

Direct material consumed	5700 meters @ ₹58 per meter		
Direct labour hours	?	@ ?	₹2,24,400
Variable overhead incurred			₹1,12,200

Variable overhead efficiency variance is ₹2,000 (A).

Variable overheads are based on direct labour hours

You are required to calculate the missing data and all the relevant variances.

Ans. MCV = ₹30,600 (A); MPV = ₹11,400 (F); MUV = ₹42,000 (A); VOCV = ₹12,200 (A); VO exp. = ₹10,200 (A); LCV = ₹24,400 (A); LRV = ₹20,400 (A); LEV = ₹4,000 (A)]

18. The cost details of SK Ltd. for the month of August is as follows: **[SM]**

	Budgeted	Actual
Fixed overheads	₹15,00,000	₹15,60,000
Units of production	7,500	7,800
Standard time for one unit	2 hours	-
Actual hours worked	-	16,000 hours

Required to calculate:

(a) Fixed overhead cost variance

(b) Fixed overhead expenditure variance

(c) Fixed overhead volume variance

(d) Fixed overhead efficiency variance and

(e) Fixed overhead capacity variance.

Ans. (a) Nil; (b) ₹60,000 (A); (c) ₹60,000 (F); (d) ₹40,000 (A); (e) ₹1,00,000 (F).

19. A company has a normal capacity of 120 machines, working 8 hours per day of 25 days in a month. The fixed overheads are budgeted at ₹1,44,000 per month. The standard time required to manufacture one unit of product is 4 hours. **[SM]**

In April, the company worked 24 days of 840 machine hours per day and produced 5,305 units of output. The actual fixed overheads were ₹1,42,000.

Compute:

(a) Efficiency variance

(b) Capacity variance

(c) Calendar variance

(d) Expense variance

(e) Volume variance,

(f) Total fixed overhead variance.

Ans. (a) ₹6,360 (F); (b) ₹17,280 (A); (c) ₹5,760 (A); (d) ₹2,000 (F); (e) ₹16,680 (A); (f) ₹14,680 (A).

20. The following information was obtained from the records of a manufacturing unit using standard costing system.

	Standard	Actual
Production	4,000 units	3,800 units
Working days	20	21
Machine hours	8,000 hours	7,800 hours
Fixed Overhead	₹4,00,000	₹3,90,000
Variable Overhead	₹1,20,000	₹1,20,000

You are required to calculate the following variance:

(a) Variable overhead variances

(b) Fixed overhead variances

Ans. (a) ₹6,000 (A); ₹3,000 (A); ₹3,000 (A); (b) ₹10,000 (A); ₹10,000 (F); ₹20,000 (A); ₹10,000 (A); ₹30,000 (A); ₹20,000 (F).

21. The following data has been collected from the cost records of a unit for computing the various fixed overhead variances for a period: **[SM]**

Number of budgeted working days	25
Budgeted man-hours per day	6,000

Output (budgeted) per man-hour (in units)	1
Fixed overhead cost as budgeted	₹1,50,000
Actual number of working days	27
Actual man-hours per day	6,300
Actual output per man-hour (in units)	0.90
Actual fixed overhead incurred	₹1,56,000

Calculate fixed overhead variances:

(i) Expenditure variance

(ii) Volume variance

(iii) Fixed cost variance

Ans. (i) ₹6,000 (A); (ii) ₹3,090 (F); (iii) ₹2,910 (A).

22. In a manufacturing company the standard units of production for the year were fixed at 1,20,000 units and overhead expenditures were estimated to be as follows: **[Dec 2021]**

Particulars	Amount (₹)
Fixed	12,00,000
Semi-variable (60% expenses are of fixed nature and 40% are of variable nature)	1,80,000
Variable	6,00,000

Actual production during the month of April, 2021 was 8,000 units. Each month has 20 working days. During the month there was one public holiday. The actual overheads were as follows:

Particulars	Amount (₹)
Fixed	1,10,000
Semi-variable (60% expenses are of fixed nature and 40% are of variable nature)	19,200
Variable	48,000

You are required to calculate the following variances for the month of April 2021:

(i) Overhead cost variance

(ii) Fixed overhead cost variance

(iii) Variable overhead cost variance

(iv) Fixed overhead volume variance

(v) Fixed overhead expenditure variance

(vi) Calendar variance

Ans. (i) ₹45,200 (A); (ii) ₹34,320 (A); (iii) ₹10,880 (A); (iv) ₹21,800 (A); (v) ₹12,520 (A); (vi) ₹5,450 (A).

23. The overhead expense budget for a factory producing to a capacity of 200 units per month is as follows: **[SM]**

Description of overhead	Fixed cost per unit in ₹	Variable cost per unit in ₹	Total cost per unit in ₹
Power and fuel	1,000	500	1,500
Repair & maintenance	500	250	750
Printing and stationary	500	250	750
Other overheads	1,000	500	1,500
	3,000	1,500	4,500

The factory has actually produced only 100 units in a particular month. Details of overheads actually incurred have been provided by the accounts department and are as follows:

Description of overhead	Actual Cost (₹)
Power and fuel	4,00,000
Repair & maintenance	2,00,000
Printing and stationary	1,75,000
Other overheads	3,75,000

You are required to calculate the overhead volume variance and the overhead expense variance.

Ans. Volume = ₹3,00,000 (A); Expense = ₹4,00,000 (A)

24. ABC Ltd. has furnished the following information regarding the overheads for the month of June 2020: **[Nov 2020]**

(i) Fixed overhead cost variance ₹2,800 (Adverse)
(ii) Fixed overhead volume variance ₹2,000 (Adverse)
(iii) Budgeted Hours for June, 2020 2,400 hours
(iv) Budgeted Overheads for June, 2020 ₹12,000
(v) Actual rate of recovery of overheads ₹8 per hour

From the above given information calculate:

(1) Fixed overhead expenditure variance
(2) Actual overheads incurred
(3) Actual hours for actual production
(4) Fixed overhead capacity variance
(5) Standard hours for actual production
(6) Fixed overhead efficiency variance

Ans. (1) ₹800 (A); (2) ₹12,800; (3) 1,600 hours; (4) ₹4,000 (A); (5) 2,000 hours; (6) ₹2,000 (F).

25. Following data is available for ABC Ltd.: **[May 2019]**

Standard working hours	8 hours per day of 5 days per week
Maximum capacity	60 employees
Actual working	50 employees
Actual hours expected to be worked per four week	8,000 hours
Standard hours expected to be earned per four week	9,600 hours
Actual hours worked in the four week period	7,500 hours
Standard hours earned in the four week period	8,800 hours

The related period is of four weeks. Calculate the following Ratios:

(i) Efficiency ratio
(ii) Activity ratio
(iii) Standard capacity usage ratio
(iv) Actual capacity usage ratio
(v) Actual usage of Budgeted capacity ratio

Ans. (i) 117.33%; (ii) 110%; (iii) 83.33%; (iv) 78.125%; (v) 93.75%

26. NC Limited uses a standard costing system for the manufacturing of its product 'X'. the following information is available for the last week of the month: **[May 2023]**

- 25,000 kg of raw material were actually purchased for ₹3,12,500. The expected output is 8 units of product 'X' from each one kg of raw material. There is no opening and closing inventories. The material price variance and material cost variance, as per cost records, are ₹12,500 (F) and ₹1,800 (A) respectively.
- The standard time to produce a batch of 10 units of product 'X' is 15 minutes. The standard wage rate per labour hour is 50. The company employs 125 workers in two categories, skilled and semi-skilled, in a ratio of 60:40. The hourly wages actually paid were ₹50 per hour for skilled workers and ₹40 per hour for semi-skilled workers. The weekly working hours are 40 hours per worker. Standard wage rate is the same for skilled and semi-skilled workers.
- The monthly fixed overheads are budgeted at ₹76,480. Overheads are evenly distributed throughout the month and assume 4 weeks in a month. In the last week of the month, the actual fixed overhead expenses were ₹19,500.

Required:

(a) Calculate the standard price per kg and the standard quantity of raw material
(b) Calculate the material usage variance, labour cost variance and labour efficiency variance.
(c) Calculate the fixed overhead cost variance, the fixed overhead expenditure variance and the fixed overhead volume variance.

Ans. (a) ₹13; 23,900 kg; (b) ₹14,300 (A); ₹9,000 (F); ₹11,000 (A); (c) ₹1,221 (A); ₹380 (A); ₹841 (A).

PRACTICE QUESTIONS

27. The standard and actual figures of product 'Z' are as under: **[SM]**

	Standard	**Actual**
Material quantity	50 units	45 units
Material price per unit	₹1.00	₹0.80

Calculate material cost variances.

Ans. MCV = ₹14 (F); MPV = ₹9 (F); MUV = ₹5 (F)

28. The standard mix to produce one unit of a product is as follows: **[SM]**

Material X	60 units @ ₹15 per unit	=	900
Material Y	80 units @ ₹20 per unit	=	1,600
Material Z	100 units @ ₹25 per unit	=	2,500
	240 units		5,000

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

Material X	640 units @ ₹17.50 per unit	=	11,200
Material Y	950 units @ ₹18.00 per unit	=	17,100
Material Z	870 units @ ₹27.50 per unit	=	23,925
	2,460 units		52,225

Calculate all material variances.

Ans. MCV = ₹2,225 (A); MPV = ₹1,875 (A); MUV = ₹350 (A); MMV = ₹900 (F); MYV = ₹1,250 (A).

29. Following data is extracted from the books of SK Ltd. for the month of January: **[SM]**

(i) Estimation-

Particulars	Quantity (kg)	Price (₹)	Amount (₹)
Material – A	800	?	--
Material – B	600	30.00	18,000
			--

Normal loss was expected to be 10% of total input materials.

(ii) Actuals-

1,480 kgs of output produced.

Particulars	Quantity (kg)	Price (₹)	Amount (₹)
Material – A	900	?	--
Material – B	?	32.50	--
			59,825

(iii) Other information-

Material cost variance = ₹3,625 (F)

Material price variance = ₹175 (F)

You are required to calculate:

(i) Standard price of material - A

(ii) Actual quantity of material – B

(iii) Actual price of material – A

(iv) Revised standard quantity of material – A and material – B

(v) Material mix variance

Ans. (i) ₹45; (ii) 650 kg; (iii) ₹43; (iv) 886 kg; 664 kg; (v) ₹210 (A).

30. Following are the details of the product SK for the month of April:

Standard quantity of material required per unit 5kg

Actual output 1,000 units

Actual cost of materials used ₹7,14,000

Material price variance ₹51,000 (Fav)

Actual price per kg of material is found to be less then standard price per kg of material by ₹10

You are required to calculate:

(a) Actual quantity and Actual price of materials used.

(b) Material Usage Variance

(c) Material Cost Variance

Ans. (a) ₹140; (b) ₹15,000 (A); (c) ₹36,000 (F)

31. The standard and actual figures of a firm are as under: **[SM]**

Standard time for the job	1,000 hours
Standard rate per hour	₹50
Actual time taken	900 hours
Actual wages paid	₹36,000

Calculate variances.

Ans. LCV = ₹14,000 (F); LRV = ₹9,000 (F); LEV = ₹5,000 (F).

32. The standard labour employment and the actual labour engaged in a 40 hours week for a job are as under:

Category	Standard		Actual	
	No. of workers	Wage rate per hour (₹)	No. of workers	Wage rate per hour (₹)
Skilled	65	45	50	50
Semi-skilled	20	30	30	35
Unskilled	15	15	20	10

Standard output: 2000 units; Actual output: 1800 units

Abnormal idle time 2 hours in the week

Calculate:

(a) Labour cost variance (b) Labour efficiency variance

(c) Labour idle time variance

Ans. (a) ₹15,000 (A); (b) ₹3,900 (F); (c) ₹6,900 (A).

33. SK ltd. uses standard costing system for manufacturing of its product X. Following is the budget data given in relation to labour hours for manufacture of 1 unit of Product X: **[SM]**

Labour	Hours	Rate (₹)
Skilled	2	6
Semi-Skilled	3	4
Unskilled	5	3
Total	10	

In the month of January, total 10,000 units were produced following are the details:

Labour	Hours	Rate (₹)	Amount (₹)
Skilled	18,000	7	1,26,000
Semi-Skilled	33,000	3.50	1,15,500
Unskilled	58,000	4	2,32,000
Total	1,09,000		4,73,500

Actual idle hours (abnormal) during the month:

Skilled	500
Semi-skilled	700
Unskilled	800
Total	2,000

Calculate:

(a) Labour variances

(b) Also show the effect on labour rate variance if 5,000 hours of skilled labour are paid @₹5.50 per hour and the balance were paid @₹7 per hour.

Ans. (a) LCV = ₹83,500 (A); LRV = ₹59,500 (A); LEV = ₹15,800 (A); Idle time var. = ₹8,200 (A); LMV = ₹11,500 (F); LYV = ₹27,300 (A); (b) LRV = ₹52,000 (A).

34. A gang of workers normally consists of 30 skilled workers, 15 semi-skilled workers and 10 unskilled workers. They are paid at standard rate per hour as under: **[May 2019]**

Skilled	₹70
Semi-skilled	₹65
Unskilled	₹50

In a normal working week of 40 hours, the gang is expected to produce 2,000 units of output. During the week ended 31st March, 2019, the gang consisted of 40 skilled, 10 semi-skilled and 5 unskilled workers. The acutal wages paid were at the rate of ₹75, ₹60 and ₹52 per hour respectively. Four hours were lost due to machine breakdown and 1,600 units were produced.

Calculate the following variances showing clearly adverse (A) or favorable (F)

(i) Labour Cost Variance
(ii) Labour Rate Variance
(iii) Labour Efficiency Variance
(iv) Labour Mix Variance
(v) Labour Idle Time variance

Ans. (i) ₹40,000 (A); (ii) ₹6,400 (A); (iii) ₹18,800 (A); (iv) ₹4,500 (A); (v) ₹14,800 (A).

35. The following information has been provided by a company: **[RTP Nov 23]**

Number of units produced and sold	6,000
Standard labour rate per hour	₹8
Standard hours required for 6,000 units	-
Actual hours required	17,094 hours
Labour efficiency	105.3%
Labour rate variance	₹68,376 (A)

You are required to calculate:

(a) Actual labour rate per hour
(b) Standard hours required for 6,000 units
(c) Labour Efficiency variance
(d) Standard labour cost per unit
(e) Actual labour cost per unit.

Ans. (a) ₹12; (b) ₹18,000 hours; (c) ₹7,248 (F); (d) ₹24; (e) ₹34,19.

36. The following information is available from the cost records of SK Ltd. for the month of March: **[SM]**

Materials purchased	20,000 units @ ₹88,000
Materials consumed	19,000 units
Actual wages paid for 4,950 hours	₹24,750
Units produced	1,800 units
Standard rates and pieces are:	
Direct material	₹4 per unit
Standard output	10 number for one unit
Direct labour rate	₹4.00 per hour
Standard requirement	2.5 hours per unit

You are required to calculate relevant material and labour variance for the month.

Ans. MCV = ₹11,600 (A); MPV = ₹7,600 (A); MUV = ₹4,000 (A); LCV = ₹6,750 (A); LRV = ₹4,950 (A); LEV = ₹1,800 (A).

37. JVG Ltd. produces a product and operates a standard costing system and value material and finished goods inventories at standard cost. The information related with the product is as follows:

[RTP Nov 2019]

Particulars	Cost per unit (₹)
Direct materials (30 kg at ₹350 per kg)	10,500
Direct labour (5 hours at ₹80 per hour)	400

The actual information for the month just ended is as follows:

(a) The budgeted and actual production for the month of September 2019 is 1,000 units.

(b) Direct materials – 5,000 kg at the beginning of the month. The closing balance of direct materials for the month was 10,000 kg. Purchases during the month were made at ₹365 per kg. The actual utilization of direct materials was 7,200 kg more than the budgeted quantity.

(c) Direct labour – 5,300 hours were utilized at a cost of ₹4,34,600

Required:

Calculate

(i) Direct material price and usage variances

(ii) Direct labour rate and efficiency variances.

Ans. (i) ₹5,58,000 (A); ₹25,20,000 (A); (ii) ₹10,600 (A); ₹24,000 (A).

38. The following data for SK ltd. is given: **[SM]**

	Budget	Actual
Production (in units)	400	360
Man hours to produce above	8,000	7,000
Variable overheads (in ₹)	10,000	9,150

The standard time to produce one unit of the product is 20 hours. Calculate relevant variable overhead variances.

Ans. ₹150 (A); ₹400 (A); ₹250 (F).

39. SK company has established the following standards for factory overheads. **[SM]**

Variable overhead per unit	₹10
Fixed overheads per month	₹1,00,000
Capacity of the plant 20,000 units per month.	

The actual data for the month are as follows:

Actual overheads incurred	₹3,00,000
Actual output (units)	15,000 units

Required to calculate:

(i) Production volume variance

(ii) Overhead expense variance.

Ans. (i) ₹25,000 (A); (ii) ₹50,000 (A).

39 .SK Ltd. has furnished the following data: **[SM]**

	Budget	Actual (for the month of July)
No. of working days	25	27
Production in units	20,000	22,000
Fixed overheads	₹30,000	₹31,000

Budgeted fixed overhead rate is ₹1.00 per hour. In July, the actual hours worked were 31,500.

Calculate the following variances:

(i) Volume variance

(ii) Expenditure variance

(iii) Total overhead variance

Ans. (i) ₹3,000 (F); (ii) ₹1,000 (A); (iii) ₹2,000 (F).

40. SK Ltd. has furnished you the following information for the month of August: **[SM]**

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

Calculate overhead variances.

41. Premier Industries has a small factory where 52 workers are employed on an average for 25 days a month and they work 8 hours per day. The normal down time is 15%. The firm has introduced standard costing for cost control. Its monthly budget for November, 2020 shows that the budgeted variable and fixed overhead are ₹1,06,080 and ₹2,21,000 respectively. **[Jan 2021]**

The firm reports the following details of actual performance for November, 2020 after the end of the month:

Actual hours worked	8,100 hrs.
Actual production expressed in standard hours	8,800 hrs.
Actual Variable Overheads	₹1,02,000
Actual Fixed Overheads	₹2,00,000

You are required to calculate:

(i) Variable Overhead Variances:

  (a) Variable overhead expenditure variance

  (b) Variable overhead efficiency variance

(ii) Fixed Overhead Variances:

  (a) Fixed overhead budget variance

  (b) Fixed overhead capacity variance

(c) Fixed overhead efficiency variance

(iii) Control Ratios:

(a) Capacity ratio

(b) Efficiency ratio

(c) Activity ratio

Ans. (i) (a) ₹4,800 (A); (b) ₹8,400 (F); (ii) (a) ₹21,000 (F); (b) ₹18,500 (A); (c) ₹17,500 (F); (iii) (a) 91,63%; (b) 108.64%; (c) 99.54%.

42. Following are the standard cost for a product-X: **[RTP Nov 2020]**

	(₹)
Direct materials 10 kg @ ₹90 per kg	900
Direct labour 8 hours @ ₹100 per hour	800
Variable Overhead 8 hours @ ₹15 per hour	120
Fixed Overhead	400
	2,220

Budgeted output for the year was 2,000 units. Actual output is 1,800 units.

Actual cost for year is as follows:

	(₹)
Direct materials 17,800 kg @ ₹92 per kg	16,37,600
Direct labour 14,000 hours @ ₹104 per hour	14,56,000
Variable overhead incurred	2,17,500
Fixed overhead incurred	7,68,000

You are required to Calculate:

(i) Material Usage Variance

(ii) Material Price Variance

(iii) Material Cost Variance

(iv) Labour Efficiency Variance

(v) Labour Rate Variance

(vi) Labour Cost Variance

(vii) Variable Overhead Cost Variance

(viii) Fixed Overhead Cost Variance

Ans. (i) ₹18,000 (F); (ii) ₹35,600 (A); (iii) ₹17,600 (A); (iv) ₹40,000 (F); (v) ₹56,000 (A); (vi) ₹16,000 (A); (vii) ₹1,500 (A); (viii) ₹48,000 (A).

43. Sara Ltd. has furnished the following standard cost data per' unit of production:

Material 15 kg @ ₹15 per kg.

Labour 6 hours @ ₹5 per hour

Variable overhead 6 hours @ ₹12 per hour.

Fixed overhead ₹4,50,000 per month (Based on a normal volume of

30,000 labour hours.)
The actual cost data for the month of August 2023 are as follows:
Material used 65,000 kg at a cost of ₹9,85,000.
Labour paid ₹1,40,000 for 31,500 hours worked.
Variable overheads ₹3,60,200
Fixed overheads ₹4,70,000
Actual production 4,800 units.
Calculate:
(i) Material Cost Variance.
(ii) Labour Cost Variance.
(iii) Fixed Overhead Cost Variance.
(iv) Variable Overhead Cost Variance

Ans. (i) ₹95,000 (F); (ii) ₹4,000 (F); (iii) ₹38,000 (A); (iv) ₹14,600 (A)

44. Ahaan Limited operates a system of standard costing in respect of one of its products 'AH1' which is manufactures within a single cost centre. Details of standard per unit are as follows:

[RTP Nov 2022]

- The standard material input is 20 kilograms at a standard price of ₹24 per kilogram.
- The standard wage rate is ₹72 per hour and 5 hours are allowed to produced one unit.
- Fixed production overhead is absorbed at the rate of 100% of wages cost.

During the month of April 2022, the following was incurred:

- Actual price paid for material purchased @ ₹22 per kilogram
- Total direct wages cost was ₹43,92,000
- Fixed production overhead cost incurred was ₹45,00,000

Analysis of variances was as follows:

Variances	Favorable	Adverse
Direct material price	₹4,80,000	-
Direct material usage	₹48,000	-
Direct labour rate	-	₹69,120
Direct labour efficiency	₹33,120	-
Fixed production overhead expenditure	-	₹1,80,000

You are required to calculate the following for the month of April, 2022:

(a) Material cost variance
(b) Budgeted output (in units)
(c) Quantity of raw materials purchased (in kilograms)
(d) Actual output (in units)
(e) Actual hours worked

(f) Actual wage rate per labour hour

(g) Labour cost variance

(h) Production overhead cost variance

Ans. (a) ₹5,28,000 (F); (b) 12,000 units; (c) 2,40,000 kg; (d) 12,100 units; (e) 60,040 hours; (f) ₹73.15 per hour; (g) ₹36,000 (A); (h) ₹1,44,000 (A).

45. The wages budget for the last period was based on a standard repair time of 30 minutes per unit and a standard wage rate of ₹ 50 per hour. The actual data for the last period are as follows:

Number of units = 30,000 **[MTP May 2024]**

Labour rate variance = 7,500 (A)

Labour efficiency variance = Nil

From the information find out the actual rate of wages per unit

(a) ₹ 50 (b) ₹ 25.50 (c) ₹ 50.50 (d) ₹ 25.25

Ans. (b) ₹ 25.50

SOLUTION OF PRACTICE QUESTIONS

26. Basic Calculation

Particulars	Standard (1 unit of Z)			Actual (1 unit of Z)		
	Quantity	Rate	Amount	Quantity	Rate	Amount
Material	50	1	50	45	0.80	36

Calculation of variances

(a) Material Cost Variance = SC – AC
= 50 – 36 = ₹14 (F)

(b) Material Price Variance = (SP – AP) × AQ
= (1 – 0.80) × 45 = ₹9 (F)

(c) Material Usage Variance = (SQ – AQ) × SP
= (50 – 45) × 1 = ₹5 (F)

27.

Basic Calculation

Particulars	Standard (10 units)			Actual (10 units)			Revised Std. Quantity
	Quantity	Rate	Amount	Quantity	Rate	Amount	
Material X	600	15	9,000	640	17.50	11,200	$2460 \times \frac{600}{2400} = 615$
Material Y	800	20	16,000	950	18.00	17,100	$2460 \times \frac{800}{2400} = 820$

Material Z	1,000	25	25,000	870	27.50	23,925	$2460 \times \frac{1,000}{2400} = 1,025$
Input	2,400		50,000	870		23,925	2460

Calculation of Variances

1. Material Cost Variance = Standard Cost – Actual cost

   X = 9,000 – 11,200 = ₹2,200 (A)

   Y = 16,000 – 17,100 = ₹1,100 (A)

   Z = 25,000 – 23,925 = ₹1,075 (F)

   MCV = ₹2,225 (A)

2. Material Price Variance = (SP – AP) × AQ

   X = (14 – 17.50) × 640 = ₹1,600 (A)

   Y = (20 – 18) × 950 = ₹1,900 (F)

   Z = (25 – 27.50) × 870 = ₹2,175 (A)

   MPV = ₹1,875 (A)

3. Material Usage (or Quantity) Variance = (SQ – AQ) × SP

   X = (600 – 640) × 15 = ₹600 (A)

   Y = (800 – 950) × 20 = ₹3,000 (A)

   Z = (1,000 – 870) × 25 = ₹3,250 (A)

   MUV = ₹ 350 (A)

4. Material Mix Variance = (RSQ - AQ) × SP
   - X = (615 – 640) × 15 = ₹375 (A)
   - Y = (820 – 950) × 20 = ₹2,600 (A)
   - Z = (1,025 – 870) × 25 = ₹3,875 (F)
   - MMV = ₹ 900 (F)
5. Material Yield Variance = (SQ - RSQ) × SP
   - X = (600 – 615) × 15 = ₹225 (A)
   - Y = (800 – 820) × 20 = ₹400 (A)
   - Z = (1,000 – 1,025) × 25 = ₹625 (A)
   - MYV = ₹1,250 (A)

28.

(i) Material cost variance = Standard cost – Actual cost

3,625 (F) = Standard cost – 59,825

3,625 = Standard cost – 59,825

Standard cost = 63,450

Total standard input required for actual output = $\frac{1,480}{90\%} = 1,645$ kg

Standard quantity of material A = $\frac{800}{(800+600)} \times 1,645 = 940$ kg

Standard quantity of material B = $\frac{600}{(800+600)} \times 1,645$ = 705 kg

Standard cost of Material A + Standard cost of Material B = 63,450

$(SQ_A \times SP_A) + (SQ_B \times SP_B) = 63,450$

$(940 \times SP_A) + (705 \times 30) = 63,450$

$SP_A = \frac{42,300}{940}$

Standard price of material A = ₹45

(ii) Material price variance = (AQ × SP) – (AQ × AP)

175 (F) = (AQ × SP) – 59,825

175 = (AQ × SP) – 59,825

AQ × SP = 60,000

$(AQ_A \times SP_A) + (AQ_B \times SP_B) = 60,000$

$(900 \times 45) + (AQ_B \times 30) = 60,000$

$AQ_B = \frac{19,500}{30}$

Actual quantity of material B = 650 kg

(iii) Given, AQ × AP = 59,825

$(AQ_A \times AP_A) + (AQ_B \times AP_B) = 59,825$

$(900 \times AP_A) + (650 \times 32.50) = 59,825$

$AP_A = \frac{38,700}{900}$

Actual price of material A = ₹43

(iv) Total actual input quantity = 900 + 650 = 1,550 kg

Revised standard quantity of material A = $\frac{800}{(800+600)} \times 1,550$ = 886 kg

Revised standard quantity of material A = $\frac{600}{(800+600)} \times 1,550$ = 664 kg

(v) Material Mix Variance = (RSQ – AQ) × SP

Material A = (886 – 900) × 45 = ₹630 (A)

Material B = (664 – 650) × 30 = ₹420 (F)

₹210 (A)

29.

(a) MPV = (SR – AR) × AQ 51,000 = 10 × AQ AQ = 5,100 kg

Actual price = $\frac{7,14,000}{5,100}$ = ₹140

(b) MUV = (SQ – AQ) × SP = (5,000 – 5,100) × 150 = ₹15,000 (A)

(c) MCV = SC – AC = (5,000 × 150) – (5,100 × 140) = ₹7,50,000 – ₹7,14,000 = ₹36,000 (F)

30.

Particulars	Standard for 1 Job			Actual for 1 Job		
	Quantity	Rate	Amount	Quantity	Rate	Amount
Labour	1,000	50	50,000	900	$\frac{36,000}{900}$ = 40	36,000

Calculation of Variances:

Labour Cost Variance = SC – AC = 50,000 – 36,000 = ₹14,000 (F)

Labour Rate Variance = (SR – AR) × AQ = (50 – 40) × 900 = ₹9,000 (F)

Labour Efficiency Variance = (SQ – AQ) × SR = (1,000 – 900) × 50 = ₹5,000 (F)

31.

Category	Standard			Actual				
	Hours	Rate	Amount	Hours	Rate	Amount	Idle Hours	Hours Worked
Skilled	$\frac{65\times40\times1800}{2000}$ = 2340	45	1,05,300	50 × 40 = 2000	50	1,00,000	50 × 2 = 100	1900
Semi-skilled	$\frac{20\times40\times1800}{2000}$ = 720	30	21,600	30 × 40 = 1200	35	42,000	30 × 2 = 60	1140
Unskilled	$\frac{15\times40\times1800}{2000}$ = 540	15	8,100	20 × 40 = 800	10	8,000	20 × 2 = 40	760
Total	3,600		1,35,000	4,000		1,50,000	200	3,800

(a) Labour Cost Variance = SC – AC

Skilled	= 1,05,300 – 1,00,000	= ₹5,300 (F)
Semi-Skilled	= 21,600 – 42,000	= ₹20,400 (A)
Unskilled	= 8,100 – 8,000	= ₹100 (F)
		= ₹15,000 (A)

(b) Labour Efficiency Variance = (SH – AH) × SR

Skilled	= (2340 – 2000) × 45	= ₹19,800 (F)
Semi-Skilled	= (720 – 1200) × 30	= ₹12,600 (A)
Unskilled	= (540 – 800) × 15	= ₹3,300 (A)
		= ₹3,900 (F)

(c) Labour Idle time Variance = Idle hours × SR

Skilled	= 100 × 45	= ₹4,500 (F)
Semi-skilled	= 60 × 30	= ₹1,800 (F)
Unskilled	= 40 × 15	= ₹600 (F)
		= ₹6,900 (F)

32.

Basic Calculation

Particulars	Standard (10,000 units)			Actual (10,000 units)			Revised Std. Qty.
	Quantity	Rate	Amount	Quantity	Rate	Amount	
Skilled	10,000 × 2 = 20,000	6	1,20,000	18,000	7	1,26,000	$\frac{20,000}{1,00,000}$ × 1,07,000 = 21,400
Semi-skilled	10,000 × 3 = 30,000	4	1,20,000	33,000	3.5	1,15,500	$\frac{30,000}{1,00,000}$ × 1,07,000 = 32,100
Unskilled	10,000 × 5 = 50,000	3	1,50,000	58,000	4	2,32,000	$\frac{50,000}{1,00,000}$ × 1,07,000 = 53,500
Total	1,00,000		3,90,000	1,09,000		4,73,500	1,07,000

Particulars	Hours Paid	Idle Hours	Hours Worked
Skilled	18,000	500	17,500
Semi-skilled	33,000	700	32,300
Unskilled	58,000	800	57,200
Total	1,09,000	2,000	1,07,000

Calculation of Variances

(a) Labour Cost Variance = Standard Cost – Actual cost
- Skilled = 1,20,000 – 1,26,000 = ₹6,000 (A)
- Semi-skilled = 1,20,000 – 1,15,500 = ₹4,500 (F)
- Unskilled = 1,50,000 – 2,32,000 = ₹82,000 (A)
- LCV = ₹83,500 (A)

(b) Labour Rate Variance = (SR – AR) × AH paid
- Skilled = (6 – 7) × 18,000 = ₹18,000 (F)
- Semi-skilled = (4 – 3.5) × 33,000 = ₹16,500 (F)
- Unskilled = (3 – 4) × 58,000 = ₹58,000 (A)

- LRV = ₹59,500 (A)

(c) Labour Efficiency Variance = (SH – AH worked) × SR
- Skilled = (20,000 – 17,500) × 6 = ₹15,000 (F)
- Semi-skilled = (30,000 – 32,300) × 4 = ₹9,200 (A)
- Unskilled = (50,000 – 57,200) × 3 = ₹21,600 (A)
- LEV = ₹15,800 (A)

(d) Idle Time Variance = Idle Hours × SR
- Skilled = 500 × 6 = ₹3,000 (A)
- Semi-skilled = 700 × 4 = ₹2,800 (A)
- Unskilled = 800 × 3 = ₹2,400 (A)
- Idle time variance = ₹8,200 (A)

(e) Labour Mix Variance = (RSH – AH worked) × SR
- Skilled = (21,400 – 17,500) × 6 = ₹23,400 (F)
- Semi-skilled = (32,100 – 32,300) × 4 = ₹800 (A)
- Unskilled = (53,500 – 57,200) × 3 = ₹11,100 (A)
- LMV = ₹11,500 (F)

(f) Labour Yield Variance = (SH - RSH) × SR
- Skilled = (20,000 – 21,400) × 6 = ₹8,400 (A)
- Semi-skilled = (30,000 – 32,300) × 4 = ₹8,400 (A)
- Unskilled = (50,000 – 57,200) × 3 = ₹10,500 (A)
- LYV = ₹27,300 (A)

(b) Revised LRV
- Skilled = [(6 – 5.5) × 5000]+ [(6 – 7) × 13000]= ₹10,500(A)
- Semi skilled = (4 – 3.5) × 33000 = ₹16,500(F)
- Unskilled = (3 – 4) × 58000 = 58,000(A) = 52,000(A)

33.

Basic Calculation

Particulars	Standard (1,600 units)			Actual (1,600 units)			Revised Std. Qty.
	Quantity	Rate	Amount	Quantity	Rate	Amount	
Skilled	$\frac{40\times30}{2,000}\times1600 = 960$	70	67,200	40×40 = 1,600	75	1,20,000	$\frac{960}{1,760}\times1980 = 1,080$
Semi-skilled	$\frac{40\times15}{2,000}\times1600 = 480$	65	31,200	40×10 = 400	60	24,000	$\frac{480}{1,760}\times1980 = 540$

Unskilled	$\frac{40\times10}{2,000}\times1600 = 320$	50	16,000	40×5 = 200	52	10,400	$\frac{320}{1,760}\times1980 = 360$
Total	1,760		1,14,400	2,200		1,54,400	1,980

Particulars	Hours Paid	Idle Hours	Hours Worked
Skilled	40 × 40 =1,600	40 × 4 = 160	1,600 – 160 = 1,440
Semi-skilled	40× 10 = 400	10 × 4 = 40	400 – 40 = 360
Unskilled	40× 5 = 200	5 × 4 = 20	200 – 20 = 180
Total	22,00	220	1,980

Calculation of Variances

(i) Labour Cost Variance = Standard Cost – Actual cost
- Skilled = 67,200 – 1,20,000 = ₹52,800 (A)
- Semi-skilled = 31,200 – 24,000 = ₹7,200 (F)
- Unskilled = 16,000 – 10,400 = ₹5,600 (F)
- LCV = ₹40,000 (A)

(ii) Labour Rate Variance = (SR – AR) × AH paid
- Skilled = (70 – 75) × 1,600 = ₹8,000 (A)
- Semi-Skilled = (65 – 60) × 400 = ₹2,000 (F)
- Unskilled = (50 – 52) × 200 = ₹400 (A)
- LRV = ₹6,400 (A)

(iii) Labour Efficiency Variance = (SH – AH worked) × SR
- Skilled = (960 – 1,440) × 70 = ₹33,600 (A)
- Semi-Skilled = (480 – 360) × 65 = ₹7,800 (F)
- Unskilled = (320 – 180) × 50 = ₹7,000 (F)
- LEV = ₹18,800 (A)

(iv) Labour Mix Variance = (RSH – AH worked) × SR
- Skilled = (1,080 – 1,440) × 70 = ₹25,200 (A)
- Semi-Skilled = (540 –360) × 65 = ₹11,700 (F)
- Unskilled = (360 – 180) × 50 = ₹9,000 (F)
- LMV = ₹4,500 (A)

(v) Idle Time Variance = Idle Hours × SR
- Skilled = 160 × 70 = ₹11,200 (A)
- Semi-Skilled = 40 × 65 = ₹2,600 (A)
- Unskilled = 20 × 50 = ₹1,000 (A)
- Idle time variance = ₹14,800 (A)

34. SR – Standard labour Rate per Hour

AR – Actual labour rate per hour

SH – Standard Hours

AH – Actual hours

(a) Labour rate Variance = AH (SR – AR)

17,094 (₹8 – AR) = – 68,376

₹8 – AR = – 4

Or, AR = ₹12

(b) Labour Efficiency = $\frac{SH}{AH} \times 100 = 105.3$

$SH = \frac{AH}{100} \times 105.3 = \frac{17,094}{100} \times 105.3 = 17,999.982$ or, SH = 18,000 hours

(c) Labour Efficiency Variance = SR (SH – AH)

= ₹8(18,000 – 17,094) = 8 × 906 = ₹7,248 (F)

(d) Standard Labour Cost per Unit = $\frac{18,000 \times 8}{6,000} = ₹24$

(e) Actual Labour Cost per Unit = $\frac{17,094 \times 12}{6,000} = ₹34.19$

35. **Basic Calculation**

Particulars	Standard (1,800 units)			Actual (1,800 units)		
	Quantity	Rate	Amount	Quantity	Rate	Amount
Material	10×1,800 = 18,000	4	72,000	19,000	$\frac{88,000}{20,000} =$ 4.40	83,600
Labour	2.5 × 1,800 = 4,500	4	18,000	4,950	$\frac{24,750}{4,950} = 5$	24,750

Material Cost Variance = SC – AC
= 72,000 – 83,600 = ₹11,600 (A)

Material Price Variance = (SP – AP) × AQ
= (4 – 4.40) × 19,000 = ₹7,600 (A)

Material Usage Variance = (SQ – AQ) × SR
= (18,000 – 19,000) × 4 = ₹4,000 (A)

Labour Cost Variance = SC – AC
= 18,000 – 24,750 = ₹6,750 (A)

Labour Rate Variance = (SR – AR) × AH paid

= (4 – 5) × 4,950 = ₹4,950 (A)

Labour efficiency variance = (SH – AH worked) × SR

= (4,500 – 4,950) × 4 = ₹1,800 (A)

36.

Working Note:

Quantity of material purchased and used:

Number of units produced	1,000 units
Standard input per unit	30 kg
Standard quantity (kg)	30,000 kg
Add: Excess usage	7,200 kg
Actual quantity usage	37,200 kg
Add: Closing stock	10,000 kg
Less: Opening stock	5,000 kg
Quantity of material purchased	42,200 kg

(i) Direct material price variance = (SP – AP) × Actual quantity used

= (350 – 365) × 37,200 = ₹5,58,000 (A)

This can be alternatively computed on the basis of actual quantity purchased.

Direct material usage variance = (SQ – AQ) × SP

= (30,000 – 37,200) × 350 = ₹25,20,000 (A)

(ii) Direct labour rate variance = (SR – AR) × Actual hours

= (80 – 82) × 5,300 = ₹10,600 (A)

Direct labour efficiency variance = (SH – AH) × SR

= [(1,000×5) – 5,300] × 80 = ₹24,000 (A)

37.

Particulars	Standard (360 units)			Actual (360 units)		
	Qty.	Rate ₹	Amount ₹	Qty.	Rate ₹	Amount ₹
Variable OHs	$\frac{8,000}{400}\times 360$ = 7,200	$\frac{10,050}{8,000}$ = 1.25	9,000	7,000	$\frac{9,150}{7,000}$ = 1.3071	9,150

Variable OH Cost Variance = Recovered OHs – Actual OHs

= 9,000 – 9,150 = ₹150 (A)

Variable OH Expenditure Variance = (RR – AR) × Actual hours

= (1.25 – 1.3071) × 7,000 = ₹400 (A)

Variable OH Efficiency Variance = (SH – AH) × RR

= (7,200 – 7,000) × 1.25 = ₹250 (F)

38. Fixed overhead volume variance = Recovered OHs – Actual OHs

= (15,000 units × ₹5) – (20,000 units × ₹5)

= 75,000 – 1,00,000

= ₹25,000 (A)

Fixed overhead expense variance = Budgeted OHs – Actual Fixed OHs
= (20,000 units × ₹5) – (Total OHs – Variable OHs)
= 1,00,000 – [3,00,000 – (15,000 units × ₹10)]
= 1,00,000 – 1,50,000
= ₹50,000 (A)

39. Basic Calculations:

	Budgeted Hours	Recovery Rate	Budgeted Overheads
	30,000÷1 = 30,000	1	30,000
Revised Budgeted Hours	**Actual Hours**		**Actual Overheads**
$\frac{30,000}{25}\times 27 = 32,400$	31,500		31,000
	Standard Hours	**Recovery Rate**	**Recovered Overheads**
	$\frac{30,000}{20,000}\times 22,000$ =33,000	1	33,000

Calculation of Variances

(i) Expenditure Variance = Budgeted overhead – Actual overhead
= 30,000 – 31,000 = ₹1,000 (A)

(ii) Volume Variance = Recovered overhead – Budgeted overhead
= 33,000 – 30,000 = ₹3,000 (F)

(iii) F. O. Cost Variance = Recovered overhead – Actual overhead
= 33,000 – 31,000 = ₹2,000 (F)

40. Basic Calculations

Particulars	Standard (32,500 units)			Actual (32,500 units)		
	Hrs.	Rate ₹	Amount ₹	Hrs.	Rate ₹	Amount ₹
Variable Expenses	$\frac{30,000}{30,000}\times 32,500$ = 32,500	$\frac{60,000}{30,000} = 2$	65,000	33,000	$\frac{68,000}{33,000}$ = 2.0606	68,000

	Budgeted Hours	Recovery Rate	Budgeted Overheads
	30,000	45,000 × 30,000 = 1.50	45,000
Revised Bud. hours	**Actual Hours**		**Actual Overheads**

$\frac{30,000}{25}\times 26$ = 31,200	33,000		50,000
	Standard Hours	**Recovery Rate**	**Recovered Overheads**
	$\frac{30,000}{30,000}\times 32,500$ = 32,500	1.50	48,750

Variable Overhead Variance

(i) Variable Overhead Budget Variable (A) = (SR – AR) × AH = (2 – 2.0606) × 33,000 = ₹2,000

(ii) Variable Overhead Efficiency Variable (A) = (SH – AH) × SR = (32,500 – 33,000) × 2 = ₹1,000

(iii) Variable Overhead Cost Variable (A) = Absorbed OHs – Actual OHs = 65,000 – 68,000 = ₹3,000

Fixed Overhead Variances

(i) Fixed Overhead Budget Variance = Budgeted overhead – Actual overhead
= 45,000 – 50,000 = ₹5,000 (A)

(ii) Fixed Overhead Volume Variance = Absorbed OHs – Budgeted OHs
= 48,750 – 45,000 = ₹3,750 (F)

(iii) Fixed Overhead Cost Variance = Absorbed OHs – Actual OHs
= 48,750 – 50,000 = ₹1,250 (A)

(iv) Fixed Overhead Capacity Variance = (AH – RBH) × RR
= (33,000 – 31,200) × 1.50 = ₹2,700 (F)

(v) Fixed Overhead Calendar Variance = (RBH – BH) × RR
= (31,200 – 30,000) × 1.50 = ₹1,800

41. Basic Calculations

Particulars	Standard			Actual		
	Hrs.	Rate ₹	Amount ₹	Hrs.	Rate ₹	Amount ₹
Variable Expenses	8,800	$\frac{1,06,080}{8,840}$ = 12	1,05,600	8,100	$\frac{1,02,000}{8,100}$ = 12.5926	1,02,000

Budgeted Hours	Recovery Rate	Budgeted Overheads
8,840	25	2,21,000
Actual Hours		**Actual Overheads**

8,100		2,00,000
Standard Hours	**Recovery Rate**	**Recovered Overheads**
8,800	25	2,20,000

(i) (a) Variable overhead expenditure variance = (SR – AR) × Actual Hrs.
= (12 – 12.5926) × 8,100 = ₹4,800 (A)

(b) Variable overhead efficiency variance = (SH – AH) × Std. Rate
= (8,800 – 8,100) × 12 = ₹8,400 (F)

(ii) (a) Fixed overhead budget variance = Budgeted OH – Actual OH
= 2,21,000 – 2,00,000 = ₹21,000 (F)

(b) Fixed overhead capacity variance = (AH – BH) × Recovery rate
= (8,100 – 8,840) × 25 = ₹18,500 (A)

(c) Fixed overhead efficiency variance = (SH – AH) × Recovery rate
= (8,800 – 8,100) × 25 = ₹17,500 (F)

(iii) (a) Capacity ratio $= \frac{\text{Actual Hours}}{\text{Budgeted Hours}} \times 100 = \frac{8,100}{8,840} \times 100 = 91.63\%$

(b) Efficiency ratio $= \frac{\text{Standard Hours}}{\text{Actual Hours}} \times 100 = \frac{8,800}{8,100} \times 100 = 108.64\%$

(c) Activity ratio $= \frac{\text{Standard Hours}}{\text{Budgeted Hours}} \times 100 = \frac{8,800}{8,840} \times 100 = 99.54\%$

42.

(i) Material usage variance = (Std. quantity – Actual quantity) × Std. price
= (18,000 – 17,800) × 90 = ₹18,000 (F)

(ii) Material price variance = (Std. price – Actual price) × Actual qty.
= (90 – 92) × 17,800 = ₹35,600 (A)

(iii) Material cost variance = Std. cost – Actual cost
= (18,000 × 90) – 16,37,600 = ₹17,600 (A)

(iv) Labour Efficiency variance = (Std. hours – Actual hours) × Std. rate
= [(1,800 × 8) – 14,000] × 100 = ₹40,000 (F)

(v) Labour Rate variance = (Std. rate – Actual rate) × Actual hours
= (100 – 104) × 14,000 = ₹56,000 (A)

(vi) Labour cost variance = Std. cost – Actual cost
= (1,800 × 8 × 100) – 14,56,000 = ₹16,000 (A)

(vii) Variable cost variance = Std. variable cost – Actual variable cost
= (1,800 × 8 × 15) – 2,17,500 = ₹1,500 (A)

(viii) Fixed OHs cost variance = Recovered overheads – Actual overheads
= (1,800 × 400) – 7,68,000 = ₹48,000 (A)

43. Working Note

(a) Budgeted fixed overhead rate = 4,50,000 ÷ 30,000 = ₹15 per hour

(i) Material cost variance = Standard cost – Actual cost
= (4,800 × 15kg × ₹15) – 9,85,000 = ₹95,000 (F)

(ii) Labour cost variance = Standard cost – Actual cost
= (4,800 × 6 hours × ₹5) – 1,40,000 = ₹4,000 (F)

(iii) Fixed OH cost variance = Recovered Overheads – Actual Overheads
= (4,800 × 6 hours × ₹15) – 4,70,000 = ₹38,000 (A)

(iv) Variable OH cost variance = Recovered Overheads – Actual Overheads
= (4,800 × 6 hours × ₹12) – 3,60,200 = ₹14,600 (A)

44. (a) Direct material cost variance = Material price variance + Material usage variance
= 4,80,000 + 48,000 = ₹5,28,000 (F)

(b) Fixed OH expenditure variance = Budgeted OHs – Actual OHs

1,80,000 (A) = [Budgeted output × (5 hrs. × ₹72)] – 45,00,000

– 1,80,000 = (Budgeted output × 360) – 45,00,000

$$\text{Budgeted output} = \frac{45,00,000 - 1,80,000}{360} = 12,000 \text{ units}$$

(c) Material price variance = (SP – AP) × Actual quantity

4,80,000 (F) = (24 – 22) × Actual quantity

Actual quantity = 2,40,000 kg

(d) Labour cost variance = Standard labour cost – Actual labour cost

LRV + LEV = Standard labour cost – 43,92,000

69,120 (A) + 33,120 (F) = Standard labour cost – 43,92,000

Standard labour cost = 43,92,000 – 69,120 + 33,120 = ₹43,56,000

$$\text{Actual output} = \frac{\text{Standard labour cost}}{\text{Standard wage rate per unit}} = \frac{43,56,000}{(72 \times 5)} = 12,100 \text{ units}$$

(e) Labour efficiency variance = (SH – AH) × SR

33,120 (F) = [(12,100 × 5) – AH] × 72

460 = 60,500 – Actual hours

Actual hours = 60,500 – 460 = 60,040 hours

$$\text{(f) Actual wage rate per hour} = \frac{\text{Actual wages}}{\text{Actual hours}} = \frac{43,92,000}{60,040} = ₹73.15 \text{ per hour}$$

(g) Labour cost variance = LEV + LRV = 33,120 (F) + 69,120 (A) = ₹36,000 (A)

(h) Production OH cost variance = Recovered OHs – Actual OHs
= (12,100 units × ₹360) – 45,00,000
= 1,44,000 (A)

45. Labour rate variance = (SR – AR) × Actual hours paid
7,500 (A) = (50 – AR) × (30,000 30/60)
–7,500 =(50 – AR) × 15,000
AR = (7,500 ÷ 15,000) + 50 = ₹50.50
Actual wage per unit = 50.50 × 30/60 = ₹25.25

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