### Basic Concepts

<table>
<thead>
<tr>
<th>Administrative Cost Variance</th>
<th>Measurement of the extent of any over- or underspend on administrative costs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget Variance</td>
<td>Difference, for each cost or revenue element in a budget, between the budgeted amount and the actual cost or revenue. Where flexible budgeting is employed, it is the difference between the flexed budget and the actual value.</td>
</tr>
</tbody>
</table>
| Cost                        | As a noun – The amount of cash or cash equivalent paid or the fair value of other consideration given to acquire an asset at the time of its acquisition or construction.  
As a verb – To ascertain the cost of a specified thing or activity. The word cost can rarely stand alone and should be qualified as to its nature and limitations. |
| Direct Material Total Variance | Measurement of the difference between the standard material cost of the output produced and the actual material cost incurred.  
Where the quantities of material purchased and used are different, the total variance should be calculated as the sum of the usage and price variances. |
| Direct Material Price Variance | Difference between the actual price paid for purchased materials and their standard cost.  
The material price variance may also be calculated at the time of material withdrawal from stores. In this case, the stock accounts are maintained at actual cost, price variances being extracted at the time of material usage rather than of purchase.  
The latter method is not usually recommended because one of the advantages of a standard costing system is the valuation of all stock at standard costs. |
| Direct Material Usage Variance | Measures efficiency in the use of material, by comparing standard material usage for actual production with actual material used, the difference is valued at standard cost. |
5.2 Advanced Management Accounting

The direct material usage variance may be divided into mix and yield variances if several materials are mixed in standard proportions.

<p>| Direct Material Mix Variance | Subdivision of the material usage variance. If different materials can be substituted the mix variance measures the cost of any variation from the standard mix of materials. |
| Direct Material Yield Variance | Subdivision of the material usage variance. Measures the effect on cost of any difference between the actual usage of material and that justified by the output produced. |
| Direct Labour Total Variance | Indicates the difference between the standard direct labour cost of the output which has been produced and the actual direct labour cost incurred. |
| Direct Labour Rate Variance | Indicates the actual cost of any change from the standard labour rate of remuneration. |
| Direct Labour Efficiency Variance | Standard labour cost of any change from the standard level of labour efficiency. |
| Direct Labour Idle Time Variance | This variance occurs when the hours paid exceed the hours worked and there is an extra cost caused by this idle time. Its computation increases the accuracy of the labour efficiency variance. |
| Direct Labour Mix Variance | Subdivision of the direct labour efficiency variance. If grades of labour can be substituted the mix variance measures the cost of any variation from the standard mix of grades. |
| Direct Labour Yield Variance | Subdivision of the direct labour efficiency variance. Measures the effect on cost of any difference between the actual usage of labour and that justified by the output produced. |
| Fixed Production Overhead Total Variance | The difference between the fixed production overhead absorbed by actual production and the actual fixed production overhead incurred. |
| Fixed Production Overhead Volume Variance | A measure of the over- or under-absorption of overhead cost caused by actual production volume differing from that budgeted. |
| Fixed Overhead Capacity/ Efficiency Variance | Little used subdivision of the fixed production overhead volume variance. |
| Fixed Production Overhead Expenditure Variance | The difference between the fixed production overhead which should have been incurred in the period, and that which was incurred. |</p>
<table>
<thead>
<tr>
<th><strong>Joint Variance</strong></th>
<th>A variance which is caused by both the prices and quantities of inputs differing from the specifications in the original standard.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Market Size Variance</strong></td>
<td>A subdivision of the sales volume contribution or margin variance, applicable when the actual market size of a product or product group is known. It indicates the change in contribution or margin caused by a change in the size of the market.</td>
</tr>
<tr>
<td><strong>Market Share Variance</strong></td>
<td>A subdivision of the sales volume contribution or margin variance, applicable when the actual market size of a product or product group is known. It indicates the change in contribution or margin caused by a change in market share.</td>
</tr>
<tr>
<td><strong>Marketing Cost Variance</strong></td>
<td>Where marketing cost contains both fixed and variable components, separate variances should be calculated.</td>
</tr>
<tr>
<td><strong>Operational Variance</strong></td>
<td>Classification of variances in which non-standard performance is defined as being that which differs from an ex post standard. Operational variances can relate to any element of the standard product specification.</td>
</tr>
<tr>
<td><strong>Planning Variance</strong></td>
<td>Classification of variances caused by ex-ante budget allowances being changed to an ex post basis. Also known as a revision variance.</td>
</tr>
<tr>
<td><strong>Standard</strong></td>
<td>Benchmark measurement of resource usage or revenue or profit generation, set in defined conditions. Standards can be set on a number of bases: (i) on an ex ante estimate of expected performance; (ii) on an ex post estimate of attainable performance; (iii) on a prior period level of performance by the same organisation; (iv) on the level of performance achieved by comparable organisations; or (v) on the level of performance required to meet organisational objectives. Standards may also be set at attainable levels that assume efficient levels of operation, but that include allowance for normal loss, waste and machine down time, or at ideal levels that make no allowance for the above losses, and are only attainable under the most favourable conditions. The effect of different levels on staff motivation will be an important influence on the type of standards that are used.</td>
</tr>
<tr>
<td><strong>Standard Cost Card/Standard Product</strong></td>
<td>Document or digital record detailing for each individual product, the standard inputs required for production as well as the standard selling price. Inputs are normally divided into</td>
</tr>
</tbody>
</table>
### Specification

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>labour, material and overhead categories, and both price and quantity information is shown for each.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard Direct Labour Cost</th>
<th>Planned cost of direct labour. Standard Direct Labour Cost equals to Standard Direct Labour Time for One Unit of Product multiply by Standard Labour Rate. There are separate calculations for different processes and/or grades of labour.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Standard ex ante</th>
<th>Before the event. An ex ante budget or standard is set before a period of activity commences.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Standard, ex post</th>
<th>After the event. An ex post budget, or standard, is set after the end of a period of activity, when it can represent the optimum achievable level of performance in the conditions which were experienced. Thus the budget can be flexed, and standards can reflect factors such as unanticipated changes in technology and in price levels. This approach may be used in conjunction with sophisticated cost and revenue modelling to determine how far both the plan and the achieved results differed from the performance that would have been expected in the circumstances which were experienced.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Standard Hour or Minute</th>
<th>Amount of work achievable, at standard efficiency levels, in an hour or minute.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Standard Performance – Labour</th>
<th>Level of efficiency which appropriately trained, motivated and resourced employees can achieve in the long-run.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Standard Costing</th>
<th>Control technique that reports variances by comparing actual costs to pre-set standards so facilitating action through management by exception.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Sales Mix Contribution/Profit Margin Variance</th>
<th>Subdivision of the sales volume contribution/profit margin variance. The change in the contribution/profit margin caused by a change in the mix of the products or services sold.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Sales Price Variance</th>
<th>Change in revenue caused by the actual selling price differing from that budgeted.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Sales Quantity Contribution/Profit Variance</th>
<th>Subdivision of the sales volume contribution/ profit variance. It is relevant if there are multiple products and the actual sales mix differs from the budgeted sales mix. In these situations this variance, together with the sales mix contribution/profit variance, will comprise the sales volume contribution/profit variance (for all products).</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Sales Volume Contribution/Profit Variance</th>
<th>Measure of the effect on contribution/profit of not achieving the budgeted volume of sales.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variance Type</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>Sales Volume Revenue Variance</strong></td>
<td>Change in sales revenue caused by sales volume differing from that budgeted. This variance is logical but little used because it cannot be combined with contribution/profit variances in reconciling budget with actual contribution/profit. In principle, if several products are considered, the sales mix revenue variance and total sales volume revenue variance can be calculated.</td>
</tr>
<tr>
<td><strong>Total Profit Variance</strong></td>
<td>Difference between the actual profit and the profit in the budget. The total profit variance is the sum of all the subsidiary variances.</td>
</tr>
<tr>
<td><strong>Variance</strong></td>
<td>Difference between a planned, budgeted or standard cost and the actual cost incurred. The same comparisons may be made for revenues.</td>
</tr>
<tr>
<td><strong>Variance Analysis</strong></td>
<td>Evaluation of performance by means of variances, whose timely reporting should maximise the opportunity for managerial action.</td>
</tr>
<tr>
<td><strong>Variable Production Overhead Total Variance</strong></td>
<td>Measures the difference between variable overhead that should be used for actual output and variable production overhead actually used. The variable production overhead efficiency and rate variances are subdivisions of this variance.</td>
</tr>
<tr>
<td><strong>Variable Production Overhead Efficiency Variance</strong></td>
<td>Standard variable overhead cost of any change from the standard level of efficiency. This is directly analogous to the calculation of direct labour efficiency variance and implicitly assumes that variable overhead is recovered on a direct labour hour base. However, the formula can equally be used if variable overhead is recovered on a machine or process hour base.</td>
</tr>
<tr>
<td><strong>Variable Production Overhead Expenditure Variance</strong></td>
<td>Indicates the actual cost of any change from the standard rate per hour. Hours refer to either labour or machine hours depending on the recovery base chosen for variable production overhead.</td>
</tr>
</tbody>
</table>

(*) Source CIMA’s Official Terminology
5.6 Advanced Management Accounting

**Formulae**

**Direct Material Variances**

**Direct Material Total Variance**

\[ \text{Total Variance} = \text{Standard Direct Material Cost} \times \text{Actual Production Volume} - \text{Actual Cost of Direct Material} \]

\[ [(\text{SQ} \times \text{SP}) - (\text{AQ} \times \text{AP})] \]

**Direct Material Price Variance**

\[ \text{Price Variance} = \text{Standard Price} - \text{Actual Price} \times \text{Actual Quantity} \]

\[ [(\text{SP} - \text{AP}) \times \text{AQ}] \]

**Direct Material Usage Variance**

\[ \text{Usage Variance} = \text{Standard Price} \times \text{Standard Quantity} - \text{Actual Quantity} \times \text{Standard Price} \]

\[ [(\text{SQ} \times \text{SP}) - (\text{AQ} \times \text{SP})] \]

**Direct Material Mix Variance**

\[ \text{Mix Variance} = \text{Standard Price} \times \text{Actual Quantity in Standard Proportion} - \text{Actual Quantity} \times \text{Standard Price} \]

\[ [(\text{RAQ} \times \text{SP}) - (\text{AQ} \times \text{SP})] \]

**Direct Material Yield Variance**

\[ \text{Yield Variance} = \text{Standard Price} \times \text{Standard Quantity} - \text{Actual Quantity in Standard Proportion} \times \text{Standard Price} \]

\[ [(\text{SQ} \times \text{SP}) - (\text{RAQ} \times \text{SP})] \]

**Alternative Formula**

\[ \text{Total Actual Quantity} \times \{ \text{Average Standard Price per unit of Standard Mix} \times \text{Standard Mix} \text{Less Average Standard Price per unit of Actual Mix} \} \]

\[ [(\text{Total Actual Quantity} \times \text{SP}) - (\text{Total Standard Quantity} \times \text{SP})] \]

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## Standard Costing 5.7

**Note:**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ</td>
<td>Standard Quantity = Expected Consumption for Actual Output</td>
</tr>
<tr>
<td>AQ</td>
<td>Actual Quantity of Material Consumed</td>
</tr>
<tr>
<td>RAQ</td>
<td>Revised Actual Quantity = Actual Quantity Rewritten in Standard Proportion</td>
</tr>
<tr>
<td>SP</td>
<td>Standard Price per Unit</td>
</tr>
<tr>
<td>AP</td>
<td>Actual Price per Unit</td>
</tr>
<tr>
<td>(*)</td>
<td>Standard Cost refers to ‘Standard Cost of Standard Quantity for Actual Output’</td>
</tr>
<tr>
<td>(*)</td>
<td>Direct Material Total Variance (also known as material cost variance)</td>
</tr>
</tbody>
</table>

### Material Purchase Price Variance

\[
\text{Material Purchase Price Variance} = \left[ \text{Standard Cost of Actual Quantity} - \text{Actual Cost} \right] \\
\text{(The difference between the Standard Price and Actual Price for the actual quantity of material purchased)} \\
\text{Or} \\
\left[ (SP - AP) \times PQ \right] \\
\left[ (SP \times PQ) - (AP \times PQ) \right]
\]

**Note:**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>PQ</td>
<td>Purchase Quantity</td>
</tr>
<tr>
<td>SP</td>
<td>Standard Price</td>
</tr>
<tr>
<td>AP</td>
<td>Actual Price</td>
</tr>
</tbody>
</table>
5.8 Advanced Management Accounting

Direct Labour Variances

**Direct Labour Total Variance**

\[ \text{[Standard Cost} - \text{Actual Cost]} \]

(The difference between the Standard Direct Labour Cost and the Actual Direct Labour Cost incurred for the production achieved)

\[ (\text{SH} \times \text{SR}) - (\text{AH}^* \times \text{AR}) \]

**Direct Labour Rate Variance**

\[ \text{[Standard Cost of Actual Time – Actual Cost]} \]

(The difference between the Standard Rate per hour and Actual Rate per hour for the Actual Hours paid)

\[ (\text{SR} - \text{AR}) \times \text{AH}^* \]

Or

\[ (\text{SR} \times \text{AH}^*) - (\text{AR} \times \text{AH}^*) \]

**Direct Labour Idle Time Variance**

\[ \text{[Standard Rate per Hour x Actual Idle Time]} \]

(The difference between the Actual Idle Hours and Actual Hours worked at Standard Rate)

\[ (\text{AH}^* - \text{AH}^#) \times \text{SR} \]

Or

\[ (\text{AH}^* \times \text{SR}) - (\text{AH}^# \times \text{SR}) \]

**Direct Labour Efficiency Variance**

\[ \text{[Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time]} \]

(The difference between the Actual Hours for the Standard Hours specified for actual production and Actual Hours worked at Standard Rate)

\[ (\text{SH} - \text{AH}^#) \times \text{SR} \]

Or

\[ (\text{SH} \times \text{SR}) - (\text{AH}^# \times \text{SR}) \]

**Direct Labour Mix Variance**

\[ \text{[Standard Cost of Actual Time Worked in Standard Proportion – Standard Cost of Actual Time Worked]} \]

(The difference between the Actual Hours worked in standard proportion and Actual Hours worked in actual proportion, at Standard Rate)

\[ (\text{RAH} - \text{AH}^#) \times \text{SR} \]

Or

\[ (\text{RAH} \times \text{SR}) - (\text{AH}^# \times \text{SR}) \]

**Direct Labour Yield Variance**

\[ \text{[Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time Worked in Standard Proportion]} \]

(The difference between the Standard Hours specified for actual production and Actual Hours worked in standard proportion, at Standard Rate)

\[ (\text{SH} - \text{RAH}) \times \text{SR} \]

Or

\[ (\text{SH} \times \text{SR}) - (\text{RAH} \times \text{SR}) \]
Alternate Formula

<table>
<thead>
<tr>
<th>Total Actual Time Worked (hours)</th>
<th>{Average Standard Rate per hour of Standard Gang Less Average Standard Rate per hour of Actual Gang}</th>
</tr>
</thead>
</table>

Alternate Formula

\[\text{Average Standard Rate per hour of Standard Gang} \times \{\text{Total Standard Time (hours)} \less \text{Total Actual Time Worked (hours)}\}\] on the basis of hours worked

Note:
- \(\text{SH} = \) Standard Hours = Expected time (Time allowed) for Actual Output
- \(\text{AH}^* = \) Actual Hours paid for
- \(\text{AH}^* = \) Actual Hours worked
- \(\text{RAH} = \) Revised Actual Hours = Actual Hours (worked) rewritten in Standard Proportion
- \(\text{SR} = \) Standard Rate per Labour Hour
- \(\text{AR} = \) Actual Rate per Labour Hour Paid
- \(\text{(2)} = \) Standard Cost refers to 'Standard Cost of Standard Time for Actual Output'
- \(\text{(1)} = \) Direct Labour Total Variance (also known as labour cost variance)

\text{In the absence of idle time}

\[\text{Actual Hours Worked} = \text{Actual Hours Paid}\]

Idle Time is a period for which a workstation is available for production but is not used due to e.g. shortage of tooling, material or operators. During Idle Time, Direct Labour Wages are being paid but no output is being produced. The cost of this can be identified separately in an Idle Time Variance, so that it is not 'hidden' in an adverse Labour Efficiency Variance.

Some organizations face Idle Time on regular basis. In this situation the Standard Labour Rate may include an allowance for the cost of the expected idle time. Only the impact of any unexpected or abnormal Idle Time would be included in the Idle Time Variance.
Fixed Production Overhead Variances

**Fixed Overhead Total Variance**
(Absorbed Fixed Overheads) Less (Actual Fixed Overheads)

**Fixed Overhead Expenditure Variance**
(Budgeted Fixed Overheads) Less (Actual Fixed Overheads)

**Fixed Overhead Volume Variance**
(Absorbed Fixed Overheads) Less (Budgeted Fixed Overheads)

**Fixed Overhead Capacity Variance**
(Budgeted Fixed Overheads for Actual Hours) Less (Budgeted Fixed Overheads)

**Fixed Overhead Efficiency Variance**
(Absorbed Fixed Overheads) Less (Budgeted Fixed Overheads for Actual Hours)

Or

**Fixed Overhead Capacity Variance**
(Budgeted Fixed Overheads for Actual Hours) Less (Possible Fixed Overheads)

**Fixed Overhead Calendar Variance**
(Possible Fixed Overheads) Less (Budgeted Fixed Overheads)

**Fixed Overhead Efficiency Variance**
(Absorbed Fixed Overhead) Less (Budgeted Fixed Overheads for Actual Hours)

# Actual Hours (Worked)
Note:

**Standard Fixed Overheads for Production (Absorbed)**
- Standard Fixed Overhead Rate per Unit × Actual Production in Units
- Standard Fixed Overhead Rate per Hour × Standard Hours for Actual Production

**Budgeted Fixed Overheads**
- It represents the amount of fixed overhead which should be spent according to the budget or standard during the period
- Standard Fixed Overhead Rate per Unit × Budgeted Production in Units
- Standard Fixed Overhead Rate per Hour × Budgeted Hours

**Actual Fixed Overheads Incurred**

**Budgeted Fixed Overheads for Actual Hours**
- Standard Fixed Overhead Rate per Hour × Actual Hours

**Possible Fixed Overheads**
- Expected Fixed Overhead for Actual Days Worked
- \( \frac{\text{Budgeted Fixed Overhead}}{\text{Budgeted Days}} \times \text{Actual Days} \)

\(^{(a)}\) = Fixed Overhead Total Variance also known as ‘Fixed Overhead Cost Variance’

<table>
<thead>
<tr>
<th>Fixed Overhead Efficiency Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Absorbed Fixed Overheads) – (Budgeted Fixed Overheads for Actual Hours)</td>
</tr>
<tr>
<td>( \text{Or} )</td>
</tr>
<tr>
<td>(Standard Fixed Overhead Rate per Hour × Standard Hours for Actual Output) – (Standard Fixed Overhead Rate per Hour × Actual Hours)</td>
</tr>
<tr>
<td>( \text{Or} )</td>
</tr>
<tr>
<td>Standard Fixed Overhead Rate per Hour × (Standard Hours for Actual Output – Actual Hours)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fixed Overhead Capacity Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Budgeted Fixed Overheads for Actual Hours) – (Budgeted Fixed Overheads)</td>
</tr>
<tr>
<td>( \text{Or} )</td>
</tr>
<tr>
<td>(Standard Fixed Overhead Rate per Hour × Actual Hours) – (Standard Fixed Overhead Rate per Hour × Budgeted Hours)</td>
</tr>
<tr>
<td>( \text{Or} )</td>
</tr>
<tr>
<td>Standard Fixed Overhead Rate per Hour × (Actual Hours – Budgeted Hours)</td>
</tr>
<tr>
<td>Fixed Overhead Volume Variance-I</td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td>(Absorbed Fixed Overheads) – (Budgeted Fixed Overheads)</td>
</tr>
<tr>
<td>Or</td>
</tr>
<tr>
<td>(Standard Fixed Overhead Rate per Unit × Actual Output) – (Standard Fixed Overhead Rate per Unit × Budgeted Output)</td>
</tr>
<tr>
<td>Or</td>
</tr>
<tr>
<td>Standard Fixed Overhead Rate per Unit × (Actual Output – Budgeted Output)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fixed Overhead Volume Variance-II</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Absorbed Fixed Overheads) – (Budgeted Fixed Overheads)</td>
</tr>
<tr>
<td>Or</td>
</tr>
<tr>
<td>(Standard Fixed Overhead Rate per Hour × Standard Hours for Actual Output) – (Standard Fixed Overhead Rate per Hour × Budgeted Hours)</td>
</tr>
<tr>
<td>Or</td>
</tr>
<tr>
<td>Standard Fixed Overhead Rate per Hour × (Standard Hours for Actual Output – Budgeted Hours)</td>
</tr>
<tr>
<td>Or</td>
</tr>
<tr>
<td>Standard Fixed Overhead Rate per Hour × (Standard Hours per Unit × Actual Output – Standard Hours per Unit × Budgeted Output)</td>
</tr>
<tr>
<td>Or</td>
</tr>
<tr>
<td>(Standard Fixed Overhead Rate per Hour × Standard Hours per Unit) × (Actual Output – Budgeted Output)</td>
</tr>
<tr>
<td>Or</td>
</tr>
<tr>
<td>Standard Fixed Overhead Rate per Unit × (Actual Output – Budgeted Output)</td>
</tr>
</tbody>
</table>

Overhead Variances can also be affected by idle time. It is usually assumed that Overheads are incurred when labour is working, not when it is idle. Accordingly, hours worked has been considered for the calculation of Variable and Fixed Overheads Variances.
Variable Production Overhead Variances

<table>
<thead>
<tr>
<th>Variable Overhead Total Variance*</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Standard Variable Overheads for Production – Actual Variable Overheads)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable Overhead Expenditure (Spending) Variance</th>
<th>Variable Overhead Efficiency Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Budgeted Variable Overheads for Actual Hours*)</td>
<td>(Standard Variable Overheads for Production)</td>
</tr>
<tr>
<td>Less (Actual Variable Overheads)</td>
<td>Less (Budgeted Variable Overheads for Actual Hours*)</td>
</tr>
</tbody>
</table>

* Actual Hours (Worked)

Note:

Standard Variable Overheads for Production/Charged to Production
- Standard/Budgeted Variable Overhead Rate per Unit × Actual Production (Units)
- Standard Variable Overhead Rate per Hour × Standard Hours for Actual Production

Actual Overheads Incurred

Budgeted Variable Overheads for Actual Hours
- Standard Variable Overhead Rate per Hour × Actual Hours
- Variable Overhead Total Variance also known as ‘Variable Overhead Cost Variance’

Variable Overhead Efficiency Variance

- (Standard Variable Overheads for Production) – (Budgeted Overheads for Actual Hours)
- (Standard Variable Overhead Rate per Hour × Standard Hours for Actual Output) – (Standard Variable Overhead Rate per Hour × Actual Hours)
- Standard Variable Overhead Rate per Hour × (Standard Hours for Actual Output – Actual hours)

Variable Overhead Expenditure Variance

- (Budgeted Variable Overheads for Actual Hours) – (Actual Variable Overheads)
- (Standard Rate per Hour × Actual Hours) – (Actual Rate per Hour × Actual Hours)
- Actual Hours × (Standard Rate per Hour – Actual Rate per Hour)
Sales Variances (Turnover or Value)

Sales Variance
(Actual Sales) Less (Budgeted Sales)

\[\text{Sales Variance} = (AP \times AQ) - (BP \times BQ)\]

Sales Price Variance
(Actual Sales) Less (Standard Sales)

\[\text{Sales Price Variance} = (AP \times AQ) - (BP \times AQ)\]

\[\text{Sales Price Variance} = AQ \times (AP - BP)\]

Sales Volume Variance
(Standard Sales) Less (Budgeted Sales)

\[\text{Sales Volume Variance} = (BP \times AQ) - (BP \times BQ)\]

\[\text{Sales Volume Variance} = BP \times (AQ - BQ)\]

Sales Mix Variance
(Standard Sales) Less (Revised Standard Sales)

\[\text{Sales Mix Variance} = (BP \times AQ) - (BP \times RAQ)\]

\[\text{Sales Mix Variance} = BP \times (AQ - RAQ)\]

Sales Quantity Variance
(Revised Standard Sales) Less (Budgeted Sales)

\[\text{Sales Quantity Variance} = (BP \times RAQ) - (BP \times BQ)\]

\[\text{Sales Quantity Variance} = BP \times (RAQ - BQ)\]

Alternative Formula

\[\text{Alternative Formula} = \text{Average Budgeted Price per unit of Actual Mix} \times \left(\frac{\text{Actual Quantity}}{\text{Budgeted Quantity}}\right)\]

Market Size Variance

\[\text{Market Size Variance} = (\text{Budgeted Market Share \%} \times (\text{Actual Industry Sales Quantity} - \text{Budgeted Industry Sales Quantity})) \times \text{Average Budgeted Price per unit}\]

Market Share Variance

\[\text{Market Share Variance} = (\text{Actual Market Share \%} - \text{Budgeted Market Share \%}) \times (\text{Actual Industry Sales Quantity}) \times \text{Average Budgeted Price per unit}\]
Note:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BQ</td>
<td>Budgeted Sales Quantity</td>
</tr>
<tr>
<td>AQ</td>
<td>Actual Sales Quantity</td>
</tr>
<tr>
<td>RAQ</td>
<td>Revised Actual Sales Quantity</td>
</tr>
<tr>
<td>BP</td>
<td>Budgeted Selling Price per Unit</td>
</tr>
<tr>
<td>AP</td>
<td>Actual Selling Price per Unit</td>
</tr>
</tbody>
</table>

**Market Size Variance**

\[
\text{Budgeted Market Share} \% \times (\text{Actual Industry Sales Quantity in units} - \text{Budgeted Industry Sales Quantity in units}) \times (\text{Average Budgeted Price per unit})
\]

Or

\[
(\text{Budgeted Market Share} \% \times \text{Actual Industry Sales Quantity in units} - \text{Budgeted Market Share} \% \times \text{Budgeted Industry Sales Quantity in units}) \times (\text{Average Budgeted Price per unit})
\]

Or

\[
(\text{Required Sales Quantity in units} - \text{Total Budgeted Quantity in units}) \times (\text{Average Budgeted Price per unit})
\]

**Market Share Variance**

\[
(\text{Actual Market Share} \% - \text{Budgeted Market Share} \%) \times (\text{Actual Industry Sales Quantity in units}) \times (\text{Average Budgeted Price per unit})
\]

Or

\[
(\text{Actual Market Share} \% \times \text{Actual Industry Sales Quantity in units} - \text{Budgeted Market Share} \% \times \text{Actual Industry Sales Quantity in units}) \times (\text{Average Budgeted Price per unit})
\]

Or

\[
(\text{Total Actual Quantity in units} - \text{Required Sales Quantity in units}) \times (\text{Average Budgeted Price per unit})
\]

**Market Size Variance + Market Share Variance**

\[
(\text{Required Sales Quantity in units} - \text{Total Budgeted Quantity in units}) \times (\text{Average Budgeted Price per unit})
\]

\[
\text{Add}
\]

\[
(\text{Total Actual Quantity in units} - \text{Required Sales Quantity in units}) \times (\text{Average Budgeted Price per unit})
\]

\[
\text{Equals to}
\]

\[
(\text{Total Actual Quantity in units} - \text{Total Budgeted Quantity in units}) \times (\text{Average Budgeted Price per unit})
\]

**Sales Quantity Variance**
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### Sales Variances (Margin)

<table>
<thead>
<tr>
<th><strong>Sales Margin Variance</strong></th>
<th><strong>Sales Margin Price Variance</strong></th>
<th><strong>Sales Margin Volume Variance</strong></th>
<th><strong>Sales Margin Mix Variance</strong></th>
<th><strong>Sales Margin Quantity Variance</strong></th>
<th><strong>Market Size Variance</strong></th>
<th><strong>Market Share Variance</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>[(AQ × AM) – (BQ × BM)]</strong></td>
<td><strong>[(AM × AQ) – (BM × AQ)]</strong></td>
<td><strong>[(BM × AQ) – (BM × BQ)]</strong></td>
<td><strong>[(AQ × AM) – (RAQ × BM)]</strong></td>
<td><strong>[(RAQ × BM) – (BQ × BM)]</strong></td>
<td><strong>[(Actual Market Share % – Budgeted Market Share %) × (Budgeted Industry Sales Quantity in units) × (Average Budgeted Margin per unit)]</strong></td>
<td><strong>[(Actual Market Share % – Budgeted Market Share %) × (Actual Industry Sales Quantity in units) × (Average Budgeted Margin per unit)]</strong></td>
</tr>
</tbody>
</table>

**Alternative Formula**

- **Sales Margin Price Variance**
  - **[Total Actual Qty (units) × {Average Budgeted Margin per unit of Actual Mix Less Average Budgeted Margin per unit of Budgeted Mix}]**
- **Sales Margin Quantity Variance**
  - **[Average Budgeted Margin per unit of Budgeted Mix × (Total Actual Qty (units) Less Total Budgeted Qty (units))]**
Note:

- BQ = Budgeted Sales Quantity
- AQ = Actual Sales Quantity
- RAQ = Revised Actual Sales Quantity
  = Actual Quantity Sold Rewritten in Budgeted Proportion
- BM = Budgeted Margin
  = Budgeted price per Unit – Standard Cost per Unit
- AM = Actual Margin
  = Actual Sales Price per Unit – Standard Cost per Unit

### Market Size Variance

**Market Size Variance**

\[
\text{Market Size Variance} = \text{Budgeted Market Share} \% \times (\text{Actual Industry Sales Quantity in units} - \text{Budgeted Industry Sales Quantity in units}) \times (\text{Average Budgeted Margin per unit})
\]

Or

\[
\text{Market Size Variance} = (\text{Budgeted Market Share} \% \times \text{Actual Industry Sales Quantity in units} - \text{Budgeted Market Share} \% \times \text{Budgeted Industry Sales Quantity in units}) \times (\text{Average Budgeted Margin per unit})
\]

Or

\[
\text{Market Size Variance} = (\text{Required Sales Quantity in units} - \text{Total Budgeted Quantity in units}) \times (\text{Average Budgeted Margin per unit})
\]

### Market Share Variance

**Market Share Variance**

\[
\text{Market Share Variance} = (\text{Actual Market Share} \% - \text{Budgeted Market Share} \%) \times (\text{Actual Industry Sales Quantity in units}) \times (\text{Average Budgeted Margin per unit})
\]

Or

\[
\text{Market Share Variance} = (\text{Actual Market Share} \% \times \text{Actual Industry Sales Quantity in units} - \text{Budgeted Market Share} \% \times \text{Actual Industry Sales Quantity in units}) \times (\text{Average Budgeted Margin per unit})
\]

Or

\[
\text{Market Share Variance} = (\text{Total Actual Quantity in units} - \text{Required Sales Quantity in units}) \times (\text{Average Budgeted Margin per unit})
\]

### Market Size Variance + Market Share Variance

**Market Size Variance + Market Share Variance**

\[
\text{Market Size Variance + Market Share Variance} = (\text{Required Sales Quantity in units} - \text{Total Budgeted Quantity in units}) \times (\text{Average Budgeted Margin per unit})
\]

Add

\[
(\text{Total Actual Quantity in units} - \text{Required Sales Quantity in units}) \times (\text{Average Budgeted Margin per unit})
\]

Equals to

\[
(\text{Total Actual Quantity in units} - \text{Total Budgeted Quantity in units}) \times (\text{Average Budgeted Margin per unit})
\]

### Sales Margin Quantity Variance

Sales Margin Quantity Variance

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5.18 Advanced Management Accounting

Reconciliations (Budgeted / Standard Profit / Actual Profit)

Reconciliation Statement-I
Budgeted Profit to Actual Profit

<table>
<thead>
<tr>
<th>Budgeted Profit</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Budgeted Quantity × Budgeted Margin)</td>
<td></td>
</tr>
</tbody>
</table>

**Effect of Variances**

**Material Cost Variance**
- Material Price Variance
- Material Usage Variance
  - Material Mix Variance
  - Material Yield Variance

**Labour Cost Variance**
- Labour Rate Variance
- Labour Idle Time Variance
- Labour Efficiency Variance
  - Labour Mix Variance
  - Labour Sub-Efficiency Variance

**Variable Overhead Cost Variances**
- Variable Overhead Expenditure Variance
- Variable Overhead Efficiency Variance

**Fixed Overhead Cost Variances**
- Fixed Overhead Expenditure Variance
- Fixed Overhead Volume Variance
  - Fixed Overhead Capacity Variance
  - Fixed Overhead Efficiency Variance

**Sales Margin Variance**
- Sales Margin Price Variance
- Sales Margin Volume Variance
  - Sales Margin Mix Variance
  - Sales Margin Quantity Variance

**Actual Profit**

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Reconciliation Statement-II
Budgeted Profit to Actual Profit

Budgeted Profit
(Budgeted Quantity × Budgeted Margin)

Effect of Variances

Material Cost Variance
- Material Price Variance
- Material Usage Variance
  - Material Mix Variance
  - Material Yield Variance

Labour Cost Variance
- Labour Rate Variance
- Labour Idle Time Variance
- Labour Efficiency Variance
  - Labour Mix Variance
  - Labour Sub-Efficiency Variance

Variable Overhead Cost Variances
- Variable Overhead Expenditure Variance
- Variable Overhead Efficiency Variance

Fixed Overhead Cost Variances
- Fixed Overhead Expenditure Variance
- Fixed Overhead Volume Variance
  - Fixed Overhead Capacity Variance
- Fixed Overhead Efficiency Variance

Sales Contribution Variances
- Sales Contribution Price Variance
- Sales Contribution Volume Variance
  - Sales Contribution Mix Variance
  - Sales Contribution Quantity Variance

Actual Profit
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(1) Relation between Sales Margin Volume Variance & Sales Contribution Volume Variance

Sales Margin Volume Variance = Budgeted Margin Per Unit × (Actual Quantity − Budgeted Quantity)
Or
Sales Margin Volume Variance = [Standard (or Budgeted) Contribution Per Unit − Standard Fixed Overheads Per Unit] × (Actual Quantity − Budgeted Quantity)
Or
Sales Margin Volume Variance = [Standard Contribution Per Unit × (Actual Quantity − Budgeted Quantity)] − [Standard Fixed Overheads Per Unit × (Actual Quantity − Budgeted Quantity)]
Or
Sales Margin Volume Variance = Sales Contribution Volume Variance − Fixed Overhead Volume Variance
Or
Sales Contribution Volume Variance = Sales Margin Volume Variance + Fixed Overhead Volume Variance

Note: Production units equals to Sales units for both actual & budget.

(2) Fixed Overhead Volume Variance does not arise in a Marginal Costing system-Why?

Fixed Overhead Volume Variance does not arise in a Marginal Costing system. In an Absorption Costing system it stands for the value of the under-or over absorbed Fixed Overhead due to a change in production volume (Budgeted Vs Actual). When Marginal Costing is in use there is no Overhead Volume Variance, because Marginal Costing does not absorb Fixed Overhead. Fixed Overhead Expenditure Variance is the only variance for Fixed Overhead in a Marginal Costing system. It is calculated as in an Absorption Costing system. Sales Margin Volume Variance in Marginal Costing System also known as Sales Volume Contribution Variance. This variance calculates the Standard Contribution gained or lost as a result of an increase or decrease in sales volume.

(3) Sales Contribution Variance Formulas

Sales Contribution Volume Variance = [Standard Contribution Per Unit × (Actual Quantity − Budgeted Quantity)]
Sales Contribution Mix Variance = [Standard Contribution Per Unit × (Actual Quantity − Revised Actual Quantity)]
Sales Contribution Quantity Variance = [Standard Contribution Per Unit × (Revised Actual Quantity − Budgeted Quantity)]

(4) Relation between Sales Price Variance & Sales Contribution Price Variance

Sales Price Variance is equal to Sales Contribution Price Variance.
(This is because, for the actual quantity sold, standard cost remaining constant, change in selling price will have equal impact on turnover and contribution)

(5) Relation between Sales Volume Variance & Sales Contribution Volume Variance

Sales Contribution Volume Variance = Sales Volume Variance × Budgeted PV Ratio
Reconciliation Statement-III
Standard Profit to Actual Profit

Standard Profit
(Actual Quantity × Budgeted Margin)

Effect of Variances
Material Cost Variance
  Material Price Variance
  Material Usage Variance
    Material Mix Variance
    Material Yield Variance
Labour Cost Variance
  Labour Rate Variance
  Labour Idle Time Variance
  Labour Efficiency Variance
    Labour Mix Variance
    Labour Sub-Efficiency Variance
Variable Overhead Cost Variances
  Variable Overhead Expenditure Variance
  Variable Overhead Efficiency Variance
Fixed Overhead Cost Variances
  Fixed Overhead Expenditure Variance
  Fixed Overhead Volume Variance
    Fixed Overhead Capacity Variance
    Fixed Overhead Efficiency Variance
Sales Margin Variance
  Sales Margin Price Variance
  Sales Margin Volume Variance
    Sales Margin Mix Variance
    Sales Margin Quantity Variance
Actual Profit
Variance Analysis

Question-1
Describe three distinct groups of variances that arise in standard costing.

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

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

Question-2
How are cost variances disposed off in a standard costing system? Explain.

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

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

Question-3
“Standard costing variances centre around comparison of actual Performance with the standard and the standards or plans are normally based on the environment anticipated when
the targets are set and if the current environment is different from that anticipated, such analysis cannot measure managerial performance”. Comment on the statement and how will you deal with the situation with reference to material and labour variances.

Answer

The statement given in the question highlights practical difficulties faced by our industries today.

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

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

Material Variances:

In the case of Material Purchase Price Variance, suppose the Standard Price of Raw Material determined was ₹ 5.00 per unit, the General Market Price per unit at the time of purchase was ₹ 5.20 and Actual Price paid per unit was ₹ 5.18 on the purchase of say 10,000 units of Raw Material.

In this case the variances to be computed should be:

Uncontrollable Material Purchase Price Planning Variance:

\[
= (\text{Standard Price p.u.} - \text{General Market Price p.u.}) \times \text{Actual Quantity Purchased}
\]

\[
= (₹ 5.00 - ₹ 5.20) \times 10,000 \text{ units}
\]

\[
= ₹2,000 \text{ (A)}
\]

Controllable Material Purchase Price Efficiency Variance:

\[
= (\text{General Market Price p.u.} - \text{Actual Price Paid p.u.}) \times \text{Actual Quantity Purchased}
\]

\[
= (₹ 5.20 - 5.18) \times 10,000 \text{ units}
\]

\[
= ₹200 \text{ (F)}
\]

In the case of Material Usage Variance, suppose the Standard Quantity per unit be 5 Kgs., Actual Production units be 250 and Actual Quantity of Material used is 1,450 kgs. Standard Cost of Material per Kg. was ₹1. Because of shortage of Skilled Labour it was felt necessary to use Unskilled Labour and that increased Material Usage by 20%. The variances to be computed to deal with the current environmental conditions will be:
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Uncontrollable Material Usage Planning Variances:
\[ \text{Uncontrollable Material Usage Planning Variances:} = (\text{Original Std. Quantity in Kgs.} - \text{Revised Std. Quantity in Kgs.}) \times \text{Standard Price per Kg.} \]
\[ = (1,250 \text{ Kgs.} - 1,500 \text{ Kgs}) \times 1 \]
\[ = ₹ 250 (A) \]

Controllable Material Usage Efficiency Variance:
\[ \text{Controllable Material Usage Efficiency Variance:} = (\text{Revised Standard Quantity in Kgs.} - \text{Actual Quantity Used in Kgs.}) \times \text{Std. Price per Kg.} \]
\[ = (1,500 \text{ Kgs.} - 1,450 \text{ Kgs.}) \times 1 \]
\[ = ₹ 50 (F) \]

Labour Variances:
Like Material Variances, here also Labour Efficiency and Wage Rate Variances should also be adjusted to reflect changes in environmental conditions that prevailed during the period. The Labour Efficiency Variances would be equivalent to the following two variances.

Uncontrollable Labour Efficiency Planning Variance

Controllable Labour Efficiency Variance

The above variances would arise when Unskilled Labour is substituted for Skilled Labour.
Similarly, one Uncontrollable and other Controllable Variance would arise in the case of Wage Rate Variance as well under current environmental conditions.

Question-4

Explain- Whether a production manager should be accountable for direct labour and direct materials cost variances.

\[ \text{Answer} \]

Performance should be measured against the element of direct cost which the manager can control. For example,
The purchase manager is responsible for the price of raw materials to be purchased at the time of purchase.
The production manager is responsible for the amount of raw material used, and this responsibility exercised when the materials are used in production. However, he/she may not be able to influences the cost of material, the quality of the material, the cost of labour and the quality of labour.

Question-5

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

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

Question-6

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

Answer

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

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

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

(i) the amount of variance
(ii) the factors or causes of their occurrence
(iii) the responsibility to be laid on executives and departments and
Mere calculation and analysis of variances is of no use. The success of variance analysis depends upon how quickly and effectively the corrective actions can be taken on the analysed variances. In fact variance gives information. The manager needs to act on the information provided for taking corrective action. Information is the means and action taken on it is the end. In other words, the calculation of variances in standard costing is not an end in itself, but a means to an end.

Single Plan/ Partial Plan

Question-7

State the features of Partial plan of Standard Cost Accounting procedure.

Answer

Features of Partial Plan of Standard Cost Accounting procedure:

Standard cost operations can be recorded in the books of account by using partial plan,

Features of partial plan of standard costing procedure are as follows:

(i) Partial plan system uses current standards in which the inventory will be valued at current standard cost figure.

(ii) Under this method WIP account is charged at the actual cost of production for the month and is credited with the standard cost of the month's production of finished product.

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

(iv) The analysis of variance is done after the end of the month.
Computation of Material Variances

Problem-1

The standard material cost for a normal mix of one tonne of chemical Xing based on:

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Usage</th>
<th>Price per Kg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>240 Kg.</td>
<td>₹ 6</td>
</tr>
<tr>
<td>B</td>
<td>400 Kg.</td>
<td>₹12</td>
</tr>
<tr>
<td>C</td>
<td>640 Kg.</td>
<td>₹10</td>
</tr>
</tbody>
</table>

During a month, 6.25 tonnes of X were produced from:

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Consumption (Tonnes)</th>
<th>Cost (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.6</td>
<td>11,200</td>
</tr>
<tr>
<td>B</td>
<td>2.4</td>
<td>30,000</td>
</tr>
<tr>
<td>C</td>
<td>4.5</td>
<td>47,250</td>
</tr>
</tbody>
</table>

Required

Analyse the variances.

Solution

BASIC WORKINGS

Statement Showing “Standard and Actual Cost”

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Std. Qty.</th>
<th>Std. Price per tonne</th>
<th>Std. Cost</th>
<th>Actual Qty. (tonne)</th>
<th>Actual Price per tonne</th>
<th>Actual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.5 tonnes</td>
<td>₹6,000</td>
<td>₹9,000</td>
<td>1.6t</td>
<td>₹7,000</td>
<td>₹11,200</td>
</tr>
<tr>
<td>B</td>
<td>2.5 tonnes</td>
<td>₹12,000</td>
<td>₹30,000</td>
<td>2.4t</td>
<td>₹12,500</td>
<td>₹30,000</td>
</tr>
</tbody>
</table>
## Advanced Management Accounting

### Statement Showing “Standard Cost of Actual Quantity”

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Std. Price per tonne</th>
<th>Actual Qty.</th>
<th>Std. Cost of Actual Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SP</td>
<td>AQ</td>
<td>AQ x SP</td>
</tr>
<tr>
<td>A</td>
<td>₹6,000</td>
<td>1.6 tonnes</td>
<td>₹9,600</td>
</tr>
<tr>
<td>B</td>
<td>₹12,000</td>
<td>2.4 tonnes</td>
<td>₹28,800</td>
</tr>
<tr>
<td>C</td>
<td>₹10,000</td>
<td>4.5 tonnes</td>
<td>₹45,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>8.5 tonnes</td>
<td>₹83,400</td>
</tr>
</tbody>
</table>

### COMPUTATION OF VARIANCES

**Material Cost Variance**

\[
\text{Material Cost Variance} = \text{Standard Cost} - \text{Actual Cost} = \text{SQ} \times \text{SP} - \text{AQ} \times \text{AP}
\]

(A) \[= ₹9,000 - ₹11,200 = ₹2,200 (A)\]

(B) \[= ₹30,000 - ₹30,000 = ₹0\]

(C) \[= ₹40,000 - ₹47,250 = ₹7,250 (A)\]

**Total** \[= ₹2,200 (A) + ₹0 + ₹7,250 (A) = ₹9,450 (A)\]

**Material Price Variance**

\[
\text{Material Price Variance} = \text{Standard Cost of Actual Quantity} - \text{Actual Cost} = \text{AQ} \times \text{SP} - \text{AQ} \times \text{AP}
\]

\[
\text{Or}
\]

\[= \text{AQ} \times (\text{SP} - \text{AP})
\]

(A) \[= 1.6 \text{ tonnes} \times (₹6,000 - ₹7,000) = ₹1,600 (A)\]

(B) \[= 2.4 \text{ tonnes} \times (₹12,000 - ₹12,500) = ₹1,200 (A)\]
Standard Costing 5.29

\[(C) = 4.5 \text{ tonnes} \times (\text{₹} 10,000 – \text{₹} 10,500) \]
\[= \text{₹} 2,250 \ (A)\]
Total \[= \text{₹} 1,600 \ (A) + \text{₹} 1,200 \ (A) + \text{₹} 2,250 \ (A)\]
\[= \text{₹} 5,050 \ (A)\]

**Material Usage Variance**
\[\text{Material Usage Variance} = \text{Standard Cost of Standard Quantity for Actual Output} – \text{Standard Cost of Actual Quantity}\]
\[= SQ \times SP – AQ \times SP\]
\[\text{Or}\]
\[= SP \times (SQ – AQ)\]
\[\text{(A)} = \text{₹} 6,000 \times (1.5 \text{ tonnes} – 1.6 \text{ tonnes})\]
\[= \text{₹} 600 \ (A)\]
\[\text{(B)} = \text{₹} 12,000 \times (2.5 \text{ tonnes} – 2.4 \text{ tonnes})\]
\[= \text{₹} 1,200 \ (F)\]
\[\text{(C)} = \text{₹} 10,000 \times (4.0 \text{ tonnes} – 4.5 \text{ tonnes})\]
\[= \text{₹} 5,000 \ (A)\]
Total \[= \text{₹} 600 \ (A) + \text{₹} 1,200 \ (F) + \text{₹} 5,000 \ (A)\]
\[= \text{₹} 4,400 \ (A)\]

**Material Mix Variance**
\[\text{Material Mix Variance} = \text{Total Actual Quantity (units)} \times (\text{Average Standard Price per unit of Standard Mix} – \text{Average Standard Price per unit of Actual Mix})\]
\[= 8.5 \text{ tonnes} \times \left( \frac{\text{₹} 79,000}{8 \text{ tonnes}} – \frac{\text{₹} 83,400}{8.5 \text{ tonnes}} \right)\]
\[= \text{₹} 537.5 \ (F)\]

**Material Yield Variance**
\[\text{Material Yield Variance} = \text{Average Standard Price per unit of Standard Mix} \times [\text{Total Standard Quantity (units)} – \text{Total Actual Quantity (units)}]\]
\[= \left( \frac{\text{₹} 79,000}{8 \text{ tonnes}} \right) \times (8 \text{ tonnes} – 8.5 \text{ tonnes})\]
\[= \text{₹} 4,937.5 \ (A)\]

**Problem-2**

The standard cost of a certain chemical mixture is as under:

40% of Material A @ ₹ 30 per kg

60% of Material B @ ₹ 40 per kg

A standard loss of 10% of input is expected in production. The following actual cost data is given for the period.

350 kg Material – A at a cost of ₹ 25
5.30 Advanced Management Accounting

400 kg Material – B at a cost of ₹ 45
Actual weight produced is 630 kg.

Required
Calculate the following variances raw material wise and indicate whether they are favorable (F) or adverse (A):
(i) Cost variance
(ii) Price variance
(iii) Mix variance
(iv) Yield variance

Solution

BASIC CALCULATIONS
Actual Output produced is 630 Kg. The Standard Quantity of Material required for 630 Kg. of output is 700 Kg. \[ \left( \frac{630\text{Kg.}}{90} \times 100 \right) \]

Statement Showing “Computation of Standard Cost / Actual Cost / Revised Actual Quantity”

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard Cost</th>
<th>Actual Cost</th>
<th>Revised Actual Quantity [RAQ] (Kg.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity [SQ] (Kg.)</td>
<td>Price [SP] (₹)</td>
<td>Amount [SQ × SP] (₹)</td>
</tr>
<tr>
<td>A</td>
<td>280 (40% of 700 Kg.)</td>
<td>30</td>
<td>8,400</td>
</tr>
<tr>
<td>B</td>
<td>420 (60% of 700 Kg.)</td>
<td>40</td>
<td>16,800</td>
</tr>
<tr>
<td>Total</td>
<td>700</td>
<td>25,200</td>
<td>750</td>
</tr>
</tbody>
</table>

Note:
SQ = Standard Quantity = Expected Consumption for Actual Output
AQ = Actual Quantity of Material Consumed
RAQ = Revised Actual Quantity = Actual Quantity Rewritten in Standard Proportion
SP = Standard Price per Unit
AP = Actual Price per Unit

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COMPUTATION OF VARIANCES

Material Cost Variance

\[ \text{Material Cost Variance} = SQ \times SP - AQ \times AP \]

A = 280 Kg. × ₹30 – 350 Kg. × ₹25
= ₹350 (A)

B = 420 Kg. × ₹40 – 400 Kg. × ₹45
= ₹1,200 (A)

Total = ₹350 (A) + ₹1,200 (A)
= ₹1,550 (A)

Material Price Variance

\[ \text{Material Price Variance} = AQ \times (SP - AP) \]

A = 350 Kg. × (₹30 – ₹25)
= ₹1,750 (F)

B = 400 Kg. × (₹40 – ₹45)
= ₹2,000 (A)

Total = ₹1,750 (F) + ₹2,000 (A)
= ₹250 (A)

Material Mix Variance

\[ \text{Material Mix Variance} = SP \times (RAQ - AQ) \]

A = ₹30 × (300 Kg – 350 Kg)
= ₹1,500 (A)

B = ₹40 × (450 Kg. – 400 Kg.)
= ₹2,000 (F)

Total = ₹1,500 (A) + ₹2,000 (F)
= ₹500 (F)

Material Yield Variance

\[ \text{Material Yield Variance} = SP \times (SQ - RAQ) \]

A = ₹30 × (280 Kg. – 300 Kg)
= ₹600 (A)

B = ₹40 × (420 Kg. – 450 Kg.)
= ₹1,200 (A)

Total = ₹600 (A) + ₹1,200 (A)
= ₹1,800 (A)

Computation of Labour Variances

Problem-3

The following information relates to the labour element of X Ltd.
5.32 Advanced Management Accounting

<table>
<thead>
<tr>
<th>Type of labour</th>
<th>Skilled</th>
<th>Semi-skilled</th>
<th>Unskilled</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of workers in the standard gang</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Standard rate per hour (₹)</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Number of workers in actual gang</td>
<td></td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Actual rate per hour (₹)</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

In a 40 hour week, the gang produced 270 standard hours. The actual number of semi-skilled workers is two times the actual number of unskilled workers.

The rate variance of semi-skilled workers is ₹160 (F).

**Required**

(i) The number of workers in each category

(ii) Total gang variance

(iii) Total sub-efficiency variance

(iv) Total labour rate variance

*Indicate if the variances are Favourable (F) or Adverse (A or U).*

**Solution**

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

<table>
<thead>
<tr>
<th>Category</th>
<th>No. of Workers</th>
<th>Actual Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skilled</td>
<td>3 (120 hrs.)</td>
<td>120 (Balancing Figure)</td>
</tr>
<tr>
<td>Semi-Skilled</td>
<td>4 (160 hrs.)</td>
<td>160 (Working Note)</td>
</tr>
<tr>
<td>Un-Skilled</td>
<td>2 (80 hrs.)</td>
<td>80 (160 hrs.)</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>360*</td>
</tr>
</tbody>
</table>

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

\[
\text{Total Gang Variance} = \text{Total Actual Time Worked (hours)} \times \left\{ \frac{\text{Average Standard Rate per hour of Standard Gang}}{\text{Less Average Standard Rate per hour of Actual Gang}} \right\}
\]

@**on the basis of hours worked**

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

\[
= \text{₹120 (F)}
\]

**Alternate Formula**


Or = Revised Actual Hours \times Standard Rate – Actual Hours \times Standard Rate

Or = Standard Rate \times (Revised Actual Hours - Actual Hours)

Skilled Workers = ₹6 \times (160 \text{ hrs.} - 120 \text{ hrs})

= ₹240 (F)

Semi-Skilled = ₹3 \times (120 \text{ hrs.} - 160 \text{ hrs})

= ₹120 (A)

Skilled Workers = ₹1 \times (80 \text{ hrs.} - 80 \text{ hrs})

= ₹0

Total = ₹240 (F) + ₹120 (A) + ₹0

= ₹120 (F)

(iii) **Total Sub- Efficiency Variance**

\[
\text{Total Sub- Efficiency Variance} = \text{Average Standard Rate per hour of Standard Gang} \times \left\{ \frac{\text{Total Standard Time} (\text{hours})}{\text{Less Total Actual Time Worked (hours)}} \right\}
\]

\[
= \left( \frac{\text{₹1,050}}{270 \text{ hrs.}} \right) \times (270 \text{ hrs.} - 360 \text{ hrs.})
\]

\[
= \text{₹350 (A)}
\]

**Alternate Formula**

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

Or = Standard Rate x (Standard Hours – Revised Actual Hours)

Skilled Workers = \( 6 \times (120 \text{ hrs.} – 160 \text{ hrs.}) \)
= \( \text{₹} 240 \text{ (A)} \)

Semi-Skilled = \( 3 \times (90 \text{ hrs.} – 120 \text{ hrs.}) \)
= \( \text{₹} 90 \text{ (A)} \)

Skilled Workers = \( 1 \times (60 \text{ hrs.} – 80 \text{ hrs.}) \)
= \( \text{₹} 20 \text{ (A)} \)

Total = \( \text{₹} 240 \text{ (A)} + \text{₹} 90 \text{ (A)} + \text{₹} 20 \text{ (A)} \)
= \( \text{₹} 350 \text{ (A)} \)

(iv) Labour Rate Variance

= Standard Cost of Actual Time – Actual Cost

Or = Standard Rate x Actual Hours – Actual Rate x Actual Hours

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

Skilled Workers = \( 120 \text{ hrs.} \times (\text{₹} 6 – \text{₹} 7) \)
= \( \text{₹} 120 \text{ (A)} \)

Semi- Skilled = \( 160 \text{ hrs.} \times (\text{₹} 3 – \text{₹} 2) \)
= \( \text{₹} 160 \text{ (F)} \)

Skilled Workers = \( 80 \text{ hrs.} \times (\text{₹} 1 – \text{₹} 2) \)
= \( \text{₹} 80 \text{ (A)} \)

Total = \( \text{₹} 120 \text{ (A)} + \text{₹} 160 \text{ (F)} + \text{₹} 80 \text{ (A)} \)
= \( \text{₹} 40 \text{ (A)} \)

WORKING NOTE

(i) Computation of ‘Standard Hours’ Category Wise

<table>
<thead>
<tr>
<th>Category</th>
<th>No. of Workers</th>
<th>Standard Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skilled</td>
<td>4</td>
<td>120 (( \frac{270 \text{ hrs.} \times 4 \text{ workers}}{9 \text{ workers}} ))</td>
</tr>
</tbody>
</table>
### (ii) Computation of ‘Actual Hours’ Category Wise

**Semi-Skilled Workers**

\[
\text{Labour Rate Variance} = \text{Standard Cost of Actual Time} - \text{Actual Cost}
\]

\[
\text{Or} = \text{Standard Rate} \times \text{Actual Hours} - \text{Actual Rate} \times \text{Actual Hours}
\]

\[
\text{Or} = \text{Actual Hours} \times (\text{Standard Rate} - \text{Actual Rate})
\]

\[\text{₹ 160 (F)} = \text{Actual Hours} \times (3 - 2)\]

\[\Rightarrow \text{Actual Hours} = 160 \text{ Hours}\]

### (iii) Statement Showing “Standard & Actual Cost”

<table>
<thead>
<tr>
<th>Category</th>
<th>Standard Cost</th>
<th>Actual Cost</th>
<th>Revised Actual Hrs. (In Std. Proportion)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hrs. Rate Amt.</td>
<td>Hrs. Rate Amt.</td>
<td></td>
</tr>
<tr>
<td>Skilled</td>
<td>120 6 720</td>
<td>120 7 840</td>
<td>160 (360hrs. x 120hrs. / 270hrs.)</td>
</tr>
<tr>
<td>Semi-Skilled</td>
<td>90 3 270</td>
<td>160 2 320</td>
<td>120 (360hrs. x 90hrs. / 270hrs.)</td>
</tr>
<tr>
<td>Un-Skilled</td>
<td>60 1 60</td>
<td>80 2 160</td>
<td>80 (360hrs. x 60hrs. / 270hrs.)</td>
</tr>
<tr>
<td>Total</td>
<td>270 1,050</td>
<td>360 1,320</td>
<td>360</td>
</tr>
</tbody>
</table>
Computation of Overhead Variances

Problem-4

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual output</td>
<td>= 9,000 units</td>
</tr>
<tr>
<td>Direct wages paid</td>
<td>= 1,10,000 hours at ₹ 22 per hour, of which 5,000 hours, being idle time, were not recorded in production</td>
</tr>
<tr>
<td>Standard hours</td>
<td>= 10 hours per unit</td>
</tr>
<tr>
<td>Labour efficiency variance</td>
<td>= ₹ 3,75,000 (A)</td>
</tr>
<tr>
<td>Standard variable Overhead</td>
<td>= ₹ 150 per unit</td>
</tr>
<tr>
<td>Actual variable Overhead</td>
<td>= ₹ 16,00,000</td>
</tr>
</tbody>
</table>

Required

(i) Calculate idle time variance
(ii) Calculate total variable overhead variance
(iii) Calculate variable overhead expenditure variance
(iv) Calculate variable overhead efficiency variance.

Solution

BASIC WORKING

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Output</td>
<td>9,000 units</td>
</tr>
<tr>
<td>Idle Time</td>
<td>5,000 hrs</td>
</tr>
<tr>
<td>Production Time (Actual)</td>
<td>1,05,000 hrs</td>
</tr>
<tr>
<td>Standard Hours for Actual Production</td>
<td>90,000 hours</td>
</tr>
<tr>
<td>(10 hours / unit × 9,000 units)</td>
<td></td>
</tr>
<tr>
<td>Labour Efficiency Variance</td>
<td>= Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time</td>
</tr>
<tr>
<td></td>
<td>Or</td>
</tr>
<tr>
<td></td>
<td>= Std. Rate × (Std. Hours – Actual Hours Worked)</td>
</tr>
<tr>
<td>⇒ 3,75,000 (A)</td>
<td></td>
</tr>
<tr>
<td>⇒ Std. Rate</td>
<td>= ₹ 25</td>
</tr>
</tbody>
</table>
Standard Variable Overhead = ₹ 150 / unit
Standard Hours = 10 hrs / unit
Standard Variable Overhead Rate / hr = ₹ 150 / 10 hrs
= ₹ 15 / hr

COMPUTATION OF REQUIREMENTS

(i) **Idle Time Variance**
= Standard Rate per Hour × Actual Idle Hours
= ₹25 × 5,000 hrs
= ₹1,25,000 (A)

(ii) **Total Variable Overhead Variance**
= Standard Variable Overhead for Production – Actual Variable Overheads
= ₹15 × (10 hrs × 9,000 units) – ₹16,00,000
= ₹13,50,000 – ₹16,00,000
= ₹2,50,000 (A)

(iii) **Variable Overhead Expenditure Variance**
= Budgeted Overheads for Actual Hours Worked – Actual Variable Overheads
= ₹15 × 1,05,000 hrs – ₹16,00,000
= ₹15,75,000 – ₹16,00,000
= ₹25,000 (A)

(iv) **Variable Overhead Efficiency Variance**
= Standard Variable Overhead for Output – Budgeted Overheads for Actual Hours
= Standard Rate per hour × (Standard Hours for actual output – Actual Hours Worked)
= ₹15 × (90,000 hrs – 1,05,000 hrs)
= ₹2,25,000 (A)

Overheads can also be affected by Idle time. It is usually assume that overhead expenditure is incurred in active hours only.

**Problem-5**

In a manufacturing co. the standard units of production of the year were fixed at 1,20,000 units and overhead expenditures were estimated to be:
### Advanced Management Accounting

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed</td>
<td>₹ 12,000</td>
<td>Variable</td>
</tr>
<tr>
<td>Semi-Variable</td>
<td>₹ 1,800</td>
<td></td>
</tr>
</tbody>
</table>

Actual production during April of the year was 8,000 units. Each month has 20 working days. During the month there was one statutory holiday. The actual overheads amounted to:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed</td>
<td>₹ 1,190</td>
<td>Variable</td>
</tr>
<tr>
<td>Semi-variable</td>
<td>₹ 192</td>
<td></td>
</tr>
</tbody>
</table>

Semi-variable charges are considered to include 60 per cent expenses of fixed nature and 40 per cent of variable character.

**Required**

(a) Calculate Overhead Cost Variance
(b) Calculate Fixed Overhead Cost Variance
(c) Calculate Variable Overhead Cost Variance
(d) Calculate Fixed Overhead Volume Variance
(e) Calculate Fixed Overhead Expenditure Variance
(f) Calculate Calendar Variance.

### Solution

**COMPUTATION OF VARIANCES**

**Overhead Cost Variance**

\[
\text{Overhead Cost Variance} = \text{Absorbed Overheads} – \text{Actual Overheads} \\
= (₹ 872.00 + ₹ 448.00) – (₹ 1,305.20 + ₹ 556.80) \\
= ₹ 542.00 (A)
\]

**Variable Overhead Cost Variance**

\[
\text{Variable Overhead Cost Variance} = \text{Standard Variable Overheads for Production} – \text{Actual Variable Overheads} \\
= ₹ 448.00 – ₹ 556.80 \\
= ₹ 108.80 (A)
\]

**Fixed Overhead Cost Variance**

\[
\text{Fixed Overhead Cost Variance} = \text{Absorbed Fixed Overheads} – \text{Actual Fixed Overheads} \\
= ₹ 872.00 – ₹ 1,305.20 \\
= ₹ 433.20 (A)
\]

**Fixed Overhead Volume Variance**

\[
\text{Fixed Overhead Volume Variance} = \text{Absorbed Fixed Overheads} – \text{Budgeted Fixed Overheads} \\
= ₹ 872.00 – ₹ 1,090.00 \\
= ₹ 218.00 (A)
\]
**Fixed Overhead Expenditure Variance**

\[
\text{Fixed Overhead Expenditure Variance} = \text{Budgeted Fixed Overheads} - \text{Actual Fixed Overheads}
\]

\[
= \, ₹ 0.109 \times 10,000 \text{ units} - ₹ 1,305.20
\]

\[
= \, ₹ 215.20 \text{ (A)}
\]

**Calendar Variance**

\[
\text{Calendar Variance} = \text{Possible Fixed Overheads} - \text{Budgeted Fixed Overheads}
\]

\[
= \, ₹ 1,035.50 - ₹ 1,090.00
\]

\[
= \, ₹ 54.50 \text{ (A)}
\]

**WORKING NOTE**

<table>
<thead>
<tr>
<th>Description</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Overheads = \frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Output}}</td>
<td>$\frac{₹12,000}{1,20,000\text{units}} = ₹0.100$</td>
</tr>
<tr>
<td>Fixed Overheads element in <em>Semi-Variable</em> Overheads i.e. 60% of ₹1,800</td>
<td>₹1,080</td>
</tr>
<tr>
<td>Fixed Overheads = \frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Output}}</td>
<td>$\frac{₹1,080}{1,20,000\text{units}} = ₹0.009$</td>
</tr>
<tr>
<td>Standard Rate of Absorption of Fixed Overheads <em>per unit</em> (₹0.100 + ₹0.009)</td>
<td>₹0.109</td>
</tr>
<tr>
<td>Fixed Overheads Absorbed on 8,000 units @ ₹0.109</td>
<td>₹872</td>
</tr>
<tr>
<td>Budgeted Variable Overheads</td>
<td>₹6,000</td>
</tr>
<tr>
<td>Add: Variable element in Semi-Variable Overheads 40% of ₹1,800</td>
<td>₹720</td>
</tr>
<tr>
<td>Total Budgeted Variable Overheads</td>
<td>₹6,720</td>
</tr>
<tr>
<td>Standard Variable Cost <em>per unit</em> = \frac{\text{Budgeted Variable Overheads}}{\text{Budgeted Output}}</td>
<td>$\frac{₹6,720}{1,20,000\text{units}} = ₹0.056$</td>
</tr>
<tr>
<td>Standard Variable Overheads for 8,000 units @ ₹0.056</td>
<td>₹448</td>
</tr>
<tr>
<td>Budgeted Annual Fixed Overheads (₹12,000 + 60% of ₹1,800)</td>
<td>₹13,080</td>
</tr>
<tr>
<td>Possible Fixed Overheads = \frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Days}} \times \text{Actual Days}</td>
<td>₹1,035.50</td>
</tr>
<tr>
<td>Possible Fixed Overheads = \left[ \frac{₹1,090}{20\text{Days}} \right] \times 19\text{Days}</td>
<td></td>
</tr>
<tr>
<td>Actual Fixed Overheads (₹1,190 + 60% of ₹192)</td>
<td>₹1,305.20</td>
</tr>
<tr>
<td>Actual Variable Overheads (₹480 + 40% of ₹192)</td>
<td>₹556.80</td>
</tr>
</tbody>
</table>
Problem-6

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

Budgeted:

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of working days</td>
<td>24</td>
</tr>
<tr>
<td>Working hours per day</td>
<td>8</td>
</tr>
<tr>
<td>No. of direct workers</td>
<td>150</td>
</tr>
<tr>
<td>Efficiency</td>
<td>One standard hour per clock hour</td>
</tr>
<tr>
<td>Down time</td>
<td>10%</td>
</tr>
<tr>
<td>Overheads</td>
<td></td>
</tr>
<tr>
<td>Fixed</td>
<td>₹ 75,400</td>
</tr>
<tr>
<td>Variable</td>
<td>₹ 90,720</td>
</tr>
</tbody>
</table>

The actual data for the month of August 2013 are as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overheads</td>
<td></td>
</tr>
<tr>
<td>Fixed</td>
<td>₹ 78,800</td>
</tr>
<tr>
<td>Variable</td>
<td>₹ 70,870</td>
</tr>
<tr>
<td>Net operator hours worked</td>
<td>20,500</td>
</tr>
<tr>
<td>Standard hours produced</td>
<td>22,550</td>
</tr>
</tbody>
</table>

There was a special holiday in August 2013.

Required

(i) Calculate efficiency, activity, calendar and standard capacity usages ratio.
(ii) Calculate all the relevant fixed overhead variances.
(iii) Calculate variable overheads expenditure and efficiency variance.

Solution

**BASIC WORKING**

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Hours</td>
<td>(24 Days × 8 Hours × 150 Workers) 28,800 Hours</td>
</tr>
<tr>
<td>Budgeted Hours</td>
<td>(28,800 Hours less 10%) 25,920 Hours</td>
</tr>
<tr>
<td>Actual Hours (given)</td>
<td>20,500 Hours</td>
</tr>
<tr>
<td>Standard Hours (produced)</td>
<td>22,550 Hours</td>
</tr>
<tr>
<td>Budgeted Working Days</td>
<td>24 Days</td>
</tr>
<tr>
<td>Actual Working Days</td>
<td>23 Days</td>
</tr>
</tbody>
</table>
Standard Costing 5.41

Standard Rate (Fixed Overheads) per hour \( \frac{\text{₹75,400}}{25,920 \text{ hrs.}} \) \( \text₹ 2.908… \)

Standard Rate (Variable Overheads) per hour \( \frac{\text{₹90,720}}{25,920 \text{ hrs.}} \) \( \text₹ 3.5 \)

RATIOS

Efficiency Ratio

\[
\text{Efficiency Ratio} = \frac{\text{Standard Hours}}{\text{Actual Hours}} \times 100
\]

\[
= \frac{22,550 \text{ Hours}}{20,500 \text{ Hours}} \times 100
\]

= 110%

Activity Ratio

\[
\text{Activity Ratio} = \frac{\text{Standard Hours}}{\text{Budgeted Hours}} \times 100
\]

\[
= \frac{22,550 \text{ Hours}}{25,920 \text{ Hours}} \times 100
\]

= 87%

Calendar Ratio

\[
\text{Calendar Ratio} = \frac{\text{Available Working Days}}{\text{Budgeted Working Days}} \times 100
\]

\[
= \frac{23 \text{ Days}}{24 \text{ Days}} \times 100
\]

= 95.83%

Standard Capacity Usage Ratio

\[
\text{Standard Capacity Usage Ratio} = \frac{\text{Budgeted Hours}}{\text{Max. Possible Hours in the Budgeted Period}} \times 100
\]

\[
= \frac{25,920 \text{ Hours}}{28,800 \text{ Hours}} \times 100
\]

= 90%

COMPUTATION OF VARIANCES

(i) Fixed Overhead Variances

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>₹ 2.908… × 22,550 hrs.</td>
<td>25,920 hrs. × ₹ 2.908…</td>
<td>20,500 hrs. × ₹ 2.908…</td>
<td>₹ 2.908… × 20,500 Hrs</td>
<td>₹ 75,400 × ( \frac{23\text{Days}}{24\text{Days}} )</td>
</tr>
<tr>
<td>₹ 65,597</td>
<td>₹ 75,400</td>
<td>₹ 78,800</td>
<td>₹ 59,633</td>
<td>₹ 72,258</td>
</tr>
</tbody>
</table>

* ₹ 78,800 / 20,500 hrs.
### Fixed Overhead Cost Variance

\[ \text{Fixed Overhead Cost Variance} = \text{Absorbed Fixed Overheads} - \text{Actual Fixed Overheads} \]

\[ = ₹ 65,597 - ₹ 78,800 \]

\[ = ₹ 13,203 \text{ (A)} \]

### Fixed Overhead Expenditure Variance

\[ \text{Fixed Overhead Expenditure Variance} = \text{Budgeted Fixed Overheads} - \text{Actual Fixed Overheads} \]

\[ = ₹ 75,400 - ₹ 78,800 \]

\[ = ₹ 3,400 \text{ (A)} \]

### Fixed Overhead Volume Variance

\[ \text{Fixed Overhead Volume Variance} = \text{Absorbed Fixed Overheads} - \text{Budgeted Fixed Overheads} \]

\[ = ₹ 65,597 - ₹ 75,400 \]

\[ = ₹ 9,803 \text{ (A)} \]

### Fixed Overhead Capacity Variance

\[ \text{Fixed Overhead Capacity Variance} = \text{Budgeted Fixed Overheads for Actual Hours} - \text{Possible Fixed Overheads} \]

\[ = ₹ 59,633 - ₹ 72,258 \]

\[ = ₹ 12,625 \text{ (A)} \]

### Fixed Overhead Calendar Variance

\[ \text{Fixed Overhead Calendar Variance} = \text{Possible Fixed Overheads} - \text{Budgeted Fixed Overheads} \]

\[ = ₹ 72,258 - ₹ 75,400 \]

\[ = ₹ 3,142 \text{ (A)} \]

### Fixed Overhead Efficiency Variance

\[ \text{Fixed Overhead Efficiency Variance} = \text{Absorbed Fixed Overheads} - \text{Budgeted Fixed Overheads for Actual hours} \]

\[ = ₹ 65,597 - ₹ 59,633 \]

\[ = ₹ 5,964 \text{ (F)} \]
(ii) **Variable Overhead Variances**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>₹ 3.5 × 22,550 hrs.</td>
<td>20,500 hrs. × ₹ 3.45...</td>
<td>₹ 3.5 × 20,500 hrs.</td>
</tr>
<tr>
<td>₹ 78,925</td>
<td>₹ 70,870</td>
<td>₹ 71,750</td>
</tr>
</tbody>
</table>

*₹ 70,870/20,500 hrs.

**Note:**
- SR = Standard Rate per hour
- SH = Standard Hours = Expected Time for Actual Output
- AR = Actual Rate per hour
- AH = Actual Hours

**Variable Overhead Cost Variance**

\[
\text{Variable Overhead Cost Variance} = \text{Standard Variable Overheads for Production} - \text{Actual Variable Overheads} \\
= ₹ 78,925 - ₹ 70,870 \\
= ₹ 8,055 \text{ (F)}
\]

**Variable Overhead Expenditure Variance**

\[
\text{Variable Overhead Expenditure Variance} = \text{Budgeted Variable Overheads for Actual Hours} - \text{Actual Variable Overheads} \\
= ₹ 71,750 - ₹ 70,870 \\
= ₹ 880 \text{ (F)}
\]

**Variable Overhead Efficiency Variance**

\[
\text{Variable Overhead Efficiency Variance} = \text{Standard Variable Overheads for Production} - \text{Budgeted Variable Overheads for Actual hours} \\
= ₹ 78,925 - ₹ 71,750 \\
= ₹ 7,175 \text{ (F)}
\]

### Computation of Sales Variances

**Problem-7**

*Japan Products Ltd. had drawn up the following Sales budget for August, 2013:-*

- ‘B’ Product………………………………………5,000 units at ₹ 100 each
- ‘C’ Product………………………………………4,000 units at ₹ 200 each
- ‘S’ Product………………………………………6,000 units at ₹ 180 each
The actual sales for August, 2013 were:

‘B’ Product……………………………………. 5,750 units at ₹ 120 each
‘C’ Product……………………………………..4,850 units at ₹ 180 each
‘S’ Product……………………………………..5,000 units at ₹ 165 each

The costs per unit of B, C and S Product were ₹ 90, ₹ 170 and ₹ 130 respectively.

Required

Analyse the Sales Variances to show the effects on turnover & the effects on Profit.

Solution

**BASED ON SALES MARGIN**

**BASIC CALCULATIONS**

**Statement Showing “Budgeted Margin, Actual Margin and Standard Margin”**

<table>
<thead>
<tr>
<th>Product</th>
<th>Quantity (units)</th>
<th>Budgeted Margin per unit (₹)</th>
<th>Budgeted Margin (₹)</th>
<th>Actual Quantity (units)</th>
<th>Actual Margin per unit (₹)</th>
<th>Actual Margin (₹)</th>
<th>Std. Margin (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>5,000</td>
<td>10</td>
<td>50,000</td>
<td>5,750</td>
<td>30</td>
<td>1,72,500</td>
<td>57,500</td>
</tr>
<tr>
<td>C</td>
<td>4,000</td>
<td>30</td>
<td>1,20,000</td>
<td>4,850</td>
<td>10</td>
<td>48,500</td>
<td>1,45,500</td>
</tr>
<tr>
<td>S</td>
<td>6,000</td>
<td>50</td>
<td>3,00,000</td>
<td>5,000</td>
<td>35</td>
<td>1,75,000</td>
<td>2,50,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15,000</strong></td>
<td><strong>50</strong></td>
<td><strong>4,70,000</strong></td>
<td><strong>15,600</strong></td>
<td><strong>3,96,000</strong></td>
<td><strong>4,53,000</strong></td>
<td></td>
</tr>
</tbody>
</table>

**COMPUTATION OF VARIANCES**

Sales Margin Variance = Actual Margin – Budgeted Margin

For Product B

= ₹ 1,72,500 – ₹ 50,000

= ₹ 1,22,500 (F)

For Product C

= ₹ 48,500 – ₹ 1,20,000

= ₹ 71,500 (A)

For Product S

= ₹ 1,75,000 – ₹ 3,00,000

= ₹ 1,25,000 (A)
Total (B+ C+S) = ₹ 1,22,500 (F) + ₹ 71,500 (A) + ₹ 1,25,000 (A)
= ₹ 74,000 (A)

Sales Margin Price Variance = Actual Margin – Standard Margin
= AQ × AM – AQ × BM
  Or
  AQ × (AM – BM)
For Product B = ₹ 1,72,500 – ₹ 57,500
  = ₹ 1,15,000 (F)
For Product C = ₹ 48,500 – ₹ 1,45,500
  = ₹ 97,000 (A)
For Product S = ₹ 1,75,000 – ₹ 2,50,000
  = ₹ 75,000 (A)
Total (B + C + S) = ₹ 1,15,000 (F) + ₹ 97,000 (A) + ₹ 75,000 (A)
= ₹ 57,000 (A)

Sales Margin Volume Variance = Standard Margin – Budgeted Margin
= AQ× BM – BQ x BM
  Or
  BM × (AQ – BQ)
For Product B = ₹ 57,500 – ₹ 50,000
  = ₹ 7,500 (F)
For Product C = ₹ 1,45,500 – ₹ 1,20,000
  = ₹ 25,500 (F)
For Product S = ₹ 2,50,000 – ₹ 3,00,000
  = ₹ 50,000 (A)
Total (B + C+S) = ₹ 7,500 (F) + ₹ 25,500 (F) + ₹ 50,000 (A)
= ₹ 17,000 (A)

Sales Margin Mix Variance = Total Actual Quantity (units) × (Average Budgeted Margin per unit of Actual Mix – Average Budgeted Margin per unit of Budgeted Mix)
5.46 Advanced Management Accounting

= 15,600 units × \left( \frac{\text{₹} 4,53,000}{15,600 \text{ units}} - \frac{\text{₹} 4,70,000}{15,000 \text{ units}} \right)

= 35,800 (A)

Sales Margin Quantity = Average Budgeted Margin per unit of Budgeted Mix ×

Variance

\[ = \frac{\text{₹} 4,70,000}{15,000 \text{ units}} \times (15,600 \text{ Units} - 15,000 \text{ Units}) \]

= 18,800 (F)

BASED ON SALES VALUE

BASIC CALCULATIONS

Statement Showing “Budgeted Sales, Actual Sales Value and Standard Sales”

<table>
<thead>
<tr>
<th>Product Quantity</th>
<th>Budgeted (units)</th>
<th>Budgeted Price per unit (₹)</th>
<th>Budgeted Sales (₹)</th>
<th>Actual Quantity (units)</th>
<th>Actual Price per unit (₹)</th>
<th>Actual Sales (₹)</th>
<th>Std. Sales (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5,000</td>
<td>100</td>
<td>5,00,000</td>
<td>5,750</td>
<td>120</td>
<td>6,90,000</td>
<td>5,75,000</td>
</tr>
<tr>
<td>B</td>
<td>4,000</td>
<td>200</td>
<td>8,00,000</td>
<td>4,850</td>
<td>180</td>
<td>8,73,000</td>
<td>9,70,000</td>
</tr>
<tr>
<td>C</td>
<td>6,000</td>
<td>180</td>
<td>10,80,000</td>
<td>5,000</td>
<td>165</td>
<td>8,25,000</td>
<td>9,00,000</td>
</tr>
<tr>
<td>Total</td>
<td>15,000</td>
<td></td>
<td>23,80,000</td>
<td>15,600</td>
<td></td>
<td>24,45,000</td>
<td></td>
</tr>
</tbody>
</table>

COMPUTATION OF VARIANCES

Sales Value Variance = Actual Sales – Budgeted Sales

= AP × AQ – BP × BQ

For Product B = ₹ 6,90,000 – ₹ 5,00,000 = ₹ 1,90,000 (F)

For Product C = ₹ 8,73,000 – ₹ 8,00,000 = ₹ 73,000 (F)

For Product S = ₹ 8,25,000 – ₹ 10,80,000 = ₹ 2,55,000 (A)

Total = ₹ 1,90,000 (F) + ₹ 73,000 (F) + ₹ 2,55,000 (A)

= ₹ 8,000 (F)

Sales Price Variance = Actual Sales – Standard Sales

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\[ \text{Standard Costing} \] 5.47

\[ \text{For Product B} = 5,750 \text{ Units} \times (₹ 120.00 – ₹ 100.00) = ₹ 1,15,000 \text{ (F)} \]
\[ \text{For Product C} = 4,850 \text{ Units} \times (₹ 180.00 – ₹ 200.00) = ₹ 97,000 \text{ (A)} \]
\[ \text{For Product S} = 5,000 \text{ Units} \times (₹ 165.00 – ₹ 180.00) = ₹ 75,000 \text{ (A)} \]
\[ \text{Total} = ₹ 1,15,000 \text{ (F)} + ₹ 97,000 \text{ (A)} + ₹ 75,000 \text{ (A)} = ₹ 57,000 \text{ (A)} \]

\[ \text{Sales Volume Variance} = \text{Standard Sales} – \text{Budgeted Sales} \]
\[ \text{For Product B} = ₹ 100 \times (5,750 \text{ Units} – 5,000 \text{ Units}) = ₹ 75,000 \text{ (F)} \]
\[ \text{For Product C} = ₹ 200 \times (4,850 \text{ Units} – 4,000 \text{ Units}) = ₹ 1,70,000 \text{ (F)} \]
\[ \text{For Product S} = ₹ 180 \times (5,000 \text{ Units} – 6,000 \text{ Units}) = ₹ 1,80,000 \text{ (A)} \]
\[ \text{Total} = ₹ 75,000 \text{ (F)} + ₹ 1,70,000 \text{ (F)} + ₹ 1,80,000 \text{ (A)} = ₹ 65,000 \text{ (F)} \]

\[ \text{Sales Mix Variance} = \text{Total Actual Qty (units) × (Average Budgeted Price per unit of Actual Mix – Average Budgeted Price per unit of Budgeted Mix)} \]
\[ = 15,600 \text{ Units} \times \left( \frac{₹ 24,45,000}{15,600 \text{ Units}} - \frac{₹ 23,80,000}{15,000 \text{ Units}} \right) \]
\[ = 30,200 \text{ (A)} \]

\[ \text{Sales Quantity Variance} = \text{Average Budgeted Price per unit of Budgeted Mix × [Total Actual Qty (units) – Total Budgeted Qty (units)]} \]
\[ = \left( \frac{₹ 23,80,000}{15,000 \text{ Units}} \right) \times (15,600 \text{ Units} – 15,000 \text{ Units}) \]
\[ = ₹ 95,200 \text{ (F)} \]

**Problem-8**

*The Sales Manager of a company engaged in the manufacture and sale of three products K, L and M gives you the following information for the month of October 2013:* –
### Advanced Management Accounting

**Budgeted Sales:**

<table>
<thead>
<tr>
<th>Product</th>
<th>Units Sold</th>
<th>Selling Price per unit</th>
<th>Standard Contribution Margin per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>2,000</td>
<td>₹12</td>
<td>₹6</td>
</tr>
<tr>
<td>L</td>
<td>2,000</td>
<td>₹8</td>
<td>₹4</td>
</tr>
<tr>
<td>M</td>
<td>2,000</td>
<td>₹5</td>
<td>₹1</td>
</tr>
</tbody>
</table>

**Actual Sales:**

- **K:** 1,500 units for ₹15,000
- **L:** 2,500 units for ₹17,500
- **M:** 3,500 units for ₹21,000

**Required**

Calculate Sales Variances.

**Solution**

**BASED ON SALES MARGIN**

**BASIC CALCULATIONS**

Statement Showing “Budgeted Margin, Actual Margin and Standard Margin”

<table>
<thead>
<tr>
<th>Product</th>
<th>Quantity (units)</th>
<th>Budgeted Quantity (units)</th>
<th>Budgeted Margin per unit (₹)</th>
<th>Budgeted Margin (₹)</th>
<th>Actual Quantity (units)</th>
<th>Actual Margin per unit (₹)</th>
<th>Actual Margin (₹)</th>
<th>Std. Margin (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**COMPUTATION OF VARIANCES**

Sales Margin Variance = Actual Margin – Budgeted Margin

= AQ × AM – BQ × BM

For Product K = ₹ 6,000 – ₹ 12,000

= ₹ 6,000 (A)

For Product L = ₹ 7,500 – ₹8,000
Standard Costing

\[ \text{Sales Margin Price Variance} = \text{Actual Margin} - \text{Standard Margin} \]
\[ = AQ \times AM - AQ \times BM \]
\[ \text{Or} \]
\[ AQ \times (AM - BM) \]

For Product K:
\[ = ₹ 6,000 - ₹ 9,000 \]
\[ = ₹ 3,000 \text{ (A)} \]

For Product L:
\[ = ₹ 7,500 - ₹ 10,000 \]
\[ = ₹ 2,500 \text{ (A)} \]

For Product M:
\[ = ₹ 7,000 - ₹ 3,500 \]
\[ = ₹ 3,500 \text{ (F)} \]

Total (K + L + M):
\[ = ₹ 3,000 \text{ (A)} + ₹ 2,500 \text{ (A)} + ₹ 3,500 \text{ (F)} \]
\[ = ₹ 2,000 \text{ (A)} \]

\[ \text{Sales Margin Volume Variance} = \text{Standard Margin} - \text{Budgeted Margin} \]
\[ = AQ \times BM - BQ \times BM \]
\[ \text{Or} \]
\[ BM \times (AQ - BQ) \]

For Product K:
\[ = ₹ 9,000 - ₹ 12,000 \]
\[ = ₹ 3,000 \text{ (A)} \]

For Product L:
\[ = ₹ 10,000 - ₹ 8,000 \]
\[ = ₹ 2,000 \text{ (F)} \]

For Product M:
\[ = ₹ 3,500 - ₹ 2,000 \]
\[ = ₹ 1,500 \text{ (F)} \]

Total (K + L + M):
\[ = ₹ 3,000 \text{ (A)} + ₹ 2,000 \text{ (F)} + ₹ 1,500 \text{ (F)} \]
\[ = ₹ 500 \text{ (F)} \]
Sales Margin Mix Variance  
\[ \text{Sales Margin Mix Variance} = \text{Total Actual Quantity (units)} \times (\text{Average Budgeted Margin per unit of Actual Mix} - \text{Average Budgeted Margin per unit of Budgeted Mix}) \]
\[ = 7,500 \text{ Units} \times \left( \frac{\text{₹ 22,500}}{7,500 \text{ units}} - \frac{\text{₹ 22,000}}{6,000 \text{ units}} \right) \]
\[ = \text{5,000 (A)} \]

Sales Margin Quantity  
\[ \text{Sales Margin Quantity} = \text{Average Budgeted Margin per unit of Budgeted Mix} \times \left( \frac{\text{Total Actual Quantity (units)}}{\text{Total Budgeted Quantity (units)}} - 1 \right) \]
\[ = \left( \frac{\text{₹ 22,000}}{6,000 \text{ units}} \right) \times (7,500 \text{ Units} - 6,000 \text{ Units}) \]
\[ = \text{5,500 (F)} \]

**BASED ON SALES VALUE**

**BASIC CALCULATIONS**

Statement Showing “Budgeted Sales, Actual Sales Value and Standard Sales”

<table>
<thead>
<tr>
<th>Product Quantity (units)</th>
<th>Budgeted (units)</th>
<th>Budgeted Price per unit (₹)</th>
<th>Budgeted Sales (₹)</th>
<th>Actual Quantity (units)</th>
<th>Actual Price per unit (₹)</th>
<th>Actual Sales (₹)</th>
<th>Std. Sales (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>2,000</td>
<td>12</td>
<td>24,000</td>
<td>1,500</td>
<td>10</td>
<td>15,000</td>
<td>18,000</td>
</tr>
<tr>
<td>L</td>
<td>2,000</td>
<td>8</td>
<td>16,000</td>
<td>2,500</td>
<td>7</td>
<td>17,500</td>
<td>20,000</td>
</tr>
<tr>
<td>M</td>
<td>2,000</td>
<td>5</td>
<td>10,000</td>
<td>3,500</td>
<td>6</td>
<td>21,000</td>
<td>17,500</td>
</tr>
<tr>
<td>Total</td>
<td>6,000</td>
<td>50,000</td>
<td>7,500</td>
<td></td>
<td></td>
<td>53,500</td>
<td>55,500</td>
</tr>
</tbody>
</table>

**COMPUTATION OF VARIANCES**

Sales Value Variance  
\[ = \text{Actual Sales} - \text{Budgeted Sales} \]
\[ = \text{AP} \times \text{AQ} - \text{BP} \times \text{BQ} \]

For Product K  
\[ = \text{₹ 15,000} - \text{₹ 24,000} = \text{₹ 9,000 (A)} \]

For Product L  
\[ = \text{₹ 17,500} - \text{₹ 16,000} = \text{₹ 1,500 (F)} \]

For Product M  
\[ = \text{₹ 21,000} - \text{₹ 10,000} = \text{₹ 11,000 (F)} \]
Total

= ₹ 9,000 (A) + ₹ 1,500 (F) + ₹ 11,000 (F)

= ₹ 3,500 (F)

**Sales Price Variance**

= Actual Sales – Standard Sales

= AP × AQ – BP × AQ

Or

= AQ × (AP – BP)

For Product K

= 1,500 Units × (₹ 10.00 – ₹ 12.00) = ₹ 3,000 (A)

For Product L

= 2,500 Units × (₹ 7.00 – ₹ 8.00) = ₹ 2,500 (A)

For Product M

= 3,500 Units × (₹ 6.00 – ₹ 5.00) = ₹ 3,500 (F)

Total

= ₹ 3,000 (A) + ₹ 2,500 (A) + ₹ 3,500 (F)

= ₹ 2,000 (A)

**Sales Volume Variance**

= Standard Sales – Budgeted Sales

= BP × AQ – BP × BQ

Or

= BP × (AQ – BQ)

For Product A

= ₹ 12 × (1,500 Units – 2,000 Units) = ₹ 6,000 (A)

For Product B

= ₹ 8 × (2,500 Units – 2,000 Units) = ₹ 4,000 (F)

For Product C

= ₹ 5 × (3,500 Units – 2,000 Units) = ₹ 7,500 (F)

Total

= ₹ 6,000 (A) + ₹ 4,000 (F) + ₹ 7,500 (F)

= ₹ 1,500 (F)

**Sales Mix Variance**

= Total Actual Qty (units) × \(\left(\frac{\text{Average Budgeted Price per unit of Actual Mix}}{\text{Average Budgeted Price per unit of Budgeted Mix}}\right)\)

= 7,500 Units × \(\left[\frac{₹ 55,500}{7,500 \text{ Units}} - \frac{₹ 50,000}{6,000 \text{ Units}}\right]\)

= 7,000 (A)

**Sales Quantity Variance**

= Average Budgeted Price per unit of Budgeted Mix × [Total Actual Qty (units) – Total Budgeted Qty (units)]

= \(\left(\frac{₹ 50,000}{6,000 \text{ Units}}\right) \times (7,500 \text{ Units} – 6,000 \text{ Units})\)

= ₹ 12,500 (F)
Problem-9

Zed company manufactures two types of flooring rolls. Budgeted and actual data for 2015 are-

<table>
<thead>
<tr>
<th></th>
<th>Static Budget</th>
<th>Actual Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Industrial</td>
<td>Domestic</td>
</tr>
<tr>
<td>Unit Sales in Rolls ('000)</td>
<td>200</td>
<td>600</td>
</tr>
<tr>
<td>Contribution Margin (₹ in Lacs)</td>
<td>100.00</td>
<td>240.00</td>
</tr>
</tbody>
</table>

In late 2014, a marketing research estimated industrial volume for industrial and domestic flooring at 80 Lacs Rolls. Actual industry volume for 2015 was 70 Lacs Rolls.

Required

(i) Sales Mix Variance and Sales Quantity Variance by type of flooring rolls and in total.
(ii) Market Share Variance and Market Size Variance.

Solution

Workings

Statement Showing “Budgeted Vs Actual Figures”

<table>
<thead>
<tr>
<th>Product</th>
<th>Budgeted Qty. Rolls ('000) [BQ]</th>
<th>Budgeted Margin per Roll (₹) [BM]</th>
<th>Budgeted Margin (₹‘in lacs) [BM]</th>
<th>Actual Qty. Rolls ('000) [AQ]</th>
<th>Actual Margin per Roll (₹) [AM]</th>
<th>Actual Margin (₹‘in lacs) [AM]</th>
<th>Revised Actual Qty. ('000) [RAQ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>600</td>
<td>40</td>
<td>240.00</td>
<td>588</td>
<td>42</td>
<td>246.96</td>
<td>630 (840 &gt;75%)</td>
</tr>
<tr>
<td>Industrial</td>
<td>200</td>
<td>50</td>
<td>100.00</td>
<td>252</td>
<td>47.5</td>
<td>119.70</td>
<td>210 (840 &gt;25%)</td>
</tr>
<tr>
<td>Total</td>
<td>800</td>
<td>340.00</td>
<td>840</td>
<td>366.66</td>
<td></td>
<td></td>
<td>840</td>
</tr>
</tbody>
</table>

Budgeted Market Share (in %) = $\frac{8,00,000 \text{ Rolls}}{80,00,000 \text{ Rolls}}$
Actual Market Share (in %) = \( \frac{8,40,000 \text{ Rolls}}{70,00,000 \text{ Rolls}} \) = 12%

Average Budgeted Margin (per Roll) = \( \frac{\text{\text{₹} } 340 \text{ Lacs}}{8,00,000 \text{ Rolls}} \) = \text{\text{₹} } 42.50

Computation of Variances

Sales Mix Variance = Standard Margin Less Revised Standard Margin
Or
= (AQ × BM) – (RAQ × BM)
Or
= BM × (AQ – RAQ)
Domestic = \( ₹ 40 \times (5,88,000 – 6,30,000) \)
= \( ₹ 16,80,000 \) (A)
Industrial = \( ₹ 50 \times (2,52,000 – 2,10,000) \)
= \( ₹ 21,00,000 \) (F)
Total = \( ₹ 16,80,000 \) (A) + \( ₹ 21,00,000 \) (F)
= \( ₹ 4,20,000 \) (F)

Sales Quantity Variance = Revised Standard Margin Less Budgeted Margin
Or
= (RAQ × BM) – (BQ × BM)
Or
= BM × (RAQ – BQ)
Domestic = \( ₹ 40 \times (6,30,000 – 6,00,000) \)
= \( ₹ 12,00,000 \) (F)
Industrial = \( ₹ 50 \times (2,10,000 – 2,00,000) \)
= \( ₹ 5,00,000 \) (F)
Total = \( ₹ 1,200,000 \) (F) + \( ₹ 500,000 \) (F)
= \( ₹ 1,70,000 \) (F)
5.54 Advanced Management Accounting

**Market Size Variance**

\[
\text{Market Size Variance} = \text{Budgeted Market Share} \times (\text{Actual Industry Sales Quantity in units} - \text{Budgeted Industry Sales Quantity in units}) \times \text{Average Budgeted Margin per unit}
\]

\[
= 10\% \times (70,00,000 \text{ Rolls} - 80,00,000 \text{ Rolls}) \times \₹ 42.50
\]

\[
= 42,50,000 \text{ (A)}
\]

**Market Share Variance**

\[
\text{Market Share Variance} = (\text{Actual Market Share} - \text{Budgeted Market Share}) \times (\text{Actual Industry Sales Quantity in units}) \times \text{Average Budgeted Margin per unit}
\]

\[
= (12\% - 10\%) \times 70,00,000 \text{ Rolls} \times \₹ 42.50
\]

\[
= 59,50,000 \text{ (F)}
\]

**Computation of All Variances**

**Problem-10**

The Standard Cost Sheet per unit for the product produced by Style Manufacturers is worked out on this basis:

- **Direct Materials** 1.3 tons @ ₹ 4.00 per ton
- **Direct Labour** 2.9 hours @ ₹ 2.30 per hour
- **Factory Overhead** 2.9 hours @ ₹ 2.00 per hour

Normal Capacity is 2,00,000 direct labour hours per month.

The Factory Overhead rate is arrived at on the basis of a Fixed Overhead of ₹ 1,00,000 per month and a Variable Overhead of ₹ 1.50 per direct labour hour.

In the month of May, 50,000 units of the product was started and completed. An investigation of the raw material inventory account reveals that 78,000 tons of raw material were transferred into and used by the factory during May. These goods cost ₹ 4.20 per ton. 1,50,000 hours of Direct Labour were spent during May at a cost of ₹ 2.50 per hour. Factory Overhead for the month amounted to ₹ 3,40,000 out of which ₹ 1,02,000 was fixed.

**Required**

(a) Compute and identify all variances under Material, Labour and overhead as favourable or adverse.

(b) Identify one or more departments in the company who might be held responsible for each variance.
Solution

COMPUTATION OF VARIANCES

(i) Material Price Variance

\[ \text{Material Price Variance} = \text{Standard Cost of Actual Quantity} - \text{Actual Cost} \]

\[ = (SP \times AQ) - (AP \times AQ) \]

\[ = (SP - AP) \times AQ \]

\[ = 78,000 \text{ tons} \times (\text{₹} 4.00 - \text{₹} 4.20) \]

\[ = \text{₹} 15,600 \text{ (A)} \]

(ii) Material Usage Variance

\[ \text{Material Usage Variance} = \text{Standard Cost of Standard Quantity for Actual Production} - \text{Standard Cost of Actual Quantity} \]

\[ = (SQ \times SP) - (AQ \times SP) \]

\[ = (SQ - AQ) \times SP \]

\[ = \text{₹} 4.00 \times [(50,000 \text{ units} \times 1.3 \text{ tons}) - 78,000 \text{ tons}] \]

\[ = \text{₹} 52,000 \text{ (A)} \]

(iii) Total Material Cost Variance

\[ \text{Total Material Cost Variance} = \text{Standard Cost} - \text{Actual Cost} \]

\[ = (SQ \times SP) - (AQ \times AP) \]

\[ = 65,000 \text{ tons} \times \text{₹} 4 - 78,000 \text{ tons} \times \text{₹} 4.2 \]

\[ = \text{₹} 67,600 \text{ (A)} \]

(iv) Labour Rate Variance

\[ \text{Labour Rate Variance} = \text{Standard Cost of Actual Time} - \text{Actual Cost} \]

\[ = (SR \times AH) - (AR \times AH) \]

\[ = (SR - AR) \times AH \]

\[ = 1,50,000 \text{ hrs.} \times (\text{₹} 2.30 - \text{₹} 2.50) \]

\[ = \text{₹} 30,000 \text{ (A)} \]

(v) Labour Efficiency Variance

\[ \text{Labour Efficiency Variance} = \text{Standard Cost of Standard Time for Actual Production} - \text{Standard Cost of Actual Time} \]

\[ = (SH \times SR) - (AH \times SR) \]

\[ = (SH - AH) \times SR \]
\[ \text{Total Labour Cost Variance} = \text{Standard Cost} - \text{Actual Cost} \\
= (SH \times SR) - (AH \times AR) \\
= (1,45,000 \text{ hrs.} \times \text{₹}2.30) - (1,50,000 \text{ hrs.} \times \text{₹}2.50) \\
= \text{₹}41,500 \text{ (A)} \]

\[ \text{Variable Overhead Cost Variance} = \text{Standard Variable Overheads for Production} - \text{Actual Variable Overheads} \\
= (50,000 \text{ units} \times 2.9 \text{ hrs.} \times \text{₹}1.50) - \text{₹}2,38,000 \\
= \text{₹}20,500 \text{ (A)} \]

\[ \text{Fixed Overhead Expenditure} = \text{Budgeted Fixed Overheads} - \text{Actual Fixed Overheads} \\
= \text{₹}1,00,000 - \text{₹}1,02,000 \\
= \text{₹}2,000 \text{ (A)} \]

\[ \text{Fixed Overhead Volume Variance} = \text{Absorbed Fixed Overheads} - \text{Budgeted Fixed Overheads} \\
= 2.9 \text{ hrs.} \times \text{₹}0.50 \times 50,000 \text{ units} - \text{₹}1,00,000 \\
= \text{₹}27,500 \text{ (A)} \]

\[ \text{Fixed Overhead Capacity Variance} = \text{Budgeted Fixed Overheads for Actual Hours} - \text{Budgeted Fixed Overheads} \\
= (1,50,000 \text{ hrs.} \times \text{₹}0.50) - \text{₹}1,00,000 \\
= \text{₹}25,000 \text{ (A)} \]

\[ \text{Fixed Efficiency Variance} = \text{Absorbed Fixed Overheads} - \text{Budgeted Fixed Overheads for Actual Hours} \\
= (2.9 \text{ hrs.} \times \text{₹}0.50 \times 50,000 \text{ units}) - (1,50,000 \text{ hrs.} \times \text{₹}0.50) \\
= \text{₹}2,500 \text{ (A)} \]

\[ \text{Total Fixed Overhead Variance} = \text{Absorbed Fixed Overheads} - \text{Actual Fixed Overheads} \\
= (2.9 \text{ hrs.} \times \text{₹}0.50 \times 50,000 \text{ units}) - \text{₹}1,02,000 \\
= \text{₹}29,500 \text{ (A)} \]
IDENFICATION OF DEPARTMENT(S) WHO MIGHT BE HELD RESPONSIBLE FOR EACH VARIANCE

<table>
<thead>
<tr>
<th>Name of Variance</th>
<th>Name of the Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Price Variance</td>
<td>Purchase Department</td>
</tr>
<tr>
<td>Material Usage Variance</td>
<td>Production Department / Factory Foreman</td>
</tr>
<tr>
<td>Labour Rate Variance</td>
<td>Personnel Department / Manager Policy</td>
</tr>
<tr>
<td>Labour Efficiency Variance</td>
<td>Production Department / Factory Foreman</td>
</tr>
<tr>
<td>Overhead Variances</td>
<td>Production Department / Factory Foreman</td>
</tr>
</tbody>
</table>

**Problem-11**

Thomson Exports Ltd. manufactures readymade shirts of a specific quantity in lots to each special order from its overseas customers.

The Standard Costs for one dozen of shirts are:

- **Direct Material (24 metres @ ₹ 22)**: ₹528
- **Direct Labour (3 hours @ ₹ 98)**: ₹294
- **Overheads (3 hours @ ₹ 80)**: ₹240

During July, 2013 it worked on three orders, for which the month’s job cost records show the following:

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Units</th>
<th>Materials used</th>
<th>Hours worked</th>
</tr>
</thead>
<tbody>
<tr>
<td>245 (UK)</td>
<td>1,700 Doz.</td>
<td>40,440 Metres</td>
<td>5,130</td>
</tr>
<tr>
<td>246 (US)</td>
<td>1,200 Doz.</td>
<td>28,825 Metres</td>
<td>2,890</td>
</tr>
<tr>
<td>247 (HK)</td>
<td>1,000 Doz.</td>
<td>24,100 Metres</td>
<td>2,980</td>
</tr>
</tbody>
</table>

Additional information:

(a) The company bought 95,000 metres of materials during July at a cost of ₹21,28,000. The material price variance is recorded when materials are purchased. All inventories are carried at cost.

(b) Direct labour during July, 2013 amounted to ₹11,00,000, labour were paid at ₹100 per hour.

(c) Overheads during the month amounted to ₹9,12,000.

(d) A total of ₹1,15,20,000 was budgeted for overheads for the year 2013-14, based on estimated production of the plant’s normal capacity of 48,000 dozen shirts annually. Overheads at the level of production is 40% fixed and 60% variable. Overheads is applied on the basis of direct labour hours.
There was no work in progress at the beginning of July. During July, lot nos. 245 and 247 were completed. All materials were issued for lot no. 246 which was 80% complete as regards conversion.

**Required**

(i) Computation of standard cost of production of the shirts per dozen as well as in total for lot Nos. 245, 246 and 247.

(ii) Find out the variation in quantity of material used and labour hours worked for each lot as well as in total.

(iii) Calculate the material price variance; labour rate variance; variable overheads efficiency variance and fixed overheads volume variance.

**Solution**

(i) **COMPUTATION OF STANDARD COST OF PRODUCTION** of the shirts per dozen as well as in total for Lot Nos. 245, 246, 247

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Cost per dozen (₹)</th>
<th>Dozens</th>
<th>Total Standard Cost (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>245 (UK)</td>
<td>1,062*</td>
<td>1,700</td>
<td>18,05,400</td>
</tr>
<tr>
<td>246 (US)</td>
<td>955.20*</td>
<td>1,200</td>
<td>11,46,240</td>
</tr>
<tr>
<td>247 (HK)</td>
<td>1,062*</td>
<td>1,000</td>
<td>10,62,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>40,13,640</td>
</tr>
</tbody>
</table>

* Lot No. 245/247

100% as regards to material cost  ₹ 528.00
100% as regards to conversion cost  ₹ 534.00

 Cornwall **Solution**

(ii) **STATEMENT OF VARIATION** between standard quantity of material and actual quantity of material used for each lot as well as in total

<table>
<thead>
<tr>
<th>Lot Nos.</th>
<th>Output (In Dozens)</th>
<th>Std. Qty. Per Dozen (In Metre)</th>
<th>Total Std. Quantity (In Metres)</th>
<th>Total Actual Quantity (In Metres)</th>
<th>Variation (In Metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>245 (UK)</td>
<td>1,700</td>
<td>24</td>
<td>40,800</td>
<td>40,440</td>
<td>360 (F)</td>
</tr>
</tbody>
</table>
### STATEMENT OF VARIATION between standard labour hours and actual labour hours worked for each lot as well as in total

<table>
<thead>
<tr>
<th>Lot Nos.</th>
<th>Output (In Dozens)</th>
<th>Std. Labour Hours Per Dozen</th>
<th>Total Std. Labour Hours</th>
<th>Total Actual Labour Hours</th>
<th>Variation (In Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>245 (UK)</td>
<td>1,700</td>
<td>3</td>
<td>5,100</td>
<td>5,130</td>
<td>30 (A)</td>
</tr>
<tr>
<td>246 (US)</td>
<td>1,200</td>
<td>3</td>
<td>2,880</td>
<td>2,890</td>
<td>10 (A)</td>
</tr>
<tr>
<td>247 (HK)</td>
<td>1,000</td>
<td>3</td>
<td>3,000</td>
<td>2,980</td>
<td>20 (F)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10,980</strong></td>
<td></td>
<td><strong>11,000</strong></td>
<td></td>
<td><strong>20 (F)</strong></td>
</tr>
</tbody>
</table>

(iii) **CALCULATION OF VARIANCES**

**Material Price Variance**

\[
\text{Material Price Variance} = \text{Purchase Quantity} \times (\text{Standard Price} - \text{Actual Price})
\]

\[
= 95,000 \text{ Metres} \times \left( \frac{\text{₹} 22 - \text{₹} 21.28,000}{95,000 \text{ Metres}} \right)
\]

\[= \text{₹} 20,90,000 - \text{₹} 21,28,000\]

\[= \text{₹} 38,000 (A)\]

**Labour Rate Variance**

\[
\text{Labour Rate Variance} = \text{Actual Hrs.} \times (\text{Std. Rate per hour} - \text{Actual Rate per hour})
\]

\[
= 11,000 \text{ Hrs.} \times (\text{₹} 98 - \text{₹} 100)
\]

\[= \text{₹} 22,000 (A)\]

**Variable Overhead Efficiency Variance**

\[
\text{Variable Overhead Efficiency Variance} = \text{Std. Variable Overhead Rate per hour}^* \times (\text{Std. Hours for Actual Output} - \text{Actual Hours})
\]

\[
= \text{₹} 48 \times (10,980 \text{ Hrs.} - 11,000 \text{ Hrs.})
\]

\[= \text{₹} 960 (A)\]

\(^*\text{Standard Variable Overhead Rate per hour} = 60\% \text{ of ₹} 80 = \text{₹} 48\)

**Fixed Overhead**

\[
\text{Fixed Overhead} = \text{Std. Fixed Overhead Rate per hour}^{**} \times (\text{Std. Hrs. for Actual Output} - \text{Budgeted Hours})
\]
### Problem-12

The following information relates to a manufacturing concern:

<table>
<thead>
<tr>
<th>Standard</th>
<th>( ₹ )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material A 24,000 kgs @ ( ₹ 3 ) per kg.</td>
<td>72,000</td>
</tr>
<tr>
<td>Material B 12,000 kgs @ ( ₹ 4 ) per kg</td>
<td>48,000</td>
</tr>
<tr>
<td>Wages 60,000 hours @ ( ₹ 4 ) per hour</td>
<td>2,40,000</td>
</tr>
<tr>
<td>Variable Overheads 60,000 hours @ ( ₹ ) per hour</td>
<td>60,000</td>
</tr>
<tr>
<td>Fixed Overheads 60,000 hours @ ( ₹ 2 ) per hour</td>
<td>1,20,000</td>
</tr>
<tr>
<td>Total Cost</td>
<td>5,40,000</td>
</tr>
<tr>
<td>Budgeted Profit</td>
<td>60,000</td>
</tr>
<tr>
<td>Budgeted Sales</td>
<td>6,00,000</td>
</tr>
<tr>
<td>Budgeted Production (units)</td>
<td>12,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Actual</th>
<th>( ₹ )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (9,000 units)</td>
<td>4,57,500</td>
</tr>
<tr>
<td>Material A Consumed 22,275 kgs.</td>
<td>62,370</td>
</tr>
<tr>
<td>Material B Consumed 10,890 kgs.</td>
<td>44,649</td>
</tr>
<tr>
<td>Wages Paid (48,000 hours)</td>
<td>1,91,250</td>
</tr>
<tr>
<td>Fixed Overhead</td>
<td>1,20,900</td>
</tr>
<tr>
<td>Variable Overhead</td>
<td>45,000</td>
</tr>
<tr>
<td>Labour Hours Worked</td>
<td>47,700</td>
</tr>
<tr>
<td>Closing (Work in Progress)</td>
<td>900 units</td>
</tr>
</tbody>
</table>

**Degree of Completion**

- Material A and B: 100%
- Wage and Overheads: 50%

**Required**

Calculate all variances.
Solution

BASIC CALCULATIONS

Equivalent Production in Units

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Direct Materials</th>
<th>Labour &amp; Overhead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units Completed</td>
<td>100% 9,000</td>
<td>100% 9,000</td>
</tr>
<tr>
<td>Work-in-Progress</td>
<td>100% 900</td>
<td>50% 450</td>
</tr>
<tr>
<td>Total Equivalent Units</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Standard and Actual Cost of Material

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard Cost of 9,900 units</th>
<th>Actual Cost of 9,900 units</th>
<th>Amt (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Qty. (Kg.) [SQ] Rate (₹) [SP] Amt (₹) [SQ × SP]</td>
<td>Qty. (Kg.) [AQ] Rate (₹) [AP] Amt (₹) [AQ × AP]</td>
<td>[AQ × SP]</td>
</tr>
<tr>
<td>A</td>
<td>19,800 3 59,400 22,275 2.80* 62,370</td>
<td>66,825</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>9,900 4 39,600 10,890 4.10* 44,649</td>
<td>43,560</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>29,700</td>
<td>99,000 33,165</td>
<td>1,07,019</td>
</tr>
</tbody>
</table>

*Actual Cost/Actual Quantity

COMPUTATION OF VARIANCES

Direct Material Variances

Material Cost Variance = Standard Cost – Actual Cost
                        = SQ × SP – AQ × AP

(A) = ₹ 59,400 – ₹ 62,370
     = ₹ 2,970 (A)

(B) = ₹ 39,600 – ₹ 44,649
     = ₹ 5,049 (A)

Total = ₹ 2,970 (A) + ₹ 5,049 (A)
       = ₹ 8,019 (A)

Material Price Variance = Standard Cost of Actual Quantity – Actual Cost
                         = AQ × SP – AQ × AP

Or
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\[ \text{Material Usage Variance} = \text{Standard Cost of Standard Quantity for Actual Output} - \text{Standard Cost of Actual Quantity} \]
\[ = SQ \times SP - AQ \times SP \]
\[ \text{Or} \]
\[ = SP \times (SQ - AQ) \]

(A) = 3 × (19,800 Kg. − 22,275 Kg.)
= ₹ 7,425 (A)

(B) = 4 × (9,900 Kg. − 10,890 Kg.)
= ₹ 3,960 (A)

Total = ₹ 7,425 (A) + ₹ 3,960 (A)
= ₹ 11,385 (A)

Material Mix Variance = Total Actual Quantity (units) × (Average Standard Price per unit of Standard Mix − Average Standard Price per unit of Actual Mix)

\[ = 33,165 \times \left( \frac{₹ 99,000}{29,700 \text{ Kg.}} - \frac{₹ 1,10,385}{33,165 \text{ Kg.}} \right) \]
\[ = ₹ 165 (F) \]

Material Yield Variance = Average Standard Price per unit of Standard Mix × [Total Standard Quantity (units) − Total Actual Quantity (units)]

\[ = \left( \frac{₹ 99,000}{29,700 \text{ Kg.}} \right) \times (29,700 \text{ Kg.} - 33,165 \text{ Kg.}) \]
\[ = ₹ 11,550 (A) \]

Direct Labour Variances

Labour Cost Variance = Standard Cost – Actual Cost
\[ = SH \times SR - AH^* \times AR \]
Standard Costing

= \((9,450 \text{ units} \times 5 \text{ hours}) \times ₹4 – ₹1,91,250\)
= ₹2,250 (A)

**Labour Rate Variance**

= Standard Cost of Actual Time – Actual Cost
= \(SR \times AH^* – AR \times AH^*\)

Or
= \((SR – AR) \times AH^*\)
= \(\left(₹4 – \frac{₹1,91,250}{48,000 \text{hours}}\right) \times 48,000 \text{ hours}\)

= ₹750 (F)

\(AH^*\) refers to Actual Hours Paid

**Labour Efficiency Variance**

= Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time
= \((SH \times SR) – (AH^# \times SR)\)

Or
= \((SH – AH^#) \times SR\)
= ₹4.00 \times (9,450 \text{ units} \times 5 \text{ hours} – 47,700 \text{ hours})
= ₹1,800 (A)

**Idle Time Variance**

= Standard Rate per Hour \times Actual Idle Hours
= \((AH^’ \times SR) – (AH^# \times SR)\)

Or
= \((AH^’ – AH^#) \times SR\)
= ₹4.00 \times (48,000 \text{ hours} – 47,700 \text{ hours})
= ₹1,200 (A)

\(AH^#\) refers to Actual Hours Worked

**Variable Overhead Variances**

**Cost Variance**

= Standard Variable Overheads for Production – Actual Variable Overheads
= \(9,450 \text{ units} \times \left(\frac{₹60,000}{12,000 \text{ units}}\right) – ₹45,000\)
= ₹2,250 (F)
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**Expenditure Variance**
\[ \text{Expenditure Variance} = \text{Budgeted Variable Overheads for Actual Hours} - \text{Actual Variable Overheads} \]
\[ = 47,700 \times (\text{\textcurrency{} 1} - \text{\textcurrency{} 45,000}) \]
\[ = \text{\textcurrency{} 2,700 (F)} \]

**Efficiency Variances**
\[ \text{Efficiency Variances} = \text{Standard Variable Overheads for Production} - \text{Budgeted Variable Overheads for Actual Hours} \]
\[ = 9,450 \times \left( \frac{\text{\textcurrency{} 60,000}}{\text{12,000 units}} \right) - 47,700 \times \text{\textcurrency{} 1} \]
\[ = \text{\textcurrency{} 450 (A)} \]

**Fixed Overhead Variances**

**Cost Variance**
\[ \text{Cost Variance} = \text{Absorbed Fixed Overheads} - \text{Actual Fixed Overheads} \]
\[ = 9,450 \times \left( \frac{\text{\textcurrency{} 1,20,000}}{\text{12,000 units}} \right) - \text{\textcurrency{} 1,20,900} \]
\[ = \text{\textcurrency{} 94,500} - \text{\textcurrency{} 1,20,900} \]
\[ = \text{\textcurrency{} 26,400 (A)} \]

**Expenditure Variance**
\[ \text{Expenditure Variance} = \text{Budgeted Fixed Overheads} - \text{Actual Fixed Overheads} \]
\[ = \text{\textcurrency{} 1,20,000} - \text{\textcurrency{} 1,20,900} \]
\[ = \text{\textcurrency{} 900 (A)} \]

**Volume Variance**
\[ \text{Volume Variance} = \text{Absorbed Fixed Overheads} - \text{Budgeted Fixed Overheads} \]
\[ = \text{\textcurrency{} 94,500} - \text{\textcurrency{} 1,20,000} \]
\[ = \text{\textcurrency{} 25,500 (A)} \]

**Efficiency Variance**
\[ \text{Efficiency Variance} = \text{Absorbed Fixed Overheads} - \text{Budgeted Fixed Overheads for Actual Hours} \]
\[ = \text{\textcurrency{} 94,500} - 2.00 \times 47,700 \]
\[ = \text{\textcurrency{} 900 (A)} \]

**Capacity Variance**
\[ \text{Capacity Variance} = \text{Budgeted Fixed Overheads for Actual Hours} - \text{Budgeted Fixed Overheads} \]
\[ = 2.00 \times 47,700 \text{ hours} - \text{\textcurrency{} 1,20,000} \]
\[ = \text{\textcurrency{} 24,600 (A)} \]

**Sales Variances**

**Value Variance**
\[ \text{Value Variance} = \text{Actual Sales} - \text{Budgeted Sales} \]
\[ = \text{AP} \times \text{AQ} - \text{BP} \times \text{BQ} \]
\[ \text{Price Variance} = \text{Actual Sales} - \text{Standard Sales} \\
= \text{AP} \times \text{AQ} - \text{BP} \times \text{AQ} \\
\text{Or} \\
= \text{AQ} \times (\text{AP} - \text{BP}) \\
= 9,000 \times \left[ \frac{\text{₹4,57,500}}{9,000 \text{units}} - \frac{\text{₹6,00,000}}{12,000 \text{units}} \right] \\
= 7,500 \text{ (F)} \\
\]

\[ \text{Volume Variance} = \text{Standard Sales} - \text{Budgeted Sales} \\
= \text{BP} \times \text{AQ} - \text{BP} \times \text{BQ} \\
\text{Or} \\
= \text{BP} \times (\text{AQ} - \text{BQ}) \\
= \text{₹50} \times (9,000 \text{ units} - 12,000 \text{ units}) \\
= \text{₹1,50,000} \text{ (A)} \\
\]

\[ \text{Sales Margin Variances} \\
\text{Sales Margin Price Variance} = \text{Sales Price Variance} \\
= 7,500 \text{ (F)} \\
\]

\[ \text{Sales Volume Variance} = \text{Sales Volume Variance} \times \text{Budgeted Net Profit Ratio} \\
= 1,50,000 \text{ (A)} \times \left( \frac{\text{₹60,000}}{\text{₹6,00,000}} \times 100 \right) \\
= 15,000 \text{ (A)} \\
\]

\[ \text{Margin Variance} = \text{Sales Margin Price Variance} + \text{Sales Margin Volume Variance} \\
= 7,500 \text{ (F)} + 15,000 \text{ (A)} \\
= 7,500 \text{ (A)} \\
\]
Sales Price Variance is equal to Sales Margin Price Variance. This is because, for the actual quantity sold, standard cost remaining constant, change in selling price will have equal impact or turnover and profit.

Sales Margin Volume Variance is equal to Sales Volume Variance × Budgeted Net Profit Ratio

Overhead Variances can also be affected by idle time. It is usually assumed that Overheads are incurred when labour is working, not when it is idle. Accordingly, hours worked has been considered for the calculation of Variable and Fixed Overheads Variances.

Problem-13

An engineering company manufactures a single product whose standard cost structure is as follows:

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material</td>
<td>(2.4 kg. at ₹ 30 per kg.)</td>
<td>72.00</td>
<td></td>
</tr>
<tr>
<td>Direct Labour</td>
<td>(6 hours at ₹ 4 per hour)</td>
<td>24.00</td>
<td></td>
</tr>
<tr>
<td>Factory Overheads</td>
<td>(6 hours at ₹ 75 per hour)</td>
<td>4.50</td>
<td></td>
</tr>
</tbody>
</table>

The factory overhead is based on the following Flexible Budget:

<table>
<thead>
<tr>
<th></th>
<th>80%</th>
<th>90%</th>
<th>100%</th>
<th>110%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production (Units)</td>
<td>6,000</td>
<td>6,750</td>
<td>7,500</td>
<td>8,250</td>
</tr>
<tr>
<td>Variable Overheads</td>
<td>18,000</td>
<td>20,250</td>
<td>22,500</td>
<td>24,750</td>
</tr>
<tr>
<td>Fixed Overheads</td>
<td>11,250</td>
<td>11,250</td>
<td>11,250</td>
<td>11,250</td>
</tr>
</tbody>
</table>

Actual data for the month of December, 2013

Budgeted Production……………………………………….75,000 units
Material used………………………………………………19,240 kg. at ₹ 31 per kg.
Direct Labour……………………………………………46,830 hours at ₹ 4.20 per hour
Actual Factory Overhead…………………………………₹ 36,340
Production completed……………………………………..7,620 units

Details of Work-in-progress: Opening 120 units materials fully supplied, .50% converted
Closing 100 units, materials fully supplied, 50% converted
Required

Solution

COMPUTATION OF VARIANCES

Direct Material Cost Variance
= Standard Cost – Actual Cost
= Std. Qty. × Std. Price – Actual Qty. × Actual Price
= (7,600 units × 2.4 kg) × ₹ 30 – 19,240 kg × ₹ 31
= ₹ 5,47,200 – ₹ 5,96,440
= ₹ 49,240 (A)

Direct Material Price Variance
= Standard Cost of Actual Quantity – Actual Cost
Or
= Actual Qty. × (Std. Price – Actual Price)
= 19,240 kg × (₹ 30 – ₹ 31)
= 19,240 (A)

Direct Material Usage Variance
= Standard Cost of Standard Quantity for Actual Production – Standard Cost of Actual Quantity
Or
= Std. Price × (Std. Qty. – Actual Qty.)
= ₹ 30 × (7,600 units x 2.4 kg – 19,240 kg)
= ₹ 30 × (18,240 – 19,240)
= ₹ 30,000 (A)

Direct Labour Cost Variance
= Standard Cost – Actual Cost
= Std. Hours × Std. Rate – Actual Hours × Actual Rate
= (7,610 units x 6 hours) × ₹ 4 – 46,830 hours × ₹ 4.2
= ₹ 1,82,640 – ₹ 1,96,686
= ₹ 14,046 (A)

Direct Labour Rate Variance
= Standard Cost of Actual Time – Actual Cost
5.68 Advanced Management Accounting

\[ \text{Direct Labour Efficiency Variance} = \text{Standard Cost of Standard Time for Actual Production} - \text{Standard Cost of Actual Time} \]

\[ \begin{align*}
&= \text{Std. Rate} \times (\text{Std. Hours} - \text{Actual Hours}) \\
&= \text{₹} \times (7,610 \text{ units} \times 6 \text{ hours} - 46,830 \text{ hours}) \\
&= \text{₹} 4,680 \text{ (A)}
\end{align*} \]

\[ \text{Factory Overhead Cost Variance} = \text{Absorbed Overheads} - \text{Actual Overheads} \]

\[ \begin{align*}
&= \text{₹} 4.5 \times 7,610 \text{ units} - \text{₹} 36,340 \\
&= \text{₹} 2,095 \text{ (A)}
\end{align*} \]

\[ \text{Fixed Factory Overhead Volume Variance} = \text{Absorbed Fixed Overheads} - \text{Budgeted Fixed Overheads} \]

\[ \begin{align*}
&= \text{₹} 1.5 \times 7,610 \text{ units} - \text{₹} 11,250 \\
&= \text{₹} 11,415 - \text{₹} 11,250 \\
&= \text{₹} 165 \text{ (F)}
\end{align*} \]

\[ \text{Fixed Factory Overhead Capacity Variance} = \text{Budgeted Fixed Overheads for Actual Hours} - \text{Budgeted Fixed Overheads} \]

\[ \begin{align*}
&= \text{Std. Rate per hour} \times (\text{Actual Hours} - \text{Budgeted Hours}) \\
&= \text{₹} 0.25 \times (46,830 \text{ hours} - 7,500 \text{ units} \times 6 \text{ hours}) \\
&= \text{₹} 457.50 \text{ (F)}
\end{align*} \]

\[ \text{Fixed Factory Overhead Efficiency Variance} = \text{Absorbed Fixed Overheads} - \text{Budgeted Fixed Overheads for Actual Hours} \]

\[ \begin{align*}
&= \text{Std. Rate per hour} \times (\text{Std. Hours for Actual Output} - \text{Actual Hours})
\end{align*} \]
Variable Factory Overhead Efficiency Variance

\[ \text{Variable Factory Overhead Efficiency Variance} = \text{Std. Variable Overheads for Production} - \text{Budgeted Variable Overheads for Actual Hours} \]

Or

\[ = \text{Std. Rate per hour} \times (\text{Std. Hours for Actual Output} - \text{Actual Hours}) \]

\[ = \left( \frac{\text{₹}\,1.5}{6\text{hrs.}} \right) \times (7,610 \text{ units} \times 6 \text{ hours} - 46,830 \text{ hours}) \]

\[ = \text{₹}\,292.50 \text{ (A)} \]

\[ \text{Variable Overheads for Actual Hours} \]

\[ = \left( \frac{\text{₹}\,3.0}{6\text{hrs.}} \right) \times (7,610 \text{ units} \times 6 \text{ hours} - 46,830 \text{ hours}) \]

\[ = \text{₹}\,585 \text{ (A)} \]

WORKING NOTES

<table>
<thead>
<tr>
<th></th>
<th>Equivalent units regarding Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Units</td>
</tr>
<tr>
<td></td>
<td>Production Completed</td>
</tr>
<tr>
<td>Add: Closing Stock equivalent units</td>
<td>100</td>
</tr>
<tr>
<td>Less: Opening Stock equivalent units</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Equivalent units regarding Labour and Overheads</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Units</td>
</tr>
<tr>
<td></td>
<td>Production Completed</td>
</tr>
<tr>
<td>Add: Closing Stock equivalent units</td>
<td>50</td>
</tr>
<tr>
<td>Less: Opening Stock equivalent units</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Problem-14

Alpha Ltd. uses standard costing system for manufacturing its single product ‘APS’. Standard cost card per unit is as follows:

\[
\begin{align*}
\text{Selling Price} & \quad \text{..........................................................} \quad 120 \\
\text{Direct Material (1 kg per unit)} & \quad \text{..........................................................} \quad 20
\end{align*}
\]
5.70 Advanced Management Accounting

Direct Labour (6 hrs @ ₹ 8 per hour) ............................... 48
Variable Overheads ......................................................... 24
Contribution ................................................................. 28

Actual and budgeted activity levels in units for the month of September are:

<table>
<thead>
<tr>
<th></th>
<th>Budget</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>50,000</td>
<td>51,200</td>
</tr>
<tr>
<td>Production</td>
<td>50,000</td>
<td>52,000</td>
</tr>
</tbody>
</table>

Actual sales revenue and variable costs for the month of September are given as under:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>61,33,760</td>
<td></td>
</tr>
<tr>
<td>Direct Material</td>
<td>10,65,600</td>
<td></td>
</tr>
<tr>
<td>Direct Labour (3,00,000 hrs)</td>
<td>24,42,000</td>
<td></td>
</tr>
<tr>
<td>Variable Overheads</td>
<td>12,28,000</td>
<td></td>
</tr>
</tbody>
</table>

**Required**

(i) Calculate Direct Labour Rate Variance
(ii) Calculate Direct Labour Efficiency Variance
(iii) Calculate Sales Volume Variance
(iv) Calculate Sales Price Variance
(v) Comment on your findings in (i) and (ii) above.

**Solution**

(i) **Labour Rate Variance**

\[ \text{Labour Rate Variance} = \text{Standard Cost of Actual Time} - \text{Actual Cost} \]

\[ = (SR \times AH) - (AR \times AH) \]

Or

\[ = (SR - AR) \times AH \]

\[ = (¥8.00 - ¥8.14) \times 3,00,000 \text{ hrs.} \]

\[ = ₹42,000 \text{ (A)} \]

Working

Actual Labour Rate per hour

\[ = \frac{\text{ActualPaid}}{\text{ActualHours}} \]

\[ = \frac{₹ 24,42,000}{3,00,000 \text{ hrs.}} \]
(ii) **Labour Efficiency Variance**

\[
\text{Labour Efficiency Variance} = \text{Standard Cost of Standard Time for Actual Production} - \text{Standard Cost of Actual Time} = (SH \times SR) - (AH \times SR)
\]

Or

\[
= (SH - AH) \times SR
\]

\[
= (3,12,000 \text{ hrs.} - 3,00,000 \text{ hrs.}) \times 8.00
\]

\[
= \₹96,000 \text{ (F)}
\]

**Working**

- **Standard Hours**
  - \(\text{Actual Production} \times \text{Std. hrs. per unit}\)
  - \(52,000 \text{ units} \times 6 \text{ hrs.}\)
  - \(3,12,000 \text{ hrs.}\)

(iii) **Sales Volume Variance**

\[
\text{Sales Volume Variance} = \text{Standard Sales} - \text{Budgeted Sales}
\]

Or

\[
= \text{Budgeted Price} \times (\text{Actual Quantity} - \text{Budgeted Quantity})
\]

\[
= \₹120 \times (51,200 \text{ units} - 50,000 \text{ units})
\]

\[
= \₹1,44,000 \text{ (F)}
\]

(iv) **Sales Price Variance**

\[
\text{Sales Price Variance} = \text{Actual Sales} - \text{Standard Sales}
\]

Or

\[
= \text{Actual Quantity} \times (\text{Actual Price} - \text{Budgeted Price})
\]

\[
= 51,200 \text{ units} \times (\₹119.80 - \₹120)
\]

\[
= \₹10,240 \text{ (A)}
\]

**Working**

- **Actual Sales Price**
  - \(\frac{\text{ActualSales}}{\text{ActualQty.}}\)
  - \(\₹61,33,760 \div 51,200 \text{ units}\)
  - \(\₹119.80\)

(v) **Comment**

**Direct Labour Rate Variance**

Adverse Labour Rate Variance indicates that the labour rate per hour paid is more than the set standard. The reason may include among other things such as:
While setting standard, the current/future market conditions like pending labour negotiation/cases, has not been considered (or predicted) correctly.

The labour may have been told that their wage rate will be raised or bonus will be paid if they work efficiently.

**Direct Labour Efficiency Variance**

It indicates that the workers has produced actual production quantity in less time than the time allowed. The reason for favourable labour efficiency variance may include among the other things as follows:

1. While setting standard, workers efficiency could not be estimated properly, this may happen due to non-observance of time and motion study.
2. The workers may be new in the factory, hence, efficiency could not be predicated properly.
3. The foreman or personnel manager responsible for labour efficiency, while providing his/her input at the time of budget/standard, has adopted conservative approach.
4. The increase in the labour rate might have encouraged the labours to do work more efficiently.

In this particular case it may have happened that since labour payment has been increased labour efficiency has also been increased. In a nutshell because of additional labour rate (Adverse), labour efficiency has gone up (Favourable)

---

**Missing/Required Information from Given Inputs and Variances**

**Problem-15**

KYC Ltd. uses a standard absorption costing system. The following details have been extracted from its budget for year 2013-14.

- Fixed Overhead Cost: ₹7,20,000
- Production: 36,000 units

In 2013-14 the Fixed Overhead Cost was over-absorbed by ₹3,200 and the Fixed Overhead Expenditure Variance was ₹20,000(F).

**Required**

What was the actual number of units produced in 2013-14?
Solution

Fixed Overhead Expenditure Variance = Budgeted Fixed Overheads – Actual Fixed Overheads

\₹20,000 (F) = ₹7,20,000 – Actual Fixed Production Overheads

Actual Fixed Overheads = ₹7,00,000

Absorbed Fixed Overheads = Actual Fixed Overheads + Over Absorbed Fixed Overheads

= ₹7,00,000 + ₹3,200

= ₹7,03,200

Standard Absorption Rate per unit = ₹7,20,000 / 36,000 units

= ₹20

So, Actual Number of Units = ₹7,03,200 / ₹20

= 35,160 units

Problem-16

S. Ltd. operates a system of standard costing in respect of one of its products which is manufactured within a single cost centre, the following information is available:

Standard price of material is ₹2 per litre. The standard wage rate is ₹6 per hour and 5 hours are allowed to produce one unit. Fixed production overhead is absorbed at the rate of 100% of direct wages cost.

During the month just ended the following occurred -

<table>
<thead>
<tr>
<th></th>
<th>Favourable (₹)</th>
<th>Adverse (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material Price</td>
<td>8,000</td>
<td>-</td>
</tr>
<tr>
<td>Direct Material Usage</td>
<td>-</td>
<td>5,000</td>
</tr>
<tr>
<td>Direct Labour Rate</td>
<td>-</td>
<td>5,760</td>
</tr>
</tbody>
</table>

Actual Price (paid for material purchased)…………………………. 1.95 per litre
Total Direct Wages Cost…………………………………………. 1,56,000
Fixed Production Overhead……………………………………... 1,58,000
5.74 Advanced Management Accounting

<table>
<thead>
<tr>
<th>Direct Labour Efficiency</th>
<th>2,760</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Production Overhead Expenditure</td>
<td>-</td>
<td>8,000</td>
</tr>
</tbody>
</table>

**Required**

Calculate the following for the month-

(i) Budgeted output in units.
(ii) Number of litres purchased.
(iii) Number of litres used above standard allowed.
(iv) Actual units produced.
(v) Actual hours worked.
(vi) Average actual wage rate per hour.

**Solution**

**Budgeted output in units**

\[
\text{Fixed Overhead Expenditure} = \text{Budgeted Fixed Overheads} - \text{Actual Fixed Overheads} \\
\text{Variance} \\
\Rightarrow \text{₹8,000 (A)} = \text{Budgeted Output} \times (₹ 6 \times 5 \text{ hrs.}) - ₹1,58,000 \\
\Rightarrow \text{Budgeted Output} = 5,000 \text{ units}
\]

**Number of litres purchased**

\[
\text{Material Price Variance} = \text{Actual Quantity} \times (\text{Std. Price} - \text{Actual Price}) \\
\Rightarrow \text{₹8,000 (F)} = \text{No. of litres purchased} \times (₹ 2 - ₹ 1.95) \\
\Rightarrow \text{No. of litres purchased} = 1,60,000 \text{ litres}
\]

**Number of litres used above standard allowed**

\[
\text{Material Usage Variance} = \text{Standard Price} \times (\text{Standard Quantity} - \text{Actual Quantity}) \\
\Rightarrow \text{₹5,000 (A)} = ₹ 2 \times (\text{Standard Quantity} - 1,60,000 \text{ litres}) \\
\Rightarrow \text{Standard Quantity} = 1,57,500 \text{ litres} \\
\Rightarrow \text{No. of litres above Standard} = 1,60,000 \text{ litres} - 1,57,500 \text{ litres} \\
= 2,500 \text{ litres}
\]

**Actual units produced**

\[
\text{Labour Cost Variance} = \text{Rate Variance} + \text{Efficiency Variance} \\
= \text{₹ 5,760 (A)} + \text{₹ 2,760 (F)}
\]
Labour Cost Variance = Standard Cost – Actual Cost
⇒ 3,000 (A) = Actual Output × (₹ 6 × 5 hrs.) – ₹1,56,000
Rightarrow Actual Output = 5,100 units

Actual hours worked

Labour Efficiency Variance = Standard Rate × (Standard Hours – Actual Hours)
⇒ 2,760 (F) = ₹ 6 x (5,100 units × 5 hrs. – Actual Hours)
⇒ Actual Hours = 25,040 hours

Average actual wage rate per hours

Labour Rate Variance = Actual Hours × (Standard Rate – Actual Rate)
⇒ 5,760 (A) = 25,040 hours × (₹ 6 – Actual Rate)
⇒ Actual Rate = ₹ 6.23...per hour

Problem-17

The details regarding a product manufactured by ZED & Co. for the last one week are as follows:

<table>
<thead>
<tr>
<th>Standard Cost (for one unit)</th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Materials</td>
<td>(10 unit @ ₹ 1.50)</td>
</tr>
<tr>
<td>Direct Wages</td>
<td>(5 hours @ ₹ 8.00)</td>
</tr>
<tr>
<td>Production Overheads</td>
<td>(5 hours @ ₹ 10.00)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Actual (for whole activity)</th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Materials</td>
<td>6,435</td>
</tr>
<tr>
<td>Direct Wages</td>
<td>16,324</td>
</tr>
<tr>
<td>Direct Materials</td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>585 (A)</td>
</tr>
<tr>
<td>Usage</td>
<td>375 (F)</td>
</tr>
<tr>
<td>Direct Wages</td>
<td></td>
</tr>
<tr>
<td>Rate</td>
<td>636 (F)</td>
</tr>
<tr>
<td>Usage</td>
<td>360 (A)</td>
</tr>
</tbody>
</table>
Required
(i) Calculate actual output units;
(ii) Calculate actual price of material per unit;
(iii) Calculate actual wage rate per labour hour;
(iv) Calculate the amount of production overhead incurred, and
(v) Calculate the production overhead efficiency variance.

Solution

COMPUTATION OF REQUIREMENTS

Actual output units
Material Cost Variance = Price Variance + Usage Variance
= ₹ 585 (A) + ₹ 375 (F)
= ₹ 210 (A)

Material Cost Variance = Standard Cost of Standard Quantity for Actual Production (refer as Standard Cost) – Actual Cost

Actual Output = 415 units

Material Usage Variance = Standard Price × (Standard Quantity – Actual Quantity)

Actual Quantity = 3,900 units

Actual price of material per unit

Actual price of Material per unit = \[
\frac{\text{Actual Cost}}{\text{Actual Quantity}}\]

= \[
\frac{₹6,435}{3,900 \text{ units}}\]

= ₹ 1.65
**Actual wage rate per labour hour**

Labour Rate Variance = Actual Hours × (Standard Rate – Actual Rate)

- ₹636 (F) = Actual Hours × (₹8 – Actual Rate)
- ₹636 (F) = Actual Hours × ₹8 – Actual Cost
- ₹636 (F) = Actual Hours × ₹8 – ₹16,324

Actual Hours = 2,120 Hours

Actual Wage Rate per hour = \(
\frac{\text{Actual Wages}}{\text{Actual Hours}}
\)

= \frac{₹16,324}{2,120 hours}

= ₹7.7 per hour

**The amount of production overhead incurred**

Production Overhead Cost = Expenditure Variance + Volume Variance

Variance = ₹400 (F) + ₹750 (F)

= ₹1,150 (F)

Production Overhead Cost = Absorbed Overheads – Actual Overheads

Variance

- ₹1,150 (F) = ₹50 × 415 units – Actual Overheads
- Actual Overheads = ₹19,600

**The production overhead efficiency variance**

Production Overhead Efficiency Variance = Absorbed Overheads – Budgeted Overheads for Actual Hours

= ₹10 × (5 Hours × 415 units) – ₹10 × 2,120 Hours

= ₹450 (A)

**Problem-18**

A company operates a standard cost system to control the variable works cost of its only product. The following are the details of actual production, costs and variances for November, 2015.
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Production and cost (actual)

Production......................................................10,000 units
Direct Materials (1,05,000 kg.)............................₹ 5,20,000
Direct Labour (19,500 hrs.).................................₹ 3,08,000
Variable Overheads...........................................₹ 4,10,000

Cost variances

Direct materials – Price.................................₹ 5,000 (F)
Direct materials – Usages.................................₹ 25,000 (A)
Direct labour – Rate.......................................₹ 15,500 (A)
Direct labour – Efficiency...............................₹ 7,500 (F)
Variable overheads........................................ ₹ 10,000 (A)

The Cost Accountant finds that the original standard cost data for the product is missing from the cost department files. The variance analysis for December, 2015 is held up for want of this data.

Required

(i) Calculate- Standard price per kg. of direct material
(ii) Calculate- Standard quantity for each unit of output
(iii) Calculate- Standard rate of direct labour hour
(iv) Calculate- Standard time for actual production
(v) Calculate- Standard variable overhead rate

Solution

(i) Standard Price per Kg. of Direct Material

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

⇒ 5,000 (F) = Standard Cost of Actual Quantity – ₹ 5,20,000

Standard Cost of Actual Quantity = ₹ 5,20,000 + ₹ 5,000
= ₹ 5,25,000

Standard Cost of Actual Quantity = Standard Price per Kg. × Actual Quantity
(i) **Standard Price per Kg.**

\[
\text{Standard Price per Kg.} = \frac{\text{₹ 5,25,000}}{1,05,000 \text{ Kg.}}
\]

\[\approx \text{₹ 5}\]

(ii) **Standard Quantity for each unit of output**

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

\[\text{Material Usage Variance} = \text{Standard Cost of Standard Quantity for Actual Output} - \text{Standard Cost of Actual Quantity}\]

\[\Rightarrow 25,000 \text{ (A)} = \text{Standard Cost of Standard Quantity for Actual Output} - \text{₹ 5,25,000}\]

Standard Cost of Standard Quantity for Actual Output

\[= \text{₹ 5,25,000} - \text{₹ 25,000}\]

\[= \text{₹ 5,00,000}\]

Standard Cost of Standard Quantity for Actual Output

\[= \text{Standard Price per Kg.} \times \text{Standard Quantity for Actual Output}\]

\[\Rightarrow \text{₹ 5,00,000} = \text{₹ 5} \times \text{Standard Quantity for Actual Output}\]

Standard Quantity for Actual Output

\[= \frac{\text{₹ 5,00,000}}{\text{₹ 5}}\]

\[= 1,00,000 \text{ Kg.}\]

Standard Quantity for each unit of output

\[= \frac{1,00,000 \text{ Kg.}}{10,000 \text{ units}}\]

\[= 10 \text{ Kg.}\]

(iii) **Standard Rate of Direct Labour Hour**

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

\[\Rightarrow 15,500 \text{ (A)} = \text{Standard Cost of Actual Time} - \text{₹ 3,08,000}\]

Standard Cost of Actual Time

\[= \text{₹ 3,08,000} - \text{₹ 15,500}\]

\[= \text{₹ 2,92,500}\]
Standard Cost of Actual Time

\[ \text{Standard Cost of Actual Time} = \text{Standard Rate per hr.} \times \text{Actual Hours} \]

\[ \Rightarrow \text{₹ 2,92,500} = \text{Standard Rate per hr.} \times 19,500 \text{ hrs.} \]

Standard Rate per hr.

\[ = \left( \frac{\text{₹ 2,92,500}}{19,500 \text{ hrs.}} \right) \]

\[ = \text{₹ 15} \]

(iv) Standard Time for Actual Production

Labour Efficiency Variance

\[ = \text{Standard Cost of Standard Time for Actual Production} - \text{Standard Cost of Actual Time} \]

\[ \Rightarrow 7,500 \text{ (F)} = \text{Standard Cost of Standard Time for Actual Production} - \text{₹ 2,92,500} \]

Standard Cost of Standard Time for Actual Production

\[ = \text{₹ 2,92,500 + ₹ 7,500} \]

\[ = \text{₹ 3,00,000} \]

(v) Standard Variable Overhead Rate

Variable Overhead Variance

\[ = \text{Standard Variable Overheads for Production} - \text{Actual Variable Overheads} \]

\[ \Rightarrow 10,000 \text{ (A)} = \text{Standard Variable Overheads for Production} - \text{₹ 4,10,000} \]

Standard Variable Overheads for Production

\[ = \text{₹ 4,10,000} - \text{₹ 10,000} \]

\[ = \text{₹ 4,00,000} \]
Standard Variable Overheads for Production

\[ \text{Standard Variable Overhead Rate per Unit} \times \text{Actual Production (Units)} \]

\[ \implies \text{₹ 4,00,000} \]

Standard Variable Overhead Rate per unit

\[ \frac{\text{₹ 4,00,000}}{10,000 \text{ units}} \]

\[ = \text{₹ 40} \]

Or

Standard Variable Overheads for Production

\[ \text{Standard Variable Overhead Rate per Hour} \times \text{Standard Hours for Actual Production} \]

\[ \implies \text{₹ 4,00,000} \]

Standard Variable Overhead Rate per hour

\[ \frac{\text{₹ 4,00,000}}{20,000 \text{ hrs}} \]

\[ = \text{₹ 20} \]

**Problem-19**

*Prince Edward & Co. used a full standard cost system with raw materials inventory carried at Standard. The following data were taken from the records of the company for the year ended 31.12.2013:*

<table>
<thead>
<tr>
<th>Description</th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening raw materials inventory</td>
<td>300</td>
</tr>
<tr>
<td>Closing raw materials inventory</td>
<td>250</td>
</tr>
<tr>
<td>Net purchases</td>
<td>410</td>
</tr>
<tr>
<td>Material price variance</td>
<td>10 (A)</td>
</tr>
<tr>
<td>Material usage variance</td>
<td>20 (A)</td>
</tr>
<tr>
<td>Direct labour cost (Actual)</td>
<td>900</td>
</tr>
<tr>
<td>Direct labour cost at standard</td>
<td>840</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Actual overhead cost incurred</th>
<th>875</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overheads cost variance</td>
<td>45 (F)</td>
</tr>
<tr>
<td>Opening work-in-progress inventory</td>
<td>120</td>
</tr>
<tr>
<td>Closing work-in-progress inventory</td>
<td>140</td>
</tr>
<tr>
<td>Opening finished goods inventory</td>
<td>360</td>
</tr>
<tr>
<td>Cost of goods sold reported</td>
<td>2,240</td>
</tr>
</tbody>
</table>

Note: “F” denotes favourable and “A” denotes adverse.

Required

Compute-

1. Raw material Purchases at standard.
2. Raw materials consumed at standard.
3. Labour cost variance.
4. Standard overhead costs.
5. Total manufacturing cost at standard.
6. Cost of goods manufactured.
7. Cost of products sold to customers.
8. Closing finished goods inventory.

Solution

COMPUTATION OF REQUIREMENTS

1. Raw Material Purchases at Standard (₹)
   - Net Purchases at actual 410
   - Less: Material Price Variance (A) 10
   - 400

2. Raw Materials Consumed at Standard (₹)
   - Opening Stock at Standard 300
   - Add: Purchases at Standard (as per 1) 400
   - 700
   - Less: Closing Stock at Standard 250
   - 450
3. **Labour Cost Variance**

   Direct Labour Cost at Standard \( 840 \)  
   Less: Actual Direct Labour Cost \( 900 \)  
   \( \text{Adverse} \quad 60 \)  

4. **Standard Overhead Cost**

   Actual Overhead Cost \( 875 \)  
   Add: Overhead Cost Variance (Favourable) \( 45 \)  
   \( 920 \)  

5. **Total Manufacturing Cost at Standard**

   Standard Raw Material Cost \( 450 \)  
   Standard Direct Labour Cost \( 840 \)  
   Standard Overhead Cost \( 920 \)  
   \( 2,210 \)  

6. **Cost of Goods Manufactured (at Standard)**

   Opening WIP (at Standard) \( 120 \)  
   Add: Total Cost of Goods Manufactured (at Standard) \( 2,210 \)  
   Less: Closing WIP (at Standard) \( 140 \)  
   \( 2,190 \)  

7. **Cost of Products Sold to Customers (at Standard)**

   Cost of Goods Sold Reported \( 2,240 \)  
   Less: Adverse Cost Variances  
   Material Price Variance \( 10(A) \)  
   Material Usage Variance \( 20(A) \)  
   Direct Labour Cost Variance \( 60(A) \)  
   \( 90 \)  
   Add: Favourable Cost Variances  
   Overhead Cost Variance \( 45 \)  
   \( 2,195 \)
8. **Closing Stock of Finished Goods Inventory at Standard**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount (in ₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening Finished Goods Inventory (at Standard)</td>
<td>360</td>
</tr>
<tr>
<td>Add: Cost of Goods Manufactured (at Standard)</td>
<td>2,190</td>
</tr>
<tr>
<td>Less: Cost of Products Sold to Customers (at Standard)</td>
<td>2,195</td>
</tr>
<tr>
<td>Closing Finished Goods Inventory (at Standard)</td>
<td>355</td>
</tr>
</tbody>
</table>

**Problem-20**

The following are the information regarding overheads of a company:

(a) Overheads cost variance = ₹2,800 (A)
(b) Overheads volume variance = ₹2,000 (A)
(c) Budgeted overheads = ₹12,000
(d) Actual overhead recovery rate = ₹8 per hour
(e) Budgeted hours for the period = 2,400 hours

**Required**

Compute the following-

(i) Overheads expenditure variance.
(ii) Actual incurred overheads.
(iii) Actual hours for actual production.
(iv) Overheads capacity variance.
(v) Overheads efficiency variance.
(vi) Standard hours for actual production.

**Solution**

**BASIC WORKINGS**

- Overheads Cost Variance = ₹2,800 (A)
- Overheads Volume Variance = ₹2,000 (A)
- Budgeted Overheads = ₹12,000
- Actual Overhead Recovery Rate = ₹8 per hour
- Budgeted Hours for the period = 2,400 hours
COMPUTATION OF REQUIREMENTS

Overheads expenditure variance

Overheads Expenditure Variance = Overheads Cost Variance (–) Overheads Volume Variance
= ₹ 2,800 (A) – ₹ 2,000 (A)
= ₹ 800 (A)

Actual incurred overheads

Overheads Expenditure Variance = Budgeted Overheads (–) Actual Overheads
⇒ ₹ 800 (A) = ₹ 12,000 (–) Actual Overheads
Therefore, Actual Overheads = ₹ 12,800

Actual hours for actual production

Actual hours for actual production = \( \frac{\text{Actual Overheads}}{\text{Actual Overhead Recovery Rate Per Hour}} \)
= \( \frac{₹ 12,800}{₹ 8} \)
= 1,600 hours

Overheads capacity variance

Overheads Capacity Variance = Budgeted Overheads for Actual Hours (–) Budgeted Overheads
= ₹ 5 × 1,600 hrs. – ₹ 12,000
= ₹ 8,000 – ₹ 12,000
= ₹ 4,000 (A)

Overheads efficiency variance

Overheads Efficiency Variance = Absorbed Overheads (–) Budgeted Overheads for Actual Hours
= ₹ 10,000 – ₹ 5 × 1,600 hours
= ₹ 2,000 (F)
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**Standard hours for actual production**

\[
\text{Standard hours for actual output} = \frac{\text{Absorbed Overheads}}{\text{Standard Overhead Rate per hour}}
\]

\[
= \frac{\text{ ₹10,000}}{\text{ ₹5}}
\]

\[
= 2,000 \text{ hours}
\]

**WORKING NOTE**

Overhead Cost Variance  =  Absorbed Overheads (–) Actual Overheads

\[
\Rightarrow \text{ ₹2,800 (A)} = \text{ Absorbed Overheads (–) ₹12,800}
\]

\[
\Rightarrow \text{ Absorbed Overheads} = \text{ ₹10,000}
\]

Standard Rate per hour  =  \[
= \frac{\text{ ₹12,000}}{\text{ 2,400 hours}}
\]

=  ₹5

**Problem-21**

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

<table>
<thead>
<tr>
<th></th>
<th>Product R</th>
<th>Product S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Sales Qty. (Units)</td>
<td>? ? ?</td>
<td>400</td>
</tr>
<tr>
<td>Actual Sales Qty. (Units)</td>
<td>500</td>
<td>? ? ?</td>
</tr>
<tr>
<td>Standard Price/Unit</td>
<td>₹12</td>
<td>₹15</td>
</tr>
<tr>
<td>Actual Price/Unit</td>
<td>₹15</td>
<td>₹20</td>
</tr>
<tr>
<td>Sales Volume Variance</td>
<td>₹1,200 (F)</td>
<td>? ? ?</td>
</tr>
</tbody>
</table>

Sales Mix Variance for both the products together was ₹450 (F). 'F' denotes favourable.
Solution

Statement Showing “Standard & Actual Data (incomplete)”

<table>
<thead>
<tr>
<th>Product</th>
<th>Standard / Budgeted Data</th>
<th>Actual Data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Qty. (units)</td>
<td>Price (per unit)</td>
</tr>
<tr>
<td>R</td>
<td>??</td>
<td>₹ 12</td>
</tr>
<tr>
<td>S</td>
<td>400</td>
<td>₹ 15</td>
</tr>
<tr>
<td>Total</td>
<td>??</td>
<td>??</td>
</tr>
</tbody>
</table>

Product: R

Sales Price Variance

= Actual Qty. × (Actual Price – Budgeted Price)

= 500 units × (₹ 15 – ₹ 12)

= ₹ 1,500 (F)

Sales Volume Variance

= Budgeted Price × (Actual Qty. – Budgeted Qty.)

= ₹ 1,200 (F) = ₹ 12 × (500 units – Budgeted Qty.)

⇒ Budgeted Qty. = 400 units

Sales Value Variance

= Sales Price Variance + Sales Volume Variance

= ₹ 1,500 (F) + ₹ 1,200 (F)

= ₹ 2,700 (F)

The table can now be presented as follows. Assumed Actual Quantity of S is ‘T’ units.

<table>
<thead>
<tr>
<th>Product</th>
<th>Standard / Budgeted Data</th>
<th>Actual Data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Qty. (units)</td>
<td>Price (per unit)</td>
</tr>
<tr>
<td>R</td>
<td>400</td>
<td>₹ 12</td>
</tr>
<tr>
<td>S</td>
<td>400</td>
<td>₹ 15</td>
</tr>
<tr>
<td></td>
<td>800</td>
<td>10,800</td>
</tr>
</tbody>
</table>

Sales Mix Variance = Total Actual Qty (units) × (Average Budgeted Price per unit of Actual Mix – Average Budgeted Price per unit of Budgeted Mix)
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\[ \text{Rs} \ 450 \ (F) = (500 \text{ units} + T \text{ units}) \times \left( \frac{500 \text{ units} \times \text{Rs} \ 12 + T \text{ units} \times \text{Rs} \ 15}{500 \text{ units} + T \text{ units}} \right) - \left( \text{Rs} \ 10,800 \right) \]

\[ \text{Rs} \ 450 \ (F) = 6,000 + 15T - 13.5 \times (500 + T) \]

\[ T = 800 \text{ units} \]

Statement Showing “Standard & Actual Data (Complete)"

<table>
<thead>
<tr>
<th>Product</th>
<th>Standard / Budgeted Data</th>
<th>Actual Data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Qty. (units)</td>
<td>Price (per unit)</td>
</tr>
<tr>
<td>R</td>
<td>400</td>
<td>₹ 12</td>
</tr>
<tr>
<td>S</td>
<td>400</td>
<td>₹ 15</td>
</tr>
<tr>
<td></td>
<td>800</td>
<td>₹ 15</td>
</tr>
</tbody>
</table>

**Product: S**

Sales Price Variance = Actual Qty. × (Actual Price – Budgeted Price)
= 800 units × (₹ 20 – ₹ 15)
= ₹ 4,000 (F)

Sales Volume Variance = Budgeted Price × (Actual Qty. – Budgeted Qty.)
= ₹ 15 × (800 units – 400 units)
= ₹ 6,000 (F)

Sales Value Variance = Sales Price Variance + Sales Volume Variance
= 4,000 (F) + 6,000 (F)
= ₹ 10,000 (F)

**Problem-22**

*M Star Ltd uses standard costing system in manufacturing of its single product ‘MGO’. The standard cost per unit of ‘MGO’ is as follows.*

\[\text{Rs}\]

Direct Material – 2 metres @ ₹ 6 per metre.................................12.00
Direct Labour – 1 hour @ ₹ 4.40 per hour.........................................4.40
Variable Overhead – 1 hour @ ₹ 3 per hour.................................3.00

19.40
During July, 2013, 6,000 units of M were procured and the related data are as under:

Direct material acquired – 19,000 metres @ 5.70 per metre.

Material consumed 12,670 meters.

Direct labour - ? hours @ ? per hour................................. ₹ 27,950

Variable overheads incurred........................................... ₹ 20,475

The variable overhead efficiency variance is ₹ 1,500 adverse. Variable overheads are based on direct labour hours. There was no stock of raw – material in the beginning.

**Required**

Compute the missing figures and work out all the relevant variances.

**Solution**

**WORKING NOTE**

<table>
<thead>
<tr>
<th>Standard Cost</th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Materials (6,000 units × ₹ 12)</td>
<td>72,000</td>
</tr>
<tr>
<td>Direct Labour (6,000 units × ₹ 4.40)</td>
<td>26,400</td>
</tr>
<tr>
<td>Variable Overheads (6,000 units × ₹ 3)</td>
<td>18,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Actual Cost</th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material (12,670 metres × ₹ 5.70)</td>
<td>72,219</td>
</tr>
<tr>
<td>Direct Wages</td>
<td>27,950</td>
</tr>
<tr>
<td>Variable Overheads</td>
<td>20,475</td>
</tr>
</tbody>
</table>

**WORKING FOR FINDING - MISSING FIGURES**

**Actual Labour Hours**

Variable Overhead Efficiency Variance = Standard Variance Overhead Rate per hour × (Std. Hours for Actual Output – Actual Hours)

⇒ ₹ 1,500 (Adverse) = ₹ 3 × (6,000 units × 1 hour – Actual Hours)

⇒ Actual Hours = 6,500 hours

**Actual Wage Rate per hour**

= \[
\frac{\text{ActualWagesPaid}}{\text{ActualHours}}
\]

= \[
\frac{₹27,950}{6,500\text{hours}} = ₹ 4.30
\]
COMPUTATION OF VARIANCES

Material Variances
1. Material Cost Variance
   = Standard Cost – Actual Cost
   = ₹ 72,000 – ₹ 72,219
   = ₹ 219 (A)

2. Material Price Variance
   = Actual Quantity × (Standard Price – Actual Price)
   = 12,670 metres × (₹ 6 – ₹ 5.70)
   = ₹ 3,801 (F)

3. Material Usage Variance
   = Standard Price × (Standard Qty. – Actual Qty.)
   = ₹ 6 × (12,000 metres – 12,670 metres)
   = ₹ 4,020 (A)

Labour Variances
1. Labour Cost Variance
   = Standard Cost – Actual Cost
   = ₹ 26,400 – ₹ 27,950
   = ₹ 1,550 (A)

2. Labour Rate Variance
   = Actual Hours × (Standard Rate – Actual Rate)
   = 6,500 hours × (₹ 4.40 – ₹ 4.30)
   = ₹ 650 (F)

3. Labour Efficiency Variance
   = Standard Rate × (Standard Hours – Actual Hours)
   = ₹ 4.40 × (6,000 hours – 6,500 hours)
   = ₹ 2,200 (A)

Variable Overhead Variances
1. Total Variable Overhead Variance
   = Standard Variable Overheads for Production – Actual Variable Overheads
   = ₹ 18,000 – ₹ 20,475
   = ₹ 2,475 (A)

2. Variable Overhead Efficiency Variance
   = Standard Variable Overhead Rate per hour ×
   (Std. Hrs. for Actual Output – Actual Hours)
   = ₹ 3 × (6,000 hours – 6,500 hours)
   = ₹ 1,500 (A)
3. **Variable Overhead Expenditure** = Budgeted Variable Overheads for Actual Hours – Actual Variable Overheads

\[
3 \times 6,500 \text{ hours} - 20,475 = 975 \text{ (A)}
\]

**Problem-23**

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

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard price of raw material (₹/kg.)</strong></td>
<td>24</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td><strong>Actual input (kg.)</strong></td>
<td>?</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td><strong>Actual output (kg.)</strong></td>
<td></td>
<td></td>
<td>?</td>
</tr>
<tr>
<td><strong>Actual price ₹/kg.</strong></td>
<td>30</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td><strong>Standard input quantity (kg.)</strong></td>
<td>?</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td><strong>Yield variance (sub usage)</strong></td>
<td></td>
<td></td>
<td>270 (A)</td>
</tr>
<tr>
<td><strong>Mix variance</strong></td>
<td></td>
<td></td>
<td>?</td>
</tr>
<tr>
<td><strong>Usage variance</strong></td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td><strong>Price variance</strong></td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td><strong>Cost variance</strong></td>
<td>0</td>
<td>?</td>
<td>1,300 (A)</td>
</tr>
</tbody>
</table>

**Required**

Compute the missing information indicated by “?” based on the data given above.

**Solution**

**WORKING FOR FINDING – MISSING FIGURES**

\[
\begin{align*}
\text{Cost Variance } A &= 0 \\
\text{Cost Variance } (A+B) &= ₹1,300 \text{ (A)} \\
\text{Yield Variance } (A+B) &= ₹270 \text{ (A)}
\end{align*}
\]
## Standard Cost and Actual Cost (Incomplete Information)

<table>
<thead>
<tr>
<th>Raw Material</th>
<th>Standard Data</th>
<th>Actual Data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Qty. (Kg.) [SQ]</td>
<td>Price (₹) [SP]</td>
</tr>
</tbody>
</table>

**Material Cost Variance**
\[
\text{A} = \text{Standard Cost} – \text{Actual Cost} \\
\Rightarrow 0 = (\text{SQ}_{A} \times 24 - \text{AQ}_{A} \times 30) \\
\Rightarrow SQA = 1.25 \text{AQ}_{A}
\]

**Material Yield Variance**
\[
\text{(A+B)} = \text{Average Standard Price per unit of Standard Mix} \times [\text{Total Standard Quantity (units) – Total Actual Quantity (units)}] \\
\Rightarrow \text{₹270 (A)} = \left(\frac{24 \times \text{SQ}_{A} + 30 \times \text{SQ}_{B}}{\text{SQ}_{A} + \text{SQ}_{B}}\right) \times [(\text{SQ}_{A} + \text{SQ}_{B}) - (\text{AQ}_{A}+70)] \\
\text{SQ}_{A} = \text{SQ}_{B} \text{ as Standard Mix is in ratio 1:1}
\]

\[
\Rightarrow \text{₹270 (A)} = \left(\frac{24 \times \text{SQ}_{A} + 30 \times \text{SQ}_{A}}{\text{SQ}_{A} + \text{SQ}_{A}}\right) \times [(\text{SQ}_{A} + \text{SQ}_{A}) - (\text{AQ}_{A}+70)] \\
\Rightarrow \text{₹270 (A)} = 27 \times [2 \times \text{SQ}_{A} - (\text{AQ}_{A}+70)] \\
\Rightarrow \text{₹270 (A)} = 27 \times [2 \times 1.25 \text{AQ}_{A} - (\text{AQ}_{A}+70)] \\
\Rightarrow \text{AQ}_{A} = 40 \text{ Kg}.
\]

As \text{SQ}_{A} = 1.25 \text{AQ}_{A} = 1.25 \times 40 \text{ Kg.} = 50 \text{ Kg.}

As \text{SQ}_{B} = \text{SQ}_{A} = 50 \text{ Kg.}

**Cost Variance**
\[
\Rightarrow 1,300 (A) = (50 \text{ Kg.} \times ₹ 24 + 50 \text{ Kg.} \times ₹ 30) - (40 \text{ Kg.} \times ₹ 30+70 \text{ Kg.} \times AP_{B}) \\
\Rightarrow AP_{B} = ₹ 40
\]
Standard Cost and Actual Cost (Complete Information)

<table>
<thead>
<tr>
<th>Raw Material</th>
<th>Standard Data</th>
<th>Actual Data</th>
<th>Std. Cost of Actual Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Qty. (Kg.) [SQ]</td>
<td>Price (₹) [SP]</td>
<td>Amount (₹) [SQ x SP]</td>
</tr>
<tr>
<td>A</td>
<td>50</td>
<td>24</td>
<td>1,200</td>
</tr>
<tr>
<td>B</td>
<td>50</td>
<td>30</td>
<td>1,500</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td></td>
<td>2,700</td>
</tr>
</tbody>
</table>

COMPUTATION OF VARIANCES

Material Cost Variance
\[
= \text{Standard Cost} - \text{Actual Cost} \\
\ = SQ \times SP - AQ \times AP \\
\]

\(A\) = 1,200 - 1,200
\ = 0

\(B\) = 1,500 - 2,800
\ = 1,300 (A)

Total = 0 + 1,300 (A)
\ = 1,300 (A)

Material Price Variance
\[
= \text{Standard Cost of Actual Quantity} - \text{Actual Cost} \\
\ = AQ \times SP - AQ \times AP \\
\] Or
\[
\ = AQ \times (SP - AP) \\
\]

\(A\) = 40 Kg. \times (24.00 - 30.00)
\ = 240 (A)

\(B\) = 70 Kg. \times (30.00 - 40.00)
\ = 700 (A)

Total = 240 (A) + 700 (A)
\ = 940 (A)

Material Usage Variance
\[
= \text{Standard Cost of Standard Quantity for Actual Output} - \text{Standard Cost of Actual Quantity} \\
\ = SQ \times SP - AQ \times SP \\
\]
Or

\[ \text{Material Mix Variance} = \text{Total Actual Quantity (units)} \times (\text{Average Standard Price per unit of Standard Mix} - \text{Average Standard Price per unit of Actual Mix}) \]

\[ = 110 \text{ Kg.} \times \left( \frac{\text{\₹ 2,700}}{100 \text{ Kg.}} - \frac{\text{\₹ 3,060}}{110 \text{ Kg.}} \right) \]

\[ = \text{\₹ 90 (A)} \]

\[ \text{Material Yield Variance} = \text{Average Standard Price per unit of Standard Mix} \times [\text{Total Standard Quantity (units)} - \text{Total Actual Quantity (units)}] \]

\[ = \left( \frac{\text{\₹ 2,700}}{100 \text{ Kg.}} \right) \times (100 \text{ Kg.} - 110 \text{ Kg.}) \]

\[ = \text{\₹ 270 (A)} \]

\[ \text{Standard Output} = \text{Standard Input} - \text{Standard Loss} \]

\[ = 100 \text{ Kg.} - 10 \text{ Kg.} \]

\[ = 90 \text{ Kg.} \]

\[ \text{Actual Output} = 90 \text{ Kg.} \]

*(Actual Output and Standard Output are always equal numerically in any Material Variance Analysis)*

**Problem-24**

*Worldwide LTD. is engaged in marketing of wide range of consumer goods. M, N, O and P are the zonal sales officers for your zones. The company fixes annual sales target for them individually.*

*You are furnished with the following:*

1. The standard costs of sales target in respect of M, N, O and P are \text{\₹ 5,00,000, \₹ 3,75,000, \₹ 4,00,000 and \₹ 4,25,000 respectively.}
Standard Costing 5.95

(2) M, N, O and P respectively earned ₹ 29,900, ₹ 23,500, ₹ 24,500 and ₹ 25,800 as commission at 5% on actual sales effected by them during the previous year.

(3) The relevant variances as computed by a qualified cost accountant are as follows:

<table>
<thead>
<tr>
<th>Particulars</th>
<th>M (₹)</th>
<th>N (₹)</th>
<th>O (₹)</th>
<th>P (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Price Variance</td>
<td>4,000 (F)</td>
<td>6,000 (A)</td>
<td>5,000 (A)</td>
<td>2,000 (A)</td>
</tr>
<tr>
<td>Sales Volume Variance</td>
<td>6,000 (A)</td>
<td>26,000 (F)</td>
<td>15,000 (F)</td>
<td>8,000 (F)</td>
</tr>
<tr>
<td>Sales Margin Mix Variance</td>
<td>14,000 (A)</td>
<td>8,000 (F)</td>
<td>17,000 (F)</td>
<td>3,000 (A)</td>
</tr>
</tbody>
</table>

Note: (A) = Adverse variance and (F) = Favourable variance

Required

(i) Compute the amount of sales target fixed and the actual amount of margin earned in case of each of the zonal sales officer.

(ii) Evaluate the overall performance of these zonal sales officers taking three relevant base factors and then recommend whose performance is the best.

Solution

Statement Showing “Sales Target Fixed & Actual Margin”

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Zonal Sales Officers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td>Commissioned Earned</td>
<td>29,900</td>
</tr>
<tr>
<td>Actual Sales (Commission Earned / 5%)</td>
<td>5,98,000</td>
</tr>
<tr>
<td>Sales Price Variance</td>
<td>4,000(F)</td>
</tr>
<tr>
<td>Sales Volume Variance</td>
<td>6,000(A)</td>
</tr>
<tr>
<td>Sales Target (Budgeted Sales)</td>
<td>6,00,000</td>
</tr>
<tr>
<td>Standard Cost of Sales Target</td>
<td>5,00,000</td>
</tr>
<tr>
<td>Budgeted Margin</td>
<td>1,00,000</td>
</tr>
<tr>
<td>Sales Margin Mix Variance</td>
<td>14,000(A)</td>
</tr>
<tr>
<td>Sales Price Variance</td>
<td>4,000(F)</td>
</tr>
<tr>
<td>Actual Margin</td>
<td>90,000</td>
</tr>
</tbody>
</table>

Note: Since no information has been given about Sales Margin Quantity Variance, therefore for calculating actual margin the same has been assumed to be zero.
Statement Showing “Evaluation of the Performance of Zonal Sales Officers”

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Zonal Sales Officers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td>Efficiency towards the Target Sales</td>
<td></td>
</tr>
<tr>
<td>(a) Whether target achieved</td>
<td>No</td>
</tr>
<tr>
<td>(b) Actual Sales to Target Sales Ratio</td>
<td>99.67%</td>
</tr>
<tr>
<td>(c) Rank</td>
<td>IV</td>
</tr>
<tr>
<td>Margin Approach</td>
<td></td>
</tr>
<tr>
<td>(a) Margin Earned (₹)</td>
<td>90,000</td>
</tr>
<tr>
<td>(b) Rank</td>
<td>II</td>
</tr>
<tr>
<td>Margin Vs Sales Ratio</td>
<td></td>
</tr>
<tr>
<td>(a) Budgeted Margin/Sales Target Ratio</td>
<td>16.67%</td>
</tr>
<tr>
<td>(b) Actual Margin Vs Actual Sales Ratio</td>
<td>15.05%</td>
</tr>
<tr>
<td>(c) Rank</td>
<td>IV</td>
</tr>
</tbody>
</table>

An analysis on performance of four Zonal Sales Officers based on three base factors, the performance of officer O is the best.

Factors Contributing to Change in Profit

Problem-25

The working results of a Jems Ltd. for two corresponding years are shown below:

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Amount (₹ in lakhs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 2012</td>
</tr>
<tr>
<td>Sales</td>
<td>600</td>
</tr>
<tr>
<td>Cost of Sales:</td>
<td></td>
</tr>
<tr>
<td>Direct materials</td>
<td>300</td>
</tr>
<tr>
<td>Direct wages and variable overheads</td>
<td>180</td>
</tr>
<tr>
<td>Fixed overheads</td>
<td>80</td>
</tr>
<tr>
<td>Profit</td>
<td>40</td>
</tr>
</tbody>
</table>

In year 2013, there has been an increase in the selling price by 10 per cent. Following are the details of material consumption and utilization off direct labour hours during the two years:
### Required

(i) Taking year 2012 as base year, analyse the variances of year 2013 and also workout the amount which each variance has contributed to change in profit.

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

(iii) Calculate the percentage increase in selling price in the year 2013 that would be needed over the sale value of year 2013 to earn margin of safety of 45 per cent.

#### Solution

**COMPUTATION OF REQUIREMENTS**

(i) Reconciliation Statement Showing “Factors Contributed Change in Profit”

(\( \text{in lacs} \))

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Fav.</th>
<th>Adv.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in Contribution Due to Increase in Volume (( \text{₹ 140 lacs} - \text{₹ 120 lacs} )) (Refer to working note 3)</td>
<td>20</td>
<td>—</td>
</tr>
<tr>
<td>Sales Price Variance (Refer to working note 3)</td>
<td>70</td>
<td>—</td>
</tr>
<tr>
<td>Material Usage Variance (Refer to working note 4)</td>
<td>26</td>
<td>—</td>
</tr>
<tr>
<td>Material Price Variance (Refer to working note 4)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Direct Labour Rate Variance (Refer to working note 4)</td>
<td>—</td>
<td>14</td>
</tr>
<tr>
<td>Direct Labour Efficiency Variance (Refer to working note 4)</td>
<td>18</td>
<td>—</td>
</tr>
<tr>
<td>Fixed Overhead Expenditure Variance (Refer to working note 3)</td>
<td>—</td>
<td>70</td>
</tr>
<tr>
<td>Change in Profit</td>
<td>134</td>
<td>84</td>
</tr>
<tr>
<td>Change in Profit (Net)</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

(ii) **Break-Even Sales**

\[
\text{Break-even Sales} = \frac{\text{Fixed cost}}{\text{P/V ratio}}
\]

Year 2012

\[
= \frac{\text{₹ 80 lacs}}{\left( \frac{\text{₹ 120 lacs}}{\text{₹ 600 lacs}} \right)} = \frac{\text{₹ 400 lacs}}{}
\]
Year 2013 = \frac{\text{₹} 150 \text{lacs}}{\text{₹} 240 \text{lacs}} = \frac{\text{₹} 481.25 \text{lacs}}{\text{₹} 770 \text{lacs}}

(iii) Percentage Increase in Selling Price Needed Over the Sales Value of Year 2013 to Earn a Margin of Safety of 45% in Year 2013

Break-even Sales (%) = (100\% – 45\%) or 55\% of Total Sales

Required Contribution = \frac{\text{₹} 150 \text{lacs}}{55} \times 100 = \text{₹} 272.73 \text{lacs}

\begin{align*}
\text{BEP(\%)} &= \frac{\text{FixedCost(\})}}{\text{PVR}} \\
\text{Or} & \\
\text{BEP(\})} &= \frac{\text{FixedCost(\})}}{\text{PVR} \% \times \text{Sales(\})}} \\
\text{Or} & \\
\text{BEP(\})} \times 100 &= \frac{\text{FixedCost(\})}}{\text{PVR} \% \times \text{Sales(\})}} \times 100 \\
\text{Or} & \\
\text{BEP(\%)} &= \frac{\text{FixedCost(\})}}{\text{Contribution(\})} \times 100} \\
\text{Or} & \\
\text{Contribution(\})} &= \frac{\text{FixedCost(\})}}{\text{BEP(\%)} \times 100} \\
\end{align*}

Present Contribution = \text{₹} 240 \text{lacs}

Increase in Selling Price required = \text{₹} 32.72 \text{lacs} (\text{₹} 272.73 \text{lacs} – \text{₹} 240 \text{lacs})

Percentage increase in Selling Price over the Sales Value of Year 2013 = \frac{\text{₹} 32.72 \text{lacs}}{\text{₹} 770 \text{lacs}} \times 100 = 4.25\%

WORKING NOTES

1. Budgeted Sales in Year 2013

If Actual Sales in Year 2013 is \text{₹} 110 then Budgeted Sales is \text{₹} 100.

If Actual Sales in Year 2013 is \text{₹} 1 then Budgeted Sales = \frac{\text{₹} 100}{\text{₹} 110}
If Actual Sales in Year 2013 are ₹ 770,00,000 then Budgeted Sales are

\[
= \frac{\text{₹} 100}{\text{₹} 110} \times \text{₹} 7,70,00,000 = \text{₹} 700 \text{lacs}
\]

2. **Budgeted Figures of Direct Material; Direct Wages; and Variable Overhead Worked Out on the Basis of % of Sales in Year 2013**

Direct Material % to Sales (in Year 2012) = \(\frac{\text{Direct Material}}{\text{Sales}}\) = \(\frac{300}{600} \times 100 = 50\%\)

Budgeted figure of Direct Material (in Year 2013) = 50\% \times \text{₹} 700 \text{lacs} = 350 \text{lacs}

Direct Wages and Variable Overhead (% to sales in Year 2012) = \(\frac{\text{Direct Wages and Variable Overhead}}{\text{Sales}}\) = \(\frac{180}{600} \times 100 = 30\%\)

Budgeted figure of Direct Wages and Variable Overhead (in Year 2013) = 30\% \times \text{₹} 700 \text{lacs} = 210 \text{lacs}

3. **Statement of Figures Extracted from Working Results of Company**

(Figure in lacs of ₹)

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Year 2012 [Actual] (a)</th>
<th>Year 2013 [Budgeted] (b)</th>
<th>Year 2013 [Actual] (c)</th>
<th>Total [Variance] (d) = (c) – (b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales : (A)</td>
<td></td>
<td>700*</td>
<td>770</td>
<td>70 (F)</td>
</tr>
<tr>
<td>(*Refer to working note 1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Material...(a)</td>
<td>300</td>
<td>350*</td>
<td>324</td>
<td>26 (F)</td>
</tr>
<tr>
<td>(*Refer to working note 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Wages and Variable Overhead...(b)</td>
<td>180</td>
<td>210*</td>
<td>206</td>
<td>4 (F)</td>
</tr>
<tr>
<td>(*Refer to working note 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Variable Costs: (B) = (a + b)</td>
<td>480</td>
<td>560</td>
<td>530</td>
<td>30(F)</td>
</tr>
<tr>
<td>Contribution (C) = (A) – (B)</td>
<td>120</td>
<td>140</td>
<td>240</td>
<td>100 (F)</td>
</tr>
<tr>
<td>Less : Fixed Cost</td>
<td>80</td>
<td>80</td>
<td>150</td>
<td>70 (A)</td>
</tr>
<tr>
<td>Profit</td>
<td>40</td>
<td>60</td>
<td>90</td>
<td>30(F)</td>
</tr>
</tbody>
</table>

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4. Data for Material Variances (i)

<table>
<thead>
<tr>
<th>Standard Cost for Actual Output</th>
<th>Actual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity of Material (m/t)</td>
<td>Rate per m/t (₹)</td>
</tr>
<tr>
<td>5,83,333..</td>
<td>60*</td>
</tr>
<tr>
<td>₹350 lacs</td>
<td></td>
</tr>
<tr>
<td>₹60*</td>
<td></td>
</tr>
</tbody>
</table>

* ₹ 300 lacs / 5 lacs m/t

Material Price Variance  = (Standard Rate – Actual Rate) × Actual Quantity
= Nil

Material Usage Variance  = (Standard Quantity – Actual Quantity) × Standard Rate per m/t
= (5,83,333.. – 5,40,000) × ₹ 60
= ₹26 lacs (F)

Data for Labour Variances/ Overhead Variances (ii)

<table>
<thead>
<tr>
<th>Standard Cost for Actual Output</th>
<th>Actual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labour Hours</td>
<td>Rate per hour (₹)</td>
</tr>
<tr>
<td>87,50,000</td>
<td>2.40*</td>
</tr>
<tr>
<td>₹210 lacs</td>
<td></td>
</tr>
</tbody>
</table>

* ₹ 180 lacs / 75 lacs hours

Rate Variance  = (Standard Rate – Actual Rate) × Actual Labour Hours
= (₹ 2.40 – ₹ 2.575) × 80,00,000
= ₹14 lacs (A)

Efficiency Variance  = (Standard Labour Hours – Actual Labour Hours) × Standard Rate per Hour
= (87,50,000 – 80,00,000) × ₹ 2.40
= ₹18 lacs (F)
Problem-26

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

<table>
<thead>
<tr>
<th></th>
<th>Year ended</th>
<th>Year ended</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(<code> In lacs)</code></td>
<td>(<code> In lacs)</code></td>
</tr>
<tr>
<td></td>
<td>31-03-2013</td>
<td>31-3-2014</td>
</tr>
<tr>
<td><strong>Sales</strong></td>
<td>3,000</td>
<td>3,277.50</td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>2,000</td>
<td>2,357.50</td>
</tr>
<tr>
<td><strong>Variable overheads</strong></td>
<td>500</td>
<td>525.00</td>
</tr>
<tr>
<td><strong>Fixed overheads</strong></td>
<td>300</td>
<td>367.50</td>
</tr>
<tr>
<td><strong>Profit</strong></td>
<td>200</td>
<td>27.50</td>
</tr>
</tbody>
</table>

During the year ended 31-3-2014 sale price has increased by 15% whereas material and overhead prices have increased by 15% and 5% respectively.

Required

(i) Analyse the variances of revenue and each element of cost over the year in order to bring out the reasons for the change in profit.

(ii) Present a profit reconciliation statement starting from profits in 2012-13 showing the factors responsible for the change in profits in 2013-14.

Solution


<table>
<thead>
<tr>
<th>Particulars</th>
<th>(` in lacs)</th>
<th>(` in lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Profit</td>
<td></td>
<td>200.00</td>
</tr>
<tr>
<td>Sales Margin Variances:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>427.50 (F)</td>
<td></td>
</tr>
<tr>
<td>Volume</td>
<td>10.00 (A)</td>
<td>417.50 (F)</td>
</tr>
<tr>
<td>Direct Material Variances:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>307.50 (A)</td>
<td></td>
</tr>
<tr>
<td>Usage</td>
<td>150.00 (A)</td>
<td>457.50 (A)</td>
</tr>
<tr>
<td>Variable Overheads Variances:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenditure</td>
<td>25.00 (A)</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>25.00 (A)</td>
<td>50.00 (A)</td>
</tr>
</tbody>
</table>
5.102 Advanced Management Accounting

Fixed Overheads Variances:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditure</td>
<td>67.50 (A)</td>
<td></td>
</tr>
<tr>
<td>Volume</td>
<td>15.00 (A)</td>
<td>82.50 (A)</td>
</tr>
<tr>
<td>Actual Profit</td>
<td></td>
<td>27.50</td>
</tr>
</tbody>
</table>

COMPUTATION OF VARIANCES (₹ In Lacs)

Sales Variances

Price Variance
= Actual Sales – Standard Sales
= ₹3,277.50 – ₹2,850.00
= ₹427.50 (F)

Volume Variance
= Standard Sales – Budgeted Sales
= ₹2,850.00 – ₹3,000.00
= ₹150 (A)

Sales Margin Price Variance
= Sales Price Variance
= ₹427.50 (F)

Sales Margin Volume Variance
= Sales Volume Variance × Budgeted Net Profit Ratio
= ₹150 (A) × \( \frac{200}{3,000} \)
= ₹10 (A)

Material Variances

Material Price Variance
= Standard Cost of Actual Quantity – Actual Cost
= ₹2,050.00 – ₹2,357.50
= ₹307.50 (A)

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

Variable Overhead Variances

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

\[ \text{Efficiency Variances} = \text{Standard Variable Overheads for Production} - \text{Budgeted Variable Overheads for Actual Hours} \]

Or

\[ \text{Efficiency Variances} = \text{Std. Rate per unit} \times \text{Actual Output} - \text{Std. Rate per unit} \times \text{Expected Output for Actual Hours Worked} \]

\[ \begin{align*} & = ₹475 - ₹500 \\ & = ₹25 \text{ (A)} \end{align*} \]

Fixed Overhead Variances

Expenditure Variance

\[ \text{Expenditure Variance} = \text{Budgeted Fixed Overheads} - \text{Actual Fixed Overheads} \]

\[ \begin{align*} & = ₹300.00 - ₹367.50 \\ & = ₹67.50 \text{ (A)} \end{align*} \]

Volume Variance

\[ \text{Volume Variance} = \text{Absorbed Fixed Overheads} - \text{Budgeted Fixed Overheads} \]

\[ \begin{align*} & = ₹285 - ₹300 \\ & = ₹15 \text{ (A)} \end{align*} \]

WORKING NOTES (₹ in lacs)

Note-1

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales in F.Y. 2013-2014</td>
<td>₹3,277.50</td>
</tr>
<tr>
<td>Less: Increase due to price rise [₹3,277.50 lacs × 15/115]</td>
<td>₹427.50</td>
</tr>
<tr>
<td>Sales in F.Y. 2013-2014 at F.Y. 2012-2013 Prices [Standard Sales]</td>
<td>₹2,850.00</td>
</tr>
<tr>
<td>Sales in F.Y. 2012-2013</td>
<td>₹3,000.00</td>
</tr>
<tr>
<td>Fall in Sales in F.Y. 2013-2014 [₹3,000 lacs - ₹2,850 lacs]</td>
<td>₹150.00</td>
</tr>
<tr>
<td>Percentage fall</td>
<td>5%</td>
</tr>
</tbody>
</table>

Note-2

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Cost In F.Y. 2012-2013</td>
<td>₹2,000.00</td>
</tr>
<tr>
<td>Less: 5% for Decrease in Volume</td>
<td>₹100.00</td>
</tr>
<tr>
<td>'Standard Material Usage' at F.Y. 2012-13 Prices (Standard Cost of Standard Quantity for Actual output)</td>
<td>₹1,900.00</td>
</tr>
<tr>
<td>Actual Material Cost F.Y. 2013-2014</td>
<td>₹2,357.50</td>
</tr>
<tr>
<td>Less: 15% Increase in Prices [₹2,357.50 lakhs × 15/115]</td>
<td>₹307.50</td>
</tr>
<tr>
<td>Actual Materials Used, at F.Y. 2012-2013 Prices (Standard Cost of Actual Quantity)</td>
<td>₹2,050.00</td>
</tr>
</tbody>
</table>
Note-3

Variable Overheads Cost in F.Y. 2012-13  
500.00

Less: 5% due to fall in Volume of Sales in F.Y. 2013-14  
25.00

"Standard Overheads for Production" in F.Y. 2013-14  
475.00

Actual Variable Overheads Incurred in F.Y. 2013-14  
525.00

Less: 5% for Increase in Price [₹525 lacs × 5 / 105]  
25.00

Amount Spent in F.Y. 2013-14 at F.Y. 2012-13 Prices  
(Budgeted Variable Overheads for Actual Hours)  
500.00

Note-4

Fixed Overheads Cost in F.Y. 2012-13  
300.00

Less: 5% due to fall in Volume of Sales in F.Y. 2013-14  
15.00

(Absorbed Fixed Overheads)  
285.00

This problem can also be solved by ‘Contribution’ approach.

Problem-27

The summarised results of a company for the two years ended 31st December 2013 and 2012 are given below:-

<table>
<thead>
<tr>
<th>Particulars</th>
<th>2013 (` lakhs)</th>
<th>2012 (` lakhs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>770</td>
<td>600</td>
</tr>
<tr>
<td>Direct Materials</td>
<td>324</td>
<td>300</td>
</tr>
<tr>
<td>Direct Wages</td>
<td>137</td>
<td>120</td>
</tr>
<tr>
<td>Variables Overheads</td>
<td>69</td>
<td>60</td>
</tr>
<tr>
<td>Fixed Overheads</td>
<td>150</td>
<td>80</td>
</tr>
<tr>
<td>Profit</td>
<td>90</td>
<td>40</td>
</tr>
</tbody>
</table>

As a result of re-organisation of production methods and extensive advertisement campaign used, the company was able to secure an increase in the selling price by 10% during the year 2013 as compared to the previous year.
In the year 2012, the company consumed 1,20,000 kgs. of raw materials and used 24,00,000 hours of direct labour. In the year 2013, the corresponding figures were 1,35,000 kgs. of raw materials and 26,00,000 hours of direct labour.

**Required**

Use the information given for the year 2012 as the base year information to analyse the results of the year 2013 and to show in a form suitable to the management the amount each factor has contributed by way of price, usage and volume to the change in profit in 2013.

### Solution

**STATEMENT SHOWING “Causes of Change in Profit in 2013”**

<table>
<thead>
<tr>
<th>Description</th>
<th><code>₹</code> lakhs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profit Earned in 2012</td>
<td>40</td>
</tr>
<tr>
<td>Add: Increase in Profit due to:</td>
<td></td>
</tr>
<tr>
<td>Sales Price Variance</td>
<td>70 (F)</td>
</tr>
<tr>
<td>Sales Margin Volume Variance [₹100 × 20%]</td>
<td>20 (F)</td>
</tr>
<tr>
<td>Add: Savings in Material Cost due to:</td>
<td></td>
</tr>
<tr>
<td>Material Price Variance</td>
<td>13.50 (F)</td>
</tr>
<tr>
<td>Material Usage Variance</td>
<td>12.50 (F)</td>
</tr>
<tr>
<td>Add: Net Savings in Wages</td>
<td></td>
</tr>
<tr>
<td>Labour Rate Variance</td>
<td>7.00 (A)</td>
</tr>
<tr>
<td>Labour Efficiency Variance</td>
<td>10.00 (F)</td>
</tr>
<tr>
<td>Add: Net Savings in Variable Overheads due to:</td>
<td></td>
</tr>
<tr>
<td>Expenditure Variance</td>
<td>4.00 (A)</td>
</tr>
<tr>
<td>Efficiency Variance</td>
<td>5.00 (F)</td>
</tr>
<tr>
<td>Less: Decrease in Profit due to:</td>
<td></td>
</tr>
<tr>
<td>Increase in Fixed Overheads</td>
<td>70</td>
</tr>
<tr>
<td>Profit in 2013</td>
<td>90</td>
</tr>
</tbody>
</table>

### WORKING NOTES

1. **Sales**

   \[ \text{Sales in 2013 Price} \left( \frac{770 \text{ lakhs} \times 100\%}{110\%} \right) = ₹700 \text{ lakhs} \]
Increase in Sales Volume (16.67% or 1/6th over that in 2012) ₹100 lakhs
Or Say Sales Volume Variance
Sales Price Variance (₹770 lakhs – ₹700 lakhs) ₹70 lakhs

(2) Material

Material Price per Kg. in 2012 (₹300 lakhs / 1.20 lakhs kgs.) ₹250
Material Price per Kg. in 2013 (₹324 lakhs / 1.35 lakhs kgs.) ₹240

Saving in Material Price per Kg. ₹10
Increase in expected Material Consumption In 2013 20,000 Kgs.
(1/6 of 1,20,000 Kgs.)
Total expected Consumption in 2013 (1,20,000 Kgs.+ 20,000 Kgs.) 1,40,000 Kgs.
Actual Consumption in 2012 1,35,000 Kgs.
Saving in Materials 5,000 Kgs.
Material Price Variance (1,35,000 × ₹10) ₹13,50,000 (F)
Material Usage variance (5,000Kgs. × ₹250) ₹12,50,000 (F)

(3) Wages

Labour hour rate in 2012 (₹120 lakhs / 24 lakh hrs.) ₹5
Labour hour rate in 2013 (₹137 lakhs / 26 lakh hrs.) ₹5.2692..

Increase in expected Labour due to Volume increase in 2013 4,00,000 hrs.
(1/6 of 24 lakh hrs.)
Total expected Hours required in 2013 28,00,000 hrs.
(24,00,000 hrs.+ 1/6 of 24,00,000 hrs.)
Actual Labour Hours used in 2013 26,00,000 hrs.
Saving in Labour Hours 2,00,000 hrs.
Labour Rate Variance [26,00,000 hrs. × (₹ 5 – ₹ 5.2692...)] ₹7,00,000 (A)
Labour Efficiency Variance (2,00,000 hrs. × ₹5) ₹10,00,000 (F)
(4) Variable Overheads (V.O.)

Variable Overhead hour rate in 2012 \( \frac{\text{₹}60 \text{ lakhs}}{24 \text{ lakh hrs.}} \) \( ₹2.5 \)

Labour hour rate in 2013 \( \frac{\text{₹}69 \text{ lakhs}}{26 \text{ lakh hrs.}} \) \( ₹2.6538.. \)

Increase in expected V.O. due to Volume increase in 2013 \( 4,00,000 \text{ hrs.} \)

(1/6 of 24lakh hrs.)

Total expected Hours required in 2013 \( 28,00,000 \text{ hrs.} \)

(24,00,000 hrs.+ 1/6 of 24,00,000 hrs.)

Actual Variable Overheads Hours used in 2013 \( 26,00,000 \text{ hrs.} \)

Saving in Variable Overheads Hours \( 2,00,000 \text{ hrs.} \)

V.O. Expenditure Variance \[ 26,00,000 \text{ hrs.} \times (₹2.5 – ₹2.6538...) \] \( ₹4,00,000(A) \)

V.O. Efficiency Variance \( 2,00,000 \text{ hrs.} \times ₹2.5 \) \( ₹5,00,000(F) \)

(Assumed Variable Overheads are related to direct labour hours)

(5) Fixed Overheads

Increase in 2013 over 2012 \( (₹150 \text{ lakhs} – ₹80 \text{ lakhs}) \) \( ₹70 \text{ lakhs} \)

(6) P/V Ratio in 2012

\[ \frac{\text{₹}(80 + 40) \text{ lakhs}}{\text{₹}600 \text{ lakhs}} \times 100 \] \( 20\% \)

Computation of Variances and Reconciliation of Budgeted/Standard Profit with Actual Profit

Problem-28

ZCL Ltd. produces one standard product X and operates standard costing and budgetary control system. During the month of February the following information were available:

(i) Direct Materials:

100 tonnes of material A at ₹155 per tonne were issued for production. The standard price of A is ₹150 per tonne and standard production from each tonne of material A consumed is 50 units.

(ii) Direct Labour:

Skilled and semi-skilled workers are employed in the factory. The budgeted labour-mix is as follows:

Skilled......................... 6,000 hours at ₹1.50 per hour.......................... ₹9,000
Semi-Skilled…………………………. 10,000 hours at ₹1.00 per hour…………………………. ₹10,000
At the end of February an analysis of wages showed the following:
Skilled…………………………. 6,600 hours at ₹1.60 per hour…………………………. ₹10,560
Semi-Skilled…………………………. 11,000 hours at ₹0.80 per hour…………………………. ₹8,800

Failure of power, machine breakdown, etc. resulted in 120 idle hours in respect of skilled workers.

(iii) Variable Overhead:
The standard variable overhead rate per unit has been set at ₹2. Actual variable overhead for the month was ₹11,500.

(iv) Fixed Overhead:
Budgeted Overhead……………………………………………………………………………………₹2,18,750 p.a.
Budgeted Production for the year………………………………………………………………………………62,500 units
Budgeted number of weeks in the year……………………………………………………………………50 weeks
Actual production (February)…………………………………………………………………………………6,000 units
Actual overhead (February)……………………………………………………………………………………₹22,000

(v) Sales:

<table>
<thead>
<tr>
<th>Product</th>
<th>Budget</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity</td>
<td>Price (₹)</td>
</tr>
<tr>
<td>X</td>
<td>5,000</td>
<td>20</td>
</tr>
</tbody>
</table>

Required

Calculate the necessary variances and prepare a summary thereof with reconciliation statement.

Solution

BASIC WORKINGS

Standard Output = 5,000 units
(100 tonnes x 50 units)
Actual Output = 6,000 units

COMPUTATION OF VARIANCES

Direct Material Variances

Material Cost Variance = Standard Cost – Actual cost
= 120 tonnes x ₹150 – 100 tonnes x ₹155
Material Price Variance = Actual Quantity × (Standard Price – Actual Price)
= 100 tonnes × (₹150 – ₹155)
= ₹ 500 (A)

Material Usage Variance = Standard Price × (Standard Quantity – Actual Quantity)
= ₹ 150 × (120 tonnes – 100 tonnes)
= ₹ 3,000 (F)

Verification
Material Cost Variance = Material Price Variance + Material Usage Variance
= ₹ 500 (A) + ₹ 3,000 (F)
= ₹ 2,500 (F)

Direct Labour Variances

<table>
<thead>
<tr>
<th>Category</th>
<th>Standard Cost (6,000 units)</th>
<th>Actual (6,000 units)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hrs.</td>
<td>Rate</td>
</tr>
<tr>
<td>Skilled</td>
<td>7,200</td>
<td>1.50</td>
</tr>
<tr>
<td>Semi-Skilled</td>
<td>12,000</td>
<td>1.00</td>
</tr>
<tr>
<td>Total</td>
<td>19,200</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Labour Rate Variance = Actual Hours × (Standard Rate - Actual Rate)
Skilled = 6,600 hours × (₹1.50 – ₹1.60)
= ₹660 (A)

Semi-Skilled = 11,000 hours × (₹1.00 – ₹0.80)
= ₹2,200 (F)

Total = ₹660 (A) + ₹2,200 (F)
= ₹1,540 (F)

Labour Efficiency Variance = Standard Rate × (Standard Hours – Actual Hours)
Skilled = ₹1.50 × (7,200 hours – 6,600 hours)
= 900 (F)

Semi-Skilled = ₹1.00 × (12,000 hours – 11,000 hours)
= 1,000 (A)
Labour Cost Variance
= Labour Rate Variance + Labour Efficiency Variance
= 1,540 (F) + 1,900 (F) = ₹ 3,440 (F)

Verification
Labour Cost Variance
= Standard Cost – Actual Cost
= ₹ 22,800 – ₹19,360 = ₹ 3,440 (F)

Labour Efficiency Variance may be segregated into:
(i) Idle Time Variance
(ii) Net Efficiency Variance

Or
(i) Idle Time Variance
(ii) Mix Variance
(i) Yield Variances

Idle Time Variance
= Standard Rate \text{ per hour} \times \text{Actual Idle hours}
= ₹1.50 \times 120 \text{ hours}
= ₹ 180 (A)

Net Efficiency Variance
= Standard Rate \times (\text{Standard Hours – Actual Hours Worked})
Skilled
= ₹1.50 \times (7,200 \text{ hours – 6,480 hours})
= ₹1,080 (F)

Semi-Skilled
= ₹1.00 \times (12,000 \text{ hours –11,000 hours})
= ₹1,000 (F)

Total
= ₹1,080 (F) + ₹1,000 (F)
= ₹ 2,080 (F)

Verification
Labour Efficiency Variance
= Idle Time Variance + Net Efficiency Variance
= ₹ 180 (A) + ₹ 2,080 (F)
= ₹ 1,900 (F)
Labour Mix Variance

\[
\text{Labour Mix Variance} = \text{Total Actual Time Worked (hours)} \times \{\text{Average Standard Rate per hour of Standard Gang} \times \text{Average Standard Rate per hour of Actual Gang}\}
\]

\[
= 17,480 \text{ hours} \times \left( \frac{22,800}{19,200 \text{ hrs.}} \times 6,480 \text{ hrs.} + \frac{11,000}{17,480 \text{ hrs.}} \times 1.5 \times 6,480 \text{ hrs.} \right)
\]

\[
= Rs. 37.50 \text{ (F)}
\]

Labour Yield Variance

\[
\text{Labour Yield Variance} = \text{Average Standard Rate per hour of Standard Gang} \times \{\text{Total Standard Time (hours)} \times \text{Less} \times \text{Total Actual Time Worked (hours)}\}
\]

\[
= \left( \frac{22,800}{19,200 \text{ hrs.}} \right) \times (19,200 \text{ hrs.} - 17,480 \text{ hrs.})
\]

\[
= Rs. 2,042.50 \text{ (F)}
\]

Verification

Labour Efficiency Variance

\[
\text{Labour Efficiency Variance} = \text{Idle Time Variance} + \text{Mix Variance} + \text{Yield Variance}
\]

\[
= Rs. 180 \text{ (A)} + Rs. 37.50 \text{ (F)} + 2,042.50 \text{ (F)}
\]

\[
= Rs. 1,900 \text{ (F)}
\]

Variable Overhead Variances

Cost Variance

\[
\text{Cost Variance} = \text{Standard Variable Overheads for Output} - \text{Actual Overheads}
\]

\[
= Rs. 12,000 - 11,500
\]

\[
= Rs. 500 \text{ (F)}
\]

Fixed Overhead Variances

Cost Variance

\[
\text{Cost Variance} = \text{Absorbed Fixed Overheads} - \text{Actual Fixed Overheads}
\]

\[
= 6,000 \text{ units} \times Rs. 3.50 - Rs. 22,000
\]

\[
= Rs. 21,000 - Rs. 22,000
\]

\[
= Rs. 1,000 \text{ (A)}
\]

Expenditure Variance

\[
\text{Expenditure Variance} = \text{Budgeted Fixed Overheads} - \text{Actual Fixed Overheads}
\]

\[
= 5,000 \text{ units} \times Rs. 3.50 - Rs. 22,000
\]

\[
= Rs. 17,500 - Rs. 22,000
\]

\[
= Rs. 4,500 \text{ (A)}
\]
Volume Variance

\[ \text{Volume Variance} = \text{Absorbed Fixed Overheads} - \text{Budgeted Fixed Overheads} \]
\[ = ₹21,000 - ₹17,500 \]
\[ = ₹3,500 \text{ (F)} \]

**Verification**

Cost Variance

\[ \text{Cost Variance} = \text{Expenditure Variance} + \text{Volume variance} \]
\[ = 4,500 \text{ (A)} + 3,500 \text{ (F)} \]
\[ = ₹1,000 \text{ (A)} \]

Efficiency Variance

\[ \text{Efficiency Variance} = \text{Absorbed Fixed Overheads} - \text{Budgeted Fixed Overheads for Actual Hours} \]
\[ = ₹21,000 - ₹3.50 \times \frac{5,000\text{units}}{16,000\text{hrs.}} \times 17,480\text{hrs.} \]
\[ = ₹1,881.25 \text{ (F)} \]

Capacity Variance

\[ \text{Capacity Variance} = \text{Budgeted Fixed Overheads for Actual Hours} - \text{Budgeted Fixed Overheads} \]
\[ = ₹3.50 \times \frac{5,000\text{units}}{16,000\text{hrs.}} \times 17,480\text{hrs.} - ₹17,500 \]
\[ = ₹1,618.75 \text{ (F)} \]

**Verification**

Volume Variance

\[ \text{Volume Variance} = \text{Efficiency Variance} + \text{Capacity variance} \]
\[ = ₹1,881.25 \text{ (F)} + ₹1,618.75 \text{ (F)} \]
\[ = ₹3,500 \text{ (F)} \]

Sales Variances

Sales Value Variance

\[ \text{Sales Value Variance} = \text{Actual Sales} - \text{Budgeted Sales} \]
\[ = ₹96,600 - ₹100,000 \]
\[ = ₹3,400 \text{ (A)} \]

Sales Price Variance

\[ \text{Sales Price Variance} = \text{Actual Sales} - \text{Standard Sales} \]
\[ = ₹96,600 - 4,600 \text{ units} \times ₹20 \]
\[ = 4,600 \text{ (F)} \]

Sales Volume Variance

\[ \text{Sales Volume Variance} = \text{Standard Sales} - \text{Budgeted Sales} \]
\[
\text{Standard Costing } 5.113
\]

\[
= \text{\$92,000} - \text{\$1,00,000} = \text{\$8,000 (A)}
\]

**SUMMARY OF VARIANCES**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>(\text{\textcurrency\text{\text{}\text{}}})</th>
<th>(\text{\textcurrency\text{\text{}\text{}}})</th>
<th>(\text{\textcurrency\text{\text{}\text{}}})</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct Material Cost Variance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price Variance</td>
<td></td>
<td>500 (A)</td>
<td></td>
</tr>
<tr>
<td>Usage Variance</td>
<td></td>
<td>3,000 (F) 2,500 (F)</td>
<td></td>
</tr>
<tr>
<td><strong>Direct Labour Cost Variance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate Variance</td>
<td></td>
<td>1,540 (F)</td>
<td></td>
</tr>
<tr>
<td>Net Efficiency Variance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mix Variance</td>
<td></td>
<td>37.50 (F)</td>
<td></td>
</tr>
<tr>
<td>Yield Variance</td>
<td></td>
<td>2,042.50 (F) 2,080 (F)</td>
<td></td>
</tr>
<tr>
<td>Idle Time Variance</td>
<td></td>
<td>180 (A) 3,440 (F)</td>
<td></td>
</tr>
<tr>
<td><strong>Variable Overhead Cost Variance</strong></td>
<td></td>
<td></td>
<td>500 (F)</td>
</tr>
<tr>
<td><strong>Fixed Overhead Cost Variance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenditure Variance</td>
<td></td>
<td>4,500 (A)</td>
<td></td>
</tr>
<tr>
<td><strong>Sales Value Variances</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price Variance</td>
<td></td>
<td>4,600 (F)</td>
<td></td>
</tr>
<tr>
<td>Volume Variance</td>
<td></td>
<td>8,000 (A) 3,400 (A)</td>
<td></td>
</tr>
<tr>
<td><strong>Sales Margin Variances</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price Variance</td>
<td></td>
<td>4,600 (F)</td>
<td></td>
</tr>
<tr>
<td>Volume Variance</td>
<td>[\frac{10,000(A) \times \left(\frac{120 - 12.30}{20}\right)}{20}]</td>
<td>3,080 (A) 1,520 (F)</td>
<td>1,520 (F)</td>
</tr>
</tbody>
</table>

**STANDARD COST per unit**

\[
\text{\textcurrency\text{\text{}\text{}}} 3.00
\]

\[
\text{\textcurrency\text{\text{}\text{}}} 3.80
\]

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### Variable Overheads

<table>
<thead>
<tr>
<th>Overhead Type</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Overheads</td>
<td>3.50</td>
</tr>
<tr>
<td>Standard Cost</td>
<td>12.30</td>
</tr>
</tbody>
</table>

### RECONCILIATION - BUDGETED AND ACTUAL PROFIT

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Profit (5,000 \times (20 - 12.30))</td>
<td>38,500</td>
</tr>
<tr>
<td>Add: Sales Margin Price Variance (F)</td>
<td>4,600</td>
</tr>
<tr>
<td>Less: Sales Margin Volume Variance (A)</td>
<td>3,080</td>
</tr>
<tr>
<td>Add: Total Cost Variance (F) (2,500(F) + 3,440(F) + 500(F) + 1,000(A))</td>
<td>5,440</td>
</tr>
<tr>
<td>Actual Net Profit</td>
<td>45,460</td>
</tr>
</tbody>
</table>

### VERIFICATION

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Sales</td>
<td>96,600</td>
</tr>
<tr>
<td>Less: Actual Cost</td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td>15,500</td>
</tr>
<tr>
<td>Labour</td>
<td>19,360</td>
</tr>
<tr>
<td>Variable Overhead</td>
<td>11,500</td>
</tr>
<tr>
<td>Fixed Overhead</td>
<td>22,000</td>
</tr>
<tr>
<td>Add: Closing Stock of Finished Goods at Standard Cost (1,400 \times 12.30)</td>
<td>17,220</td>
</tr>
<tr>
<td>Actual Net Profit</td>
<td>45,460</td>
</tr>
</tbody>
</table>

### Problem-29

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material, A 10 kg @ ₹ 5 per kg</td>
<td>50.00</td>
</tr>
<tr>
<td>B 5 kg @ ₹ 6 per kg</td>
<td>30.00</td>
</tr>
<tr>
<td>Direct Wages, 5 hours @ ₹ 5 per hour</td>
<td>25.00</td>
</tr>
<tr>
<td>Variable Production Overheads, 5 hours @ 12 per hour</td>
<td>60.00</td>
</tr>
<tr>
<td>Fixed Production Overheads</td>
<td>25.00</td>
</tr>
</tbody>
</table>
A fixed production overhead has been absorbed on the expected annual output of 25,200 units produced evenly throughout the year. During the month of December, 2013, the following were the actual results for an actual production of 2,000 units:

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity/Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>2,000 units @ ₹ 225</td>
<td>4,50,000</td>
</tr>
<tr>
<td>Direct Materials, A</td>
<td>18,900 kg</td>
<td>99,225</td>
</tr>
<tr>
<td></td>
<td>10,750 kg</td>
<td>61,275</td>
</tr>
<tr>
<td>Direct Wages</td>
<td>10,500 hours (actually worked 10,300 hours)</td>
<td>50,400</td>
</tr>
<tr>
<td>Variable Production Overheads</td>
<td></td>
<td>1,15,000</td>
</tr>
<tr>
<td>Fixed Production Overheads</td>
<td></td>
<td>56,600</td>
</tr>
<tr>
<td>Gross Profit</td>
<td></td>
<td>67,500</td>
</tr>
</tbody>
</table>

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

Required
(i) Calculate all Variances.
(ii) Prepare a reconciliation statement showing Standard Gross Profit, Variances and Actual Gross Profit.
(iii) Explain the reason for the difference in Actual Gross Profit given in the Problem and calculated in (ii) above.

Solution

**COMPUTATION OF VARIANCES**

**Direct Material Variances**

Material Price Variance  = Standard Cost of Actual Quantity – Actual Cost
                      = $PQ \times SP - PQ \times AP$


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Or

\[ PQ \times (SP - AP) \]

(A) = \( 20,000 \text{ Kg.} \times (\text{₹ 5.00} - \text{₹ 5.25}) \)

= ₹ 5,000 (A)

(B) = \( 11,500 \text{ Kg.} \times (\text{₹ 6.00} - \text{₹ 5.70}) \)

= ₹ 3,450 (F)

Total = ₹ 5,000 (A) + ₹ 3,450 (F)

= ₹ 1,550 (A)

**Material Usage Variance** = Standard Cost of Standard Quantity for Actual Output – Standard Cost of Actual Quantity

[\( SQ \times SP - AQ \times SP \)]

Or

[\( SP \times (SQ - AQ) \)]

(A) = \( 5 \times (2,000 \text{ units} \times 10 \text{ Kg.} - 18,900 \text{ Kg.}) \)

= ₹ 5,500 (F)

(B) = \( 6 \times (2,000 \text{ units} \times 5 \text{ Kg.} - 10,750 \text{ Kg.}) \)

= ₹ 4,500 (A)

Total = ₹ 5,500 (F) + ₹ 4,500 (A)

= ₹ 1,000 (F)

**Material Mix Variance** = Total Actual Quantity (units) \( \times \) (Average Standard Price per unit of Standard Mix – Average Standard Price per unit of Actual Mix)

\[
\begin{align*}
\text{Total Actual Quantity (units)} & \times \left( \frac{\text{₹ 50} + \text{₹ 30}}{2,000 \text{ units}} \times 2,000 \text{ units} \times (10 \text{ Kg.} + 5 \text{ Kg.}) \right) \\
& - \left( \frac{\text{₹ 5} \times 18,900 \text{ Kg.} + \text{₹ 6} \times 10,750 \text{ Kg.}}{2,000 \text{ units} \times (10 \text{ Kg.} + 5 \text{ Kg.})} \right) \\
& = \text{₹ 866.66... (A)}
\end{align*}
\]

**Material Yield Variance** = Average Standard Price per unit of Standard Mix \( \times \) [Total Standard Quantity (units) – Total Actual Quantity (units)]

\[
\begin{align*}
\left( \frac{(\text{₹ 50} + \text{₹ 30}) \times 2,000 \text{ units}}{2,000 \text{ units} \times (10 \text{ Kg.} + 5 \text{ Kg.})} \right) \times \\
\end{align*}
\]
[(10Kg. + 5Kg.) × 2,000 units – (18,900 Kg. + 10,750 Kg.)]

= ₹ 1,866.66… (F)

**Direct Labour Variances**

**Labour Rate Variance**

= Standard Cost of Actual Time – Actual Cost

= \( SR \times AH^* – AR \times AH^* \)

\( Or \)

= \( (SR – AR) \times AH^* \)

= \( \left( \frac{₹50,400}{10,500 \text{hours}} \right) \times 10,500 \text{hours} \)

= ₹2,100 (F)

\( AH^* \) refers to Actual Hours Paid

**Labour Efficiency Variance**

= Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time

= \( (SH \times SR) – (AH^\# \times SR) \)

\( Or \)

= \( (SH – AH^\#) \times SR \)

= ₹5.00 \times (2,000 \text{ units} \times 5 \text{ hours} – 10,300 \text{ hours})

= ₹ 1,500 (A)

**Idle Time Variance**

= Standard Rate per Hour x Actual Idle Hours

= \( (AH^\# \times SR) – (AH^\# \times SR) \)

\( Or \)

= \( (AH^\# – AH^\#) \times SR \)

= ₹5.00 \times (10,500 \text{ hours} – 10,300 \text{ hours})

= ₹ 1,000 (A)

\( AH^\# \) refers to Actual Hours Worked

**Variable Overhead Variances**

**Cost Variance**

= Standard Variable Overheads for Production – Actual Variable Overheads

= 2,000 units \times ₹ 60 – ₹ 1,15,000

= ₹ 5,000 (F)
### Expenditure Variance

\[
\text{Expenditure Variance} = \text{Budgeted Variable Overheads for Actual Hours} - \text{Actual Variable Overheads} \\
= 10,300 \text{ hours} \times 12 - 1,15,000 \\
= ₹ 8,600 \text{ (F)}
\]

### Efficiency Variances

\[
\text{Efficiency Variances} = \text{Standard Variable Overheads for Production} - \text{Budgeted Variable Overheads for Actual Hours} \\
= 2,000 \text{ units} \times 60 - 10,300 \text{ hours} \times 12 \\
= ₹ 3,600 \text{ (A)}
\]

### Fixed Overhead Variances

#### Cost Variance

\[
\text{Cost Variance} = \text{Absorbed Fixed Overheads} - \text{Actual Fixed Overheads} \\
= 2,000 \text{ units} \times 25.00 - 56,600 \\
= ₹ 50,000 - ₹ 56,600 \\
= ₹ 6,600 \text{ (A)}
\]

#### Expenditure Variance

\[
\text{Expenditure Variance} = \text{Budgeted Fixed Overheads} - \text{Actual Fixed Overheads}. \\
= 2,100 \text{ units} \times 25.00 - 56,600 \\
= ₹ 52,500 - ₹ 56,600 \\
= ₹ 4,100 \text{ (A)}
\]

#### Volume Variance

\[
\text{Volume Variance} = \text{Absorbed Fixed Overheads} - \text{Budgeted Fixed Overheads} \\
= ₹ 50,000 - ₹ 52,500 \\
= ₹ 2,500 \text{ (A)}
\]

### RECONCILIATION STATEMENT

<table>
<thead>
<tr>
<th>Particulars</th>
<th>(₹)</th>
<th>(₹)</th>
<th>(₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Profit (₹35 x 2,000 units)</td>
<td></td>
<td></td>
<td>70,000</td>
</tr>
<tr>
<td><strong>Variances</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price (at the time of receipt)</td>
<td>-----</td>
<td>1,550</td>
<td></td>
</tr>
<tr>
<td>Mix</td>
<td>-----</td>
<td>866.66...</td>
<td></td>
</tr>
<tr>
<td>Yield</td>
<td>1,866.66...</td>
<td>-----</td>
<td>(550)</td>
</tr>
<tr>
<td>Labour:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate</td>
<td>2,100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Reason for the Difference in Actual Gross Profit

Actual Gross Profit given in the problem is ₹ 67,500 while calculated Gross Profit in statement is ₹ 67,450. The difference amount is due to Material Price Variance that is calculated at the time of receipt of material instead of consumption of material.

\[
\text{Material Price Variance} = \text{Standard Cost of Actual Quantity} - \text{Actual Cost} = AQ \times SP - AQ \times AP
\]

\[
\text{Or}
\]

\[
(A) = 18,900 \text{ Kg.} \times (₹ 5.00 - ₹ 5.25) = ₹4,725 (A)
\]

\[
(B) = 10,750 \text{ Kg.} \times (₹ 6.00 - ₹ 5.70) = ₹3,225 (F)
\]

\[
\text{Total} = ₹4,725 (A) + ₹3,225 (F) = ₹1,500 (A)
\]

Over Recovery in the reconciliation statement is ₹50 (₹1,550 − ₹1,500), should be added in Gross Profit ₹67,500 (₹67,450 + ₹50).

Problem-30

You are appointed Accountant of Exe Ltd. Given below is the Company’s Operating Report for March, 2013.
### Particulars

<table>
<thead>
<tr>
<th>Standard and Variances (₹)</th>
<th>Actual (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sales Budgeted</strong></td>
<td>18,000</td>
</tr>
<tr>
<td>Variance due to</td>
<td></td>
</tr>
<tr>
<td>Volume of Orders</td>
<td>1,000</td>
</tr>
<tr>
<td>Selling Price</td>
<td>400</td>
</tr>
<tr>
<td><strong>Profit- Budgeted</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Sales Variances</strong></td>
<td></td>
</tr>
<tr>
<td>Volume</td>
<td>240</td>
</tr>
<tr>
<td>Price</td>
<td>400</td>
</tr>
<tr>
<td><strong>Labour Variances</strong></td>
<td></td>
</tr>
<tr>
<td>Rate</td>
<td>(250)</td>
</tr>
<tr>
<td>Efficiency</td>
<td>(100)</td>
</tr>
<tr>
<td><strong>Material Variances</strong></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>150</td>
</tr>
<tr>
<td>Usage</td>
<td>(60)</td>
</tr>
<tr>
<td><strong>Overhead Variances</strong></td>
<td></td>
</tr>
<tr>
<td>Expenditure-Fixed</td>
<td>100</td>
</tr>
<tr>
<td>-Variable</td>
<td>(250)</td>
</tr>
<tr>
<td>Efficiency</td>
<td>200</td>
</tr>
<tr>
<td>Capacity</td>
<td>100</td>
</tr>
<tr>
<td><strong>Operating Profit</strong></td>
<td></td>
</tr>
</tbody>
</table>

Your assistant provides the following information about sales and costs for April, 2013:

<table>
<thead>
<tr>
<th>Sales</th>
<th>Budgeted Units</th>
<th>Sales Value (₹)</th>
<th>Actual Units</th>
<th>Sales Value (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product A</td>
<td>250</td>
<td>10,000</td>
<td>280</td>
<td>10,800</td>
</tr>
<tr>
<td>Product B</td>
<td>200</td>
<td>6,000</td>
<td>190</td>
<td>5,500</td>
</tr>
<tr>
<td>Product C</td>
<td>150</td>
<td>3,000</td>
<td>180</td>
<td>3,500</td>
</tr>
<tr>
<td>Product</td>
<td>Standard Selling Price per unit</td>
<td>Standard Product Cost per unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------</td>
<td>-------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>40</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>30</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>20</td>
<td>15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Labour:**

- **Standard Labour Cost (per hour)**: ₹ 0.90
- **Budgeted Hours**: 4,000
- **Standard Hours (produced)**: 4,500
- **Actual Clocked Hours**: 4,400
- **Actual Labour Cost**: ₹ 4,260

**Materials:**

- **Standard Cost of Material (actually used)**: ₹ 5,230
- **Standard Cost of Material (allowed)**: ₹ 5,330
- **Actual Cost of Material (used)**: ₹ 5,430

**Overheads:**

- **Budget Rate of Overhead Recovery (per labour hour)**
  - Fixed: ₹ 0.50
  - Variable: ₹ 1.00
- **Actual Overhead Costs**
  - Fixed: ₹ 2,000
  - Variable: ₹ 4,300

**Required**

Prepare the Operating Statement for April, 2013 in the same form as for March, 2013.
### Solution

**OPERATING STATEMENT FOR APRIL, 2013**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Standard and Variances (₹)</th>
<th>Actual (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Budgeted</td>
<td>19,000</td>
<td></td>
</tr>
<tr>
<td>Variance due to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume of Orders</td>
<td>1,500</td>
<td></td>
</tr>
<tr>
<td>Selling Price</td>
<td>(700)</td>
<td>19,800</td>
</tr>
<tr>
<td>Profit- Budgeted’</td>
<td></td>
<td>4,000</td>
</tr>
<tr>
<td>Sales Variances-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume</td>
<td>370</td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>(700)</td>
<td>(330)</td>
</tr>
<tr>
<td>Labour Variances-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate</td>
<td>(300)</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>90</td>
<td>(210)</td>
</tr>
<tr>
<td>Material Variances-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>(200)</td>
<td></td>
</tr>
<tr>
<td>Usage</td>
<td>100</td>
<td>(100)</td>
</tr>
<tr>
<td>Overhead Variances-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenditure - Variable</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Efficiency - Fixed</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>- Variable</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Capacity</td>
<td>200</td>
<td>450</td>
</tr>
<tr>
<td>Operating Profit</td>
<td></td>
<td>3,810</td>
</tr>
</tbody>
</table>

(*) Budgeted Profit \([(₹40 - ₹31) \times 250 \text{ units} + (₹30-₹25) \times 200 \text{ units} + (₹20 - ₹15) \times 150 \text{ units}]\)

**WORKING NOTES**

1. **Sales Variances**
   
   Value Variance  =  Actual Sales – Budgeted Sales
   
   =  ₹ 19,800 – ₹ 19,000
Price Variance = Actual Sales – Standard Sales

Or

= Actual Quantity × (Actual Price – Budgeted Price)

A = ₹ 10,800 – 280 units × ₹ 40
   = 400 (A)

B = ₹ 5,500 – 190 units × ₹ 30
   = 200 (A)

C = ₹ 3,500 – 180 units × ₹ 20
   = 100 (A)

Total = 400 (A) + 200 (A) + 100 (A)
       = 700 (A)

Volume Variance = Standard Sales – Budgeted Sales

Or

= Budgeted Price × (Actual Quantity – Budgeted Quantity)

A = 280 units × ₹ 40 – ₹ 10,000
   = 1,200 (F)

B = 190 units × ₹ 30 – ₹ 6,000
   = 300 (A)

C = 180 units × ₹ 20 – ₹ 3,000
   = 600 (F)

Total = 1,200 (F) + 300 (A) + 600 (F)
       = 1,500 (F)

Margin Volume Variance = Standard Margin – Budgeted Margin

Or

= Budgeted Margin × (Actual Quantity – Budgeted Quantity)

A = ₹9 × (280 units – 250 units)
   = 270 (F)

B = ₹5 × (190 units – 200 units)
   = 50 (A)
5.124 Advanced Management Accounting

\[ C = 5 \times (180 \text{ units} - 150 \text{ units}) = 150 \text{ (F)} \]

Total \[ = 270 \text{ (F)} + 50 \text{ (A)} + 150 \text{ (F)} = 370 \text{ (F)} \]

2. Labour Variances

Cost Variance \[ = \text{Standard Cost} - \text{Actual Cost} = 0.90 \times 4,500 \text{ hours} - 4,260 = 4,050 - 4,260 = 210 \text{ (A)} \]

*Standard Cost refers to ‘Standard Cost of Standard Time for Actual Output’*

Rate Variance \[ = \text{Standard Cost of Actual Time} - \text{Actual Cost} = 4,400 \text{ hours} \times 0.90 - 4,260 = 3,960 - 4,260 = 300 \text{ (A)} \]

Efficiency Variance \[ = \text{Standard Cost of Standard Time for Actual Production} - \text{Standard Cost of Actual Time} = 0.90 \times 4,500 \text{ hours} - 4,400 \text{ hours} \times 0.90 = 90 \text{ (F)} \]

3. Material Variances

Cost Variance \[ = \text{Standard Cost} - \text{Actual Cost} = 5,330 - 5,430 = 100 \text{ (A)} \]

*Standard Cost refers to ‘Standard Cost of Standard Quantity of Actual Output’*

Price Variance \[ = \text{Standard Cost of Actual Quantity} - \text{Actual Cost} = 5,230 - 5,430 = 200 \text{ (A)} \]

Usage Variance \[ = \text{Standard Cost of Standard Quantity for Actual Production} - \text{Standard Cost of Actual Quantity} = 5,330 - 5,230 = 100 \text{ (F)} \]
4. **Variable Overhead Cost Variances**

<table>
<thead>
<tr>
<th>Type</th>
<th>Formula</th>
<th>Calculation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Variance</td>
<td>Standard Variable Overheads for Production – Actual Variable Overheads</td>
<td>₹1 × 4,500 hours – ₹4,300</td>
<td>₹200</td>
</tr>
<tr>
<td>Expenditure Variance</td>
<td>Budgeted Overheads for Actual Hours – Actual Overheads</td>
<td>4,400 hours × ₹1 – ₹4,300</td>
<td>₹100</td>
</tr>
<tr>
<td>Efficiency Variance</td>
<td>Standard Variable Overheads for Production – Budgeted Overheads for Actual Hours</td>
<td>₹4,500 – ₹4,400</td>
<td>₹100</td>
</tr>
</tbody>
</table>

5. **Fixed Overhead Variances**

<table>
<thead>
<tr>
<th>Type</th>
<th>Formula</th>
<th>Calculation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Variance</td>
<td>Absorbed Fixed Overheads – Actual Fixed Overheads</td>
<td>4,500 hours × ₹0.50 – ₹2,000</td>
<td>₹250</td>
</tr>
<tr>
<td>Expenditure Variance</td>
<td>Budgeted Fixed Overheads – Actual Fixed Overheads</td>
<td>4,000 hours × ₹0.50 – ₹2,000</td>
<td>Nil</td>
</tr>
<tr>
<td>Volume Variance</td>
<td>Absorbed Fixed Overheads – Budgeted Fixed Overheads</td>
<td>₹2,250 – ₹2,000 = ₹250 (F)</td>
<td></td>
</tr>
<tr>
<td>Capacity Variance</td>
<td>Budgeted Fixed Overheads for Actual Hours – Budgeted Fixed Overheads</td>
<td>4,400 hours × ₹0.50 – 4,000 hours × ₹0.50</td>
<td>₹200 (F)</td>
</tr>
<tr>
<td>Efficiency Variance</td>
<td>Absorbed Fixed Overheads – Budgeted Fixed Overheads for Actual Hours</td>
<td>₹4,500 hours × ₹0.50 – 4,400 hours × ₹0.50</td>
<td>₹50 (F)</td>
</tr>
</tbody>
</table>
Problem-31

Standard Cost Card of a product is as under:

<table>
<thead>
<tr>
<th></th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Materials</td>
<td></td>
</tr>
<tr>
<td>A 2 Kg. @ ₹ 3 per Kg.</td>
<td>6.00</td>
</tr>
<tr>
<td>B 1 Kg. @ ₹ 4 per Kg.</td>
<td>4.00</td>
</tr>
<tr>
<td>Direct Wages 5 hours @ ₹ 4 per hour</td>
<td>20.00</td>
</tr>
<tr>
<td>Variable Overheads 5 hours @ ₹ 1 per hour</td>
<td>5.00</td>
</tr>
<tr>
<td>Fixed Overheads 5 hours @ ₹ 2 per hour</td>
<td>10.00</td>
</tr>
<tr>
<td>Standard Cost</td>
<td>45.00</td>
</tr>
<tr>
<td>Standard Profit</td>
<td>5.00</td>
</tr>
<tr>
<td>Standard Selling Price</td>
<td>50.00</td>
</tr>
</tbody>
</table>

Budgeted Output is 8,000 units per month.

In October 2013, the company produced and sold 6,000 units. The actual sales value was ₹3,05,000. Direct materials consumed was: Material A: 14,850 kg, valued at ₹43,065 and Material B 7,260 kg, valued at ₹29,750. The total direct labour hours worked was 32,000 and the wages paid therefore amounted to ₹1,27,500. The direct labour hours actually booked on production was 31,800. Overheads recorded were: Fixed ₹80,600 and Variable ₹30,000. Closing work-in-progress was 600 units in respect of which materials A and B were fully issued and labour and overheads were 50% complete.

OPERATING STATEMENT

Budgeted Profit
Sales Variances
Price
Volume
Direct Material Variances
Price (Material A)
Price (Material B)
Yield
Mix
Direct Wages Variances
Required

Analyse the variance and present an operating statement showing the reconciliation between budgeted and actual profits for the month in the above format.

Solution

BASIC CALCULATIONS

Equivalent Production in Units

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Direct Materials</th>
<th>Labour &amp; Overhead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units Completed</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Work-in-Progress</td>
<td>100%</td>
<td>50%</td>
</tr>
<tr>
<td>Total Equivalent Units</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard and Actual Cost of Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
</tbody>
</table>

*Actual Cost/Actual Quantity
COMPUTATION OF VARIANCES

Direct Material Variances

Material Cost Variance = Standard Cost – Actual Cost
= SQ × SP – AQ × AP

(A) = ₹ 39,600 – ₹ 43,065
= ₹ 3,465 (A)

(B) = ₹ 26,400 – ₹ 29,750
= ₹ 3,350 (A)

Total = ₹ 3,465 (A) + ₹ 3,350 (A)
= ₹ 6,815 (A)

Material Price Variance = Standard Cost of Actual Quantity – Actual Cost
= AQ × SP – AQ × AP
Or
= AQ × (SP – AP)

(A) = 14,850 Kg. × (₹ 3.00 – ₹ 2.90)
= ₹ 1,485 (F)

(B) = 7,260 Kg. × (₹ 4.00 – ₹ 4.09.....)
= ₹ 710 (A)

Total = ₹ 1,485 (F) + ₹ 710 (A)
= ₹ 775 (F)

Material Usage Variance = Standard Cost of Standard Quantity for Actual Output – Standard Cost of Actual Quantity
= SQ × SP – AQ × SP
Or
= SP × (SQ – AQ)

(A) = ₹ 3 × (13,200 Kg. – 14,850 Kg.)
= ₹ 4,950 (A)

(B) = ₹ 4 × (6,600 Kg. – 7,260 Kg.)
= ₹ 2,640 (A)
Total = ₹ 2,640 (A) + ₹ 4,950 (A)
= ₹ 7,590 (A)

Material Mix Variance = Total Actual Quantity (units) × \((\text{Average Standard Price per unit of Standard Mix} - \text{Average Standard Price per unit of Actual Mix})\)
= 22,110 Kg. × \(\frac{₹ 66,000 \text{ per unit}}{19,800 \text{ Kg.}} - \frac{₹ 73,590 \text{ per unit}}{22,110 \text{ Kg.}}\)
= ₹ 110 (F)

Material Yield Variance = \(\text{Average Standard Price per unit of Standard Mix} \times [\text{Total Standard Quantity (units)} - \text{Total Actual Quantity (units)}]\)
= \(\frac{₹ 66,000}{19,800 \text{ Kg.}} \times (19,800 \text{ Kg.} - 22,110 \text{ Kg.})\)
= ₹ 7,700 (A)

Direct Labour Variances
Labour Cost Variance = Standard Cost – Actual Cost
= \(S\times SR - AH^* \times AR\)
= \((6,300 \text{ units} \times 5 \text{ hours}) \times ₹ 4 - ₹ 1,27,500\)
= ₹ 1,500 (A)

Labour Rate Variance = Standard Cost of Actual Time – Actual Cost
= \(SR \times AH^* - AR \times AH^*\)
Or
= \((SR - AR) \times AH^*\)
= \(\left(₹ 4 - \frac{₹ 1,27,500}{32,000 \text{ hours}}\right) \times 32,000 \text{ hours}\)
= ₹ 500 (F)

Labour Efficiency Variance = Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time
= \((S\times SR) - (AH^# \times SR)\)
Or
= \((S \times SR) - (AH^#) \times SR\)

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Idle Time Variance

\[ = \text{Standard Rate per Hour} \times \text{Actual Idle Hours} \]

\[ = (\text{AH}_1 \times \text{SR}) - (\text{AH}_2 \times \text{SR}) \]

Or

\[ = (\text{AH}_1 - \text{AH}_2) \times \text{SR} \]

\[ = \text{₹} 4.00 \times (32,000 \text{ hours} - 31,800 \text{ hours}) \]

\[ = \text{₹} 800 \text{ (A)} \]

\( \text{AH}_2 \text{ refers to Actual Hours Worked} \)

Variable Overhead Variances

Cost Variance

\[ = \text{Standard Variable Overheads for Production} - \text{Actual Variable Overheads} \]

\[ = 6,300 \text{ units} \times \text{₹} 5 - \text{₹} 30,000 \]

\[ = \text{₹} 1,500 \text{ (F)} \]

Expenditure Variance

\[ = \text{Budgeted Variable Overheads for Actual Hours} - \text{Actual Variable Overheads} \]

\[ = 31,800 \text{ hours} \times \text{₹} 1 - \text{₹} 30,000 \]

\[ = \text{₹} 1,800 \text{ (F)} \]

Efficiency Variances

\[ = \text{Standard Variable Overheads for Production} - \text{Budgeted Variable Overheads for Actual Hours} \]

\[ = 6,300 \text{ units} \times \text{₹} 5 - 31,800 \text{ hours} \times \text{₹} 1 \]

\[ = \text{₹} 300 \text{ (A)} \]

Fixed Overhead Variances

Cost Variance

\[ = \text{Absorbed Fixed Overheads} - \text{Actual Fixed Overheads} \]

\[ = 6,300 \text{ units} \times \text{₹} 10.00 - \text{₹} 80,600 \]

\[ = \text{₹} 63,000 - \text{₹} 80,600 \]

\[ = \text{₹} 17,600 \text{ (A)} \]

Expenditure Variance

\[ = \text{Budgeted Fixed Overheads} - \text{Actual Fixed Overheads} \]

\[ = 8,000 \text{ units} \times \text{₹} 10.00 - \text{₹} 80,600 \]

\[ = \text{₹} 80,000 - \text{₹} 80,600 \]

\[ = \text{₹} 600 \text{ (A)} \]
Volume Variance = Absorbed Fixed Overheads – Budgeted Fixed Overheads
= ₹63,000 – ₹80,000
= ₹17,000 (A)

Efficiency Variance = Absorbed Fixed Overheads – Budgeted Fixed Overheads for Actual Hours
= ₹63,000 – ₹2.00 × 31,800 hours
= ₹600 (A)

Capacity Variance = Budgeted Fixed Overheads for Actual Hours – Budgeted Fixed Overheads
= ₹2.00 × 31,800 hours – ₹80,000
= ₹16,400 (A)

Sales Variances

Value Variance = Actual Sales – Budgeted Sales
= AP × AQ – BP × BQ
= ₹3,05,000 – ₹50 × 8,000 units
= ₹95,000 (A)

Price Variance = Actual Sales – Standard Sales
= AP × AQ – BP × AQ

Or
= AQ × (AP – BP)
= ₹3,05,000 – 6,000 units × ₹50
= ₹5,000 (F)

Volume Variance = Standard Sales – Budgeted Sales
= BP × AQ – BP × BQ

Or
= BP × (AQ – BQ)
= ₹50 × (6,000 units – 8,000 units)
= ₹1,00,000 (A)
Sales Margin Variances

Sales Margin Price Variance = Sales Price Variance

= 5,000 (F)

Sales Volume Variance = Sales Volume Variance × Budgeted Net Profit Ratio

= 1,00,000 (A) × \( \frac{5}{50} \times 100 \)

= ₹ 10,000 (A)

Margin Variance = Sales Margin Price Variance + Sales Margin Volume Variance

= ₹5,000 (F) + ₹10,000 (A)

= ₹15,000 (A)

Sales Price Variance is equal to Sales Margin Price Variance. This is because, for the actual quantity sold, standard cost remaining constant, change in selling price will have equal impact or turnover and profit.

Sales Margin Volume Variance is equal to Sales Volume Variance × Budgeted Net Profit Ratio

OPERATING STATEMENT

Reconciliation between Budgeted and Actual Profit for the Month

<table>
<thead>
<tr>
<th>Particulars</th>
<th>(₹)</th>
<th>(₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Profit (8,000 units x ₹ 5)</td>
<td></td>
<td>40,000</td>
</tr>
<tr>
<td>Sales Variance:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>5,000 (F)</td>
<td></td>
</tr>
<tr>
<td>Volume</td>
<td>10,000 (A)</td>
<td>5,000 (A)</td>
</tr>
<tr>
<td>Direct Material Variance:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>775 (F)</td>
<td></td>
</tr>
<tr>
<td>Yield</td>
<td>7,700 (A)</td>
<td></td>
</tr>
<tr>
<td>Mix</td>
<td>110 (F)</td>
<td>6,815 (A)</td>
</tr>
<tr>
<td>Direct Wages Variance:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate</td>
<td>500 (F)</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>1,200 (A)</td>
<td></td>
</tr>
</tbody>
</table>
Idle time 800 (A) 1,500 (A)

Variable Overheads Variance:
- Expense 1,800 (F)
- Efficiency 300 (A) 1,500 (F)

Fixed Overheads Variance:
- Expense 600 (A)
- Efficiency 600 (A)
- Capacity 16,400 (A) 17,600 (A)

Actual Profit 10,585

VERIFICATION

<table>
<thead>
<tr>
<th>₹</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Sales</td>
<td>3,05,000</td>
</tr>
<tr>
<td>Less: Actual Cost</td>
<td></td>
</tr>
<tr>
<td>Materials (₹43,065+₹29,750)</td>
<td>72,815</td>
</tr>
<tr>
<td>Labour</td>
<td>1,27,500</td>
</tr>
<tr>
<td>Variable Overhead</td>
<td>30,000</td>
</tr>
<tr>
<td>Fixed Overhead</td>
<td>80,600</td>
</tr>
<tr>
<td>Add: Closing Stock of WIP at Standard Cost</td>
<td>16,500</td>
</tr>
<tr>
<td>Actual Net Profit</td>
<td>10,585</td>
</tr>
</tbody>
</table>

VALUATION OF CLOSING STOCK (at Standard Cost)

<table>
<thead>
<tr>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material A 600 units @ ₹ 6.00 3,600</td>
</tr>
<tr>
<td>Material B 600 units @ ₹ 4.00 2,400</td>
</tr>
<tr>
<td>Labour 300 units @ ₹ 20.00 6,000</td>
</tr>
<tr>
<td>Fixed Overheads 300 units @ ₹ 10.00 3,000</td>
</tr>
<tr>
<td>Variable Overheads 300 units @ ₹ 5.00 1,500</td>
</tr>
<tr>
<td>16,500</td>
</tr>
</tbody>
</table>

Problem-32

Fo -Tan Ltd. operating on a standard costing system, for a given four week period budgeted for sales of 10,000 units at ₹ 50 per unit, actual sales were 9,000 units at ₹ 51.25 per unit. Costs relating to that period were as follows:
### 5.134 Advanced Management Accounting

<table>
<thead>
<tr>
<th></th>
<th>Standard (₹)</th>
<th>Actual (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>2,50,000</td>
<td>2,57,400</td>
</tr>
<tr>
<td>Wages</td>
<td>75,000</td>
<td>70,875</td>
</tr>
<tr>
<td>Fixed Overhead</td>
<td>20,000</td>
<td>18,810</td>
</tr>
<tr>
<td>Variable Overhead</td>
<td>10,000</td>
<td>9,250</td>
</tr>
<tr>
<td>Semi-Variable Overhead</td>
<td>2,700</td>
<td>2,430</td>
</tr>
<tr>
<td>Hours</td>
<td>50,000</td>
<td>40,500</td>
</tr>
</tbody>
</table>

(i) The standard material content of each unit is estimated at 25 Kg. at ₹1 per Kg. actual figures was 26 Kg. at ₹1.10 per Kg.

(ii) The standard wages per unit are 5 hours at ₹1.50 per unit, actual wages were 4.5 hours at ₹1.75.

(iii) Semi-variable overhead consists of five-ninths fixed expenses and four-ninths variable.

(iv) There were no opening stocks and the whole production for the period was sold.

(v) The four week period was a normal period.

**Required**

(a) Compute the variance in sales, materials, labour and overhead due to all possible causes, and

(b) With the help of such a computation draw-
   - a statement reconciling the actual profit for the period with the standard profit.
   - a statement reconciling the actual profit for the period with the budgeted profit.

**Solution**

#### COMPUTATION OF VARIANCES

1. **Sales Variances**
   - **Sales Value Variance**
     \[
     \text{Sales Value Variance} = \text{Actual Sales} - \text{Budgeted Sales} \\
     = ₹51.25 \times 9,000 \text{ units} - ₹50 \times 10,000 \text{ units} \\
     = ₹38,750 \text{ (A)}
     \]
   - **Sales Price Variance**
     \[
     \text{Sales Price Variance} = \text{Actual Sales} - \text{Standard Sales} \\
     \text{Or} \\
     = \text{Actual Quantity} \times (\text{Actual Price} - \text{Budgeted Price}) \\
     = 9,000 \text{ units} \times (₹51.25 - ₹50)
     \]
Standard Costing 5.135

Sales Volume Variance = Standard Sales – Budgeted Sales

\[ = \text{Budgeted Price} \times (\text{Actual Quantity} – \text{Budgeted Quantity}) \]
\[ = \text{Budgeted Price} \times (9,000 \text{ units} – 10,000 \text{ units}) \]
\[ = 50 \times (9,000 \text{ units} – 10,000 \text{ units}) \]
\[ = 50,000 \text{ (A)} \]

Sales Margin Price Variance = Sales Price Variance

\[ = \text{Budgeted Price} \times (\text{Actual Quantity} – \text{Budgeted Quantity}) \times \text{Budgeted Net Profit Ratio} \]
\[ = 50 \times (9,000 \text{ units} – 10,000 \text{ units}) \times \left( \frac{14.23}{50.00} \times 100 \% \right) \]
\[ = 14,230 \text{ (A)} \]

Sales Margin Volume Variance = Sales Volume Variance × Budgeted Net Profit Ratio

\[ = 50,000 \text{ (A)} \times \left( \frac{14.23}{50.00} \times 100 \% \right) \]
\[ = 14,230 \text{ (A)} \]

Sales Margin Variance = Sales Margin Price Variance + Sales Margin Volume Variance

\[ = 11,250 \text{ (F)} + 14,230 \text{ (A)} \]
\[ = 2,980 \text{ (A)} \]

Sales Price Variance is equal to Sales Margin Price Variance. This is because, for the actual quantity sold, standard cost remaining constant, change in selling price will have equal impact or turnover and profit.

Sales Margin Volume Variance is equal to Sales Volume Variance × Budgeted Net Profit Ratio

2. Material Variances

Cost Variance = Standard Cost* – Actual Cost

\[ = \text{Standard Cost of Standard Quantity of Actual Output} – \text{Actual Cost} \]
\[ = 1 \times 25 \text{ Kg.} \times 9,000 \text{ units} – 2,57,400 \]
\[ = 32,400 \text{ (A)} \]

*Standard Cost refers to ‘Standard Cost of Standard Quantity of Actual Output’

Price Variance = Standard Cost of Actual Quantity – Actual Cost

\[ = \text{Actual Cost} \times (\text{Actual Quantity} – \text{Budgeted Quantity}) \]
\[ = SP \times AQ – AP \times AQ \]
Or

\[ AQ \times (SP - AP) \]

\[ \left( \frac{\text{\text₹2,57,400}}{\text{\text₹1.10}} \right) \times (\text{\text₹ 1.00} - \text{\text₹ 1.10}) \]

\[ = 23,400 \text{ (A)} \]

**Usage Variance**

\[ = \text{Standard Cost of Standard Quantity for Actual Production} \]
\[ - \text{Standard Cost of Actual Quantity} \]

\[ = (SQ \times SP) - (AQ \times SP) \]

\[ Or \]

\[ = (SQ - AQ) \times SP \]

\[ \left[ 9,000 \text{ units} \times 25 \text{Kg.} - \left( \frac{\text{\text₹2,57,400}}{\text{\text₹1.10}} \right) \right] \times \text{\text₹ 1.00} \]

\[ = \text{\text₹ 9,000 (A)} \]

3. **Labour Variances**

**Cost Variance**

\[ = \text{Standard Cost}^* - \text{Actual Cost} \]

\[ = SH \times SR - AH \times AR \]

\[ = \text{\text₹ 1.50} \times (5 \text{ hours} \times 9,000 \text{ units}) - \text{\text₹ 70,875} \]

\[ = \text{\text₹ 67,500} - \text{\text₹ 70,875} \]

\[ = \text{\text₹ 3,375 (A)} \]

\*Standard Cost refers to 'Standard Cost of Standard Time for Actual Output’

**Rate Variance**

\[ = \text{Standard Cost of Actual Time} - \text{Actual Cost} \]

\[ = SR \times AH - AR \times AH \]

\[ Or \]

\[ = (SR - AR) \times AH \]

\[ = (\text{\text₹ 1.50} - \text{\text₹ 1.75}) \times 40,500 \text{ hours} \]

\[ = \text{\text₹ 10,125 (A)} \]

**Efficiency Variance**

\[ = \text{Standard Cost of Standard Time for Actual Production} - \]
\[ \text{Standard Cost of Actual Time} \]

\[ = (SH \times SR) - (AH \times SR) \]

\[ Or \]
Standard Costing  5.137

= \((\text{SH} - \text{AH}) \times \text{SR}\)
= \((45,000 \text{ hours} - 40,500 \text{ hours}) \times ₹ 1.50\)
= ₹ 6,750 (F)

4. **Variable Overhead Cost Variances**

**Cost Variance**
= Standard Variable Overheads for Production – Actual Variable Overheads
= ₹1.12 \times 9,000 \text{ units} – ₹10,330
= ₹ 250 (A)

**Expenditure Variance**
= Budgeted Overheads for Actual Hours – Actual Overheads
= 40,500 \text{ hours} \times ₹ 0.224 – ₹ 10,330
= ₹ 1,258 (A)

**Efficiency Variance**
= Standard Variable Overheads for Production – Budgeted Overheads for Actual Hours
= ₹1.12 \times 9,000 \text{ units} – 40,500 \text{ hours} \times ₹ 0.224
= ₹ 1,008 (F)

5. **Fixed Overhead Variances**

**Cost Variance**
= Absorbed Fixed Overheads – Actual Fixed Overheads
= 9,000 \text{ units} \times ₹ 2.15 – ₹ 20,160
= ₹ 19,350 – ₹ 20,160
= ₹ 810 (A)

**Expenditure Variance**
= Budgeted Fixed Overheads – Actual Fixed Overheads
= ₹ 21,500 – ₹ 20,160
= ₹ 1,340 (F)

**Volume Variance**
= Absorbed Fixed Overheads – Budgeted Fixed Overheads
= ₹ 19,350 – ₹ 21,500
= ₹ 2,150 (A)

**Capacity Variance**
= Budgeted Fixed Overheads for Actual Hours – Budgeted Fixed Overheads
= 40,500 \text{ hours} \times ₹ 0.43 – ₹ 21,500
= ₹ 4,085 (A)
Efficiency Variance = Absorbed Fixed Overheads – Budgeted Fixed Overheads for Actual Hours
= ₹ 19,350 – 40,500 hours × ₹ 0.43
= ₹ 1,935 (F)

RECONCILIATION STATEMENT
(Standard and Actual Profit)

<table>
<thead>
<tr>
<th>Particulars</th>
<th>(₹)</th>
<th>(₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profit- Standard</td>
<td></td>
<td>1,28,070</td>
</tr>
<tr>
<td>Sales Margin Variances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume</td>
<td></td>
<td>N.A.</td>
</tr>
<tr>
<td>Price</td>
<td>11,250 (F)</td>
<td>11,250</td>
</tr>
<tr>
<td>Direct Material Variances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>23,400 (A)</td>
<td></td>
</tr>
<tr>
<td>Usage</td>
<td>9,000 (A)</td>
<td>(32,400)</td>
</tr>
<tr>
<td>Direct Labour Variances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labour Rate</td>
<td>10,125 (A)</td>
<td></td>
</tr>
<tr>
<td>Labour Efficiency</td>
<td>6,750 (F)</td>
<td>(3,375)</td>
</tr>
<tr>
<td>Variable Overhead Variances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenditure</td>
<td>1,258 (A)</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>1,008 (F)</td>
<td>(250)</td>
</tr>
<tr>
<td>Fixed Overhead Variances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenditure</td>
<td>1,340 (F)</td>
<td></td>
</tr>
<tr>
<td>Capacity</td>
<td>4,085 (A)</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>1,935 (F)</td>
<td>(810)</td>
</tr>
<tr>
<td>Actual Profit</td>
<td></td>
<td>1,02,485</td>
</tr>
</tbody>
</table>
## RECONCILIATION STATEMENT
(Budgeted & Actual Profit)

<table>
<thead>
<tr>
<th>Particulars</th>
<th>(₹)</th>
<th>(₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Budgeted Profit (10,000 units x ₹ 14.23)</strong></td>
<td></td>
<td>1,42,300</td>
</tr>
<tr>
<td><strong>Sales Margin Variances</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume</td>
<td>14,230 (A)</td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>11,250 (F)</td>
<td>(2,980)</td>
</tr>
<tr>
<td><strong>Direct Material Variances</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>23,400 (A)</td>
<td></td>
</tr>
<tr>
<td>Usage</td>
<td>9,000 (A)</td>
<td>(32,400)</td>
</tr>
<tr>
<td><strong>Direct Labour Variances</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labour Rate</td>
<td>10,125 (A)</td>
<td></td>
</tr>
<tr>
<td>Labour Efficiency</td>
<td>6,750 (F)</td>
<td>(3,375)</td>
</tr>
<tr>
<td><strong>Variable Overhead Variances</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenditure</td>
<td>1,258 (A)</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>1,008 (F)</td>
<td>(250)</td>
</tr>
<tr>
<td><strong>Fixed Overhead Variances</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenditure</td>
<td>1,340 (F)</td>
<td></td>
</tr>
<tr>
<td>Capacity</td>
<td>4,085 (A)</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>1,935 (F)</td>
<td>(810)</td>
</tr>
<tr>
<td><strong>Actual Profit</strong></td>
<td></td>
<td>1,02,485</td>
</tr>
</tbody>
</table>

### WORKING NOTES

1. **Standard Variable Overheads**
   
   \[ \text{Standard Variable Overheads} = \text{₹10,000} + \text{₹2,700} \times \frac{4}{9} \]
   
   \[ = \text{₹11,200} \]

2. **Std. Variable Overhead Rate per unit**
   
   \[ \text{Std. Variable Overhead Rate per unit} = \frac{\text{₹11,200}}{10,000\text{units}} \]
   
   \[ = \text{₹1.12} \]

3. **Std. Variable Overheads Rate per hour**
   
   \[ \text{Std. Variable Overheads Rate per hour} = \frac{\text{₹11,200}}{50,000\text{hours}} \]
   
   \[ = \text{₹0.224} \]
4. Actual Variable Overheads = ₹ 9,250 + ₹ 2,430 × 4/9 = ₹ 10,330
5. Budgeted Fixed Overheads = ₹ 20,000 + 5/9 × ₹ 2,700 = ₹ 21,500
6. Standard Fixed Overheads Rate per unit = ₹ 21,500 / 10,000 units = ₹ 2.15
7. Std. Fixed Overheads Rate per hour = ₹ 21,500 / 50,000 hours = ₹ 0.43
8. Actual Fixed Overheads = ₹ 18,810 + ₹ 2,430 × 5/9 = ₹ 20,160
9. Standard Hrs. for actual production = 9,000 units × (50,000 hours / 10,000 units) = 45,000 hours
10. Standard Cost per unit = ₹ 3,57,700 / 10,000 units = ₹ 35.77
11. Budgeted Margin per unit = ₹ 50 – ₹ 35.77 = ₹ 14.23
12. Standard Profit/Margin = Actual Qty. Sold × Budgeted Margin per unit = 9,000 units × ₹ 14.23 = ₹ 1,28,070
13. Computation of Actual Profit
   Actual Sales (9,000 units × ₹ 51.25) = ₹ 4,61,250
   Actual Cost of Sales = ₹ 3,58,765
   Actual Profit = Actual Sales – Actual Cost of Sales = ₹ 4,61,250 – ₹ 3,58,765 = ₹ 1,02,485
Problem-33

BOM & Co. operate a system of standard costs. For the four weeks ended 31st March, 2013 the following was their Profit and Loss Account:

<table>
<thead>
<tr>
<th>Particulars</th>
<th>₹</th>
<th>Particulars</th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Consumed</td>
<td>1,89,000</td>
<td>Transfer to Sales Deptt. 3,500 units of finished articles at ₹ 140 each</td>
<td>4,90,000</td>
</tr>
<tr>
<td>Direct Wages</td>
<td>22,100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed Expenses</td>
<td>1,88,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable Expenses</td>
<td>62,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profit</td>
<td>28,900</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4,90,000</td>
<td></td>
<td>4,90,000</td>
</tr>
</tbody>
</table>

The following further information is given:

(a) There was no opening or closing work-in-progress. The articles manufactured are identical and get transferred to sales department after manufacture.

(b) Materials were drawn for 3,600 units at ₹ 52.50 per unit.

(c) For the four week period, the standard production capacity is 4,800 units, and the break-up of the standard selling price is given below:

<table>
<thead>
<tr>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material…………………………………………………..50</td>
</tr>
<tr>
<td>Direct Wages……………………………………………..6</td>
</tr>
<tr>
<td>Fixed Expenses………………………………………...40</td>
</tr>
<tr>
<td>Variable Expenses……………………………………...20</td>
</tr>
<tr>
<td>Standard Cost of Sale……………………………..….116</td>
</tr>
<tr>
<td>Standard Profit………………………………………..24</td>
</tr>
<tr>
<td>Standard Selling Price……………………………..140</td>
</tr>
</tbody>
</table>

(d) The standard wages per article is based on 9,600 hours worked for the four-week period at a rate of ₹ 3.00 per hour. 6,400 hours were actually worked during the four-week period and, in addition, wages for 400 hours were paid to compensate for idle time due to breakdown of a machine, and the overall wage rate was ₹ 3.25.

Required

Present a Trading and Profit and Loss account indicating the comparison between standards and actual and analyse the variances.
## Solution

### COMPARISON BETWEEN STANDARD AND ACTUAL

Trading and Profit and Loss Account for 4 weeks ended 31st March, 2013

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Std. 3,500 units</th>
<th>Actual 3,500 units</th>
<th>Variance</th>
<th>Particulars</th>
<th>Std. 3,500 units</th>
<th>Actual 3,500 units</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>₹</td>
<td>₹</td>
<td>₹</td>
<td>Transfer to Sales Dept. at ₹140 each</td>
<td>₹</td>
<td>₹</td>
<td>₹</td>
</tr>
<tr>
<td>Material</td>
<td>1,75,000</td>
<td>1,89,000</td>
<td>14,000(A)</td>
<td>4,90,000</td>
<td>4,90,000</td>
<td>4,90,000</td>
<td>-</td>
</tr>
<tr>
<td>Direct Wages</td>
<td>21,000</td>
<td>22,100</td>
<td>1,100(A)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable Exp.</td>
<td>70,000</td>
<td>62,000</td>
<td>8,000(F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed Exp.</td>
<td>1,40,000</td>
<td>1,88,000</td>
<td>48,000(A)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profit</td>
<td>84,000</td>
<td>28,900</td>
<td>55,100(A)</td>
<td></td>
<td>4,90,000</td>
<td>4,90,000</td>
<td></td>
</tr>
</tbody>
</table>

### COMPUTATION OF VARIANCES

1. **Direct Material Variances**
   
   **Material Price Variance**
   
   \[ \text{Material Price Variance} = \text{Actual Quantity} \times (\text{Standard Price} - \text{Actual Price}) \]
   
   \[ = 3,600 \text{ units} \times (₹ 50.00 - ₹ 52.50) \]
   
   \[ = ₹ 9,000 \text{ (A)} \]

   **Material Usage Variance**
   
   \[ \text{Material Usage Variance} = \text{Standard Price} \times (\text{Standard Quantity} - \text{Actual Quantity}) \]
   
   \[ = ₹ 50 \times (3,500 \text{ units} - 3,600 \text{ units}) \]
   
   \[ = ₹ 5,000 \text{ (A)} \]

   **Material Cost Variance**
   
   \[ \text{Material Cost Variance} = ₹ 9,000 \text{ (A)} + ₹ 5,000 \text{ (A)} \]
   
   \[ = ₹ 14,000 \text{ (A)} \]

2. **Direct Labour Cost Variance**
   
   **Labour Rate Variance**
   
   \[ \text{Labour Rate Variance} = \text{Actual Hours} \times (\text{Standard Rate} - \text{Actual Rate}) \]
   
   \[ = 6,800 \text{ hours} \times (₹ 3.00 - ₹ 3.25) \]
   
   \[ = ₹ 1,700 \text{ (A)} \]
Labour Efficiency Variance = Standard Rate × (Standard Hours – Actual Hours)
= ₹ 3 × (3,500 units × 2 hours – 6,400 hours)
= ₹ 1,800 (F)

Idle Time Variance = Standard Rate × Idle Hours
= ₹ 3 × 400
= ₹ 1,200 (A)

Labour Cost Variance = ₹ 1,700 (A) + ₹ 1,800 (F) + ₹ 1,200 (A)
= ₹ 1,100 (A)

3. Variable Expense Variance

= Standard Variable Expenses – Actual Variable Expenses
= 3,500 units × ₹ 20 – ₹ 62,000
= ₹ 8,000 (F)

4. Fixed Expenses Variances

Expenditure Variance = Budgeted Fixed Expenses – Actual Fixed Expenses
= 4,800 units × ₹ 40 – ₹ 1,88,000
= ₹ 4,000 (F)

Volume Variance = Absorbed Fixed Expenses – Budgeted Fixed Expenses
= ₹ 40 × 3,500 units – ₹ 40 × 4,800 units
= ₹ 52,000 (A)

Capacity Variance = Std. Rate per hour × (Actual Hours – Budgeted Hours)
= ₹ 20 × (6,400 hours – 9,600 hours)
= ₹ 64,000 (A)

Efficiency Variance = Std. Rate per hour × (Std. Hours for Actual Output – Actual Hours)
= ₹ 20 × (7,000 hours – 6,400 hours)
= ₹ 12,000 (F)

Fixed Expense Variance (Total) = ₹ 4,000 (F) + ₹ 64,000 (A) + ₹ 12,000 (F)
= ₹ 48,000 (A)

5. Total Cost Variance = Direct Material Cost Variance + Direct Labour Cost Variance + Variable Expenses Variance + Fixed Expenses Variance
5.144 Advanced Management Accounting

\[ = ₹ 14,000 \text{ (A)} + 1,100 \text{ (A)} + ₹ 8,000 \text{ (F)} + ₹ 48,000 \text{ (A)} \]
\[ = ₹ 55,100 \text{ (A)} \]

6. **Profit Variance**

\[ = \text{Standard Profit} – \text{Actual Profit} \]
\[ = ₹ 84,000 – ₹ 28,900 \]
\[ = ₹ 55,100 \text{ (A)} \]

**Reconciliation of Budgeted/Standard Profit with Actual Profit with Given Variances**

**Problem-34**

Tsim Sha Tsui Ltd. adopts a standard costing system. The standard output for a period is 20,000 units and the standard cost and profit per unit is as under:

<table>
<thead>
<tr>
<th></th>
<th>(₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct Material</strong></td>
<td></td>
</tr>
<tr>
<td>(3 units @ ₹ 1.50)</td>
<td>4.50</td>
</tr>
<tr>
<td><strong>Direct Labour</strong></td>
<td></td>
</tr>
<tr>
<td>(3 hrs. @ ₹ 1.00)</td>
<td>3.00</td>
</tr>
<tr>
<td><strong>Direct Expenses</strong></td>
<td>0.50</td>
</tr>
<tr>
<td><strong>Factory Overheads</strong></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>0.25</td>
</tr>
<tr>
<td>Fixed</td>
<td>0.30</td>
</tr>
<tr>
<td><strong>Administration Overheads</strong></td>
<td>0.30</td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td>8.85</td>
</tr>
<tr>
<td><strong>Profit</strong></td>
<td>1.15</td>
</tr>
<tr>
<td><strong>Selling Price (Fixed by Govt.)</strong></td>
<td>10.00</td>
</tr>
</tbody>
</table>

The actual production and sales for a period was 14,400 units. There has been no price revision by the Govt. during the period.

The following are the variances worked out at the end of the period:

<table>
<thead>
<tr>
<th></th>
<th>Favourable(₹)</th>
<th>Adverse(₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct Material</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>----</td>
<td>4,250</td>
</tr>
<tr>
<td>Usage</td>
<td>1,050</td>
<td>----</td>
</tr>
<tr>
<td><strong>Direct Labour</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate</td>
<td>----</td>
<td>4,000</td>
</tr>
<tr>
<td>Efficiency</td>
<td>3,200</td>
<td>----</td>
</tr>
</tbody>
</table>
Required

(a) Ascertain the details of actual costs and prepare a Profit and Loss Statement for the period showing the actual profit/loss. Show workings clearly.

(b) Reconcile the Actual Profit with Standard Profit.

Solution

WORKING NOTE

<table>
<thead>
<tr>
<th></th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Material Cost as per Standard (14,400 units x ₹4.50)</td>
<td>64,800</td>
</tr>
<tr>
<td>Add: Price Variance (A)</td>
<td>4,250</td>
</tr>
<tr>
<td>Less: Usage Variance (F)</td>
<td>1,050</td>
</tr>
<tr>
<td>Actual Material cost</td>
<td>68,000</td>
</tr>
<tr>
<td>(2) Labour Cost as per Standard (14,400 units x ₹3.00)</td>
<td>43,200</td>
</tr>
<tr>
<td>Add: Rate Variance (A)</td>
<td>4,000</td>
</tr>
<tr>
<td>Less: Efficiency Variance (F)</td>
<td>3,200</td>
</tr>
<tr>
<td>Actual Labour Cost</td>
<td>44,000</td>
</tr>
<tr>
<td>(3) Factory Overheads as per Standard: Variable</td>
<td>3,600</td>
</tr>
<tr>
<td>Factory Overheads as per Standard: Fixed</td>
<td>4,320</td>
</tr>
<tr>
<td>Total Factory Overheads</td>
<td>7,920</td>
</tr>
<tr>
<td>Add: Fixed Overheads Volume Variance (A)</td>
<td>1,680</td>
</tr>
<tr>
<td>Less: Fixed Overheads Expenditure Variance (F)</td>
<td>400</td>
</tr>
</tbody>
</table>
5.146 Advanced Management Accounting

<table>
<thead>
<tr>
<th>Less: Variable Overheads Expenditure Variance (F)</th>
<th>400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Factory Overheads</td>
<td>8,800</td>
</tr>
</tbody>
</table>

(4)

| Administration Overheads as per Standard         | 4,320 |
| Add: Expenditure Variance (A)                    | 400   |
| Add: Volume Variance (A)                         | 1,680 |
| Actual Administration Overheads                  | 6,400 |

PROFIT & LOSS STATEMENT SHOWING THE ACTUAL PROFIT FOR THE PERIOD

<table>
<thead>
<tr>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales 14,400 units @ ₹ 10 each</td>
</tr>
<tr>
<td>Less: Cost of Sales:</td>
</tr>
<tr>
<td>Material Cost (W.N.1)</td>
</tr>
<tr>
<td>Labour Cost (W.N.2)</td>
</tr>
<tr>
<td>Direct Expenses</td>
</tr>
<tr>
<td>Factory Overheads (W.N.3)</td>
</tr>
<tr>
<td>Administration Overheads (WN 4)</td>
</tr>
<tr>
<td>Actual Profit</td>
</tr>
</tbody>
</table>

RECONCILIATION STATEMENT OF THE ACTUAL PROFIT WITH STANDARD PROFIT

<table>
<thead>
<tr>
<th>Variances</th>
<th>Favourable</th>
<th>Adverse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Profit (on 14,400 units @ ₹ 1.15 per unit)</td>
<td></td>
<td>16,560</td>
</tr>
<tr>
<td>Direct Material Variances:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>----</td>
<td>4,250</td>
</tr>
<tr>
<td>Usage</td>
<td>1,050</td>
<td>----</td>
</tr>
<tr>
<td>Direct Labour Variances:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate</td>
<td>----</td>
<td>4,000</td>
</tr>
<tr>
<td>Efficiency</td>
<td>3,200</td>
<td>----</td>
</tr>
<tr>
<td>Factory Overheads Variances:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Problem-35

The budget output of a single product manufacturing company for 2013-14 was 5,000 units. The financial results in respect of the actual output of 4,800 units achieved during the year were as under:–

<table>
<thead>
<tr>
<th>Item</th>
<th>Actual</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material</td>
<td>29,700</td>
<td></td>
</tr>
<tr>
<td>Direct Wages</td>
<td>44,700</td>
<td></td>
</tr>
<tr>
<td>Variable Overheads</td>
<td>72,750</td>
<td></td>
</tr>
<tr>
<td>Fixed Overheads</td>
<td>39,000</td>
<td></td>
</tr>
<tr>
<td>Profit</td>
<td>36,600</td>
<td></td>
</tr>
<tr>
<td>Sales</td>
<td>2,22,750</td>
<td></td>
</tr>
</tbody>
</table>

The standard direct wage rate is ₹4.50 per hour and the standard variable overhead rate is ₹7.50 per hour.

The cost accounts recorded the following variances for the year:–

<table>
<thead>
<tr>
<th>Variances</th>
<th>Favourable</th>
<th>Adverse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Price</td>
<td>—</td>
<td>300</td>
</tr>
<tr>
<td>Material Usage</td>
<td>—</td>
<td>600</td>
</tr>
<tr>
<td>Wage Rate</td>
<td>750</td>
<td>—</td>
</tr>
<tr>
<td>Labour Efficiency</td>
<td>—</td>
<td>2,250</td>
</tr>
<tr>
<td>Variable Overhead Expense</td>
<td>3,000</td>
<td>—</td>
</tr>
<tr>
<td>Variable Overhead Efficiency</td>
<td>—</td>
<td>3,750</td>
</tr>
<tr>
<td>Fixed Overhead Expense</td>
<td>—</td>
<td>1,500</td>
</tr>
<tr>
<td>Selling Price</td>
<td>6,750</td>
<td>—</td>
</tr>
</tbody>
</table>
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**Required**

(i) Prepare a statement showing the original budget.

(ii) Prepare the standard product cost sheet per unit.

(iii) Prepare a statement showing the reconciliation of originally budgeted profit and the actual profit.

**Solution**

**WORKING NOTE**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Actual Sales</td>
<td>2,22,750</td>
</tr>
<tr>
<td>Less: Price Variance (F)</td>
<td>6,750</td>
</tr>
<tr>
<td>Standard Sales</td>
<td>2,16,000</td>
</tr>
<tr>
<td>Units Sold</td>
<td>4,800</td>
</tr>
<tr>
<td>Std. Price per unit: 2,16,000/4,800 = ₹45</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b) Actual Cost of Material</td>
<td>29,700</td>
</tr>
<tr>
<td>Less: Price Variance (A)</td>
<td>300</td>
</tr>
<tr>
<td>Less: Usage Variance (A)</td>
<td>600</td>
</tr>
<tr>
<td>Standard Cost</td>
<td>28,800</td>
</tr>
<tr>
<td>Units Produced</td>
<td>4,800</td>
</tr>
<tr>
<td>Standard Material Cost per unit: 28,800/4,800 = ₹6</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>(c) Direct Wages Spent</td>
<td>44,700</td>
</tr>
<tr>
<td>Add: Wage Rate Variance (F)</td>
<td>750</td>
</tr>
<tr>
<td>Less: Efficiency Variance (A)</td>
<td>2,250</td>
</tr>
<tr>
<td>Standard Wages</td>
<td>43,200</td>
</tr>
<tr>
<td>Standard Wage Rate per unit: 43,200/4,800 = ₹9</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>(d) Standard Direct Wage Rate per hour</td>
<td>4.50</td>
</tr>
<tr>
<td>Hence Standard Time per unit: ₹9 / ₹4.50 = 2 hours</td>
<td></td>
</tr>
</tbody>
</table>
(e) Variable Overheads:
Standard Rate per hour: 7.50
Variable Overhead Rate per unit: 2 hours × ₹7.50 = ₹15

(f) Fixed Overheads Spent (Actual Fixed Overheads) 39,000
Less: Fixed Overheads Expense Variance (A) 1,500
Budgeted Overheads 37,500
Standard Fixed Overhead Rate per unit: \( \frac{₹37,500}{5,000\text{units}} = ₹7.5 \)

(g) Fixed Overheads Recovered/Absorbed: (4,800 units × ₹7.50) ₹36,000
(h) Fixed Overhead Volume Variance: (₹36,000 – ₹37,500) ₹1,500(A)
(i) Budgeted Sales: (5,000 units × ₹45) ₹2,25,000
(j) Standard Sales: (4,800 units × ₹45) ₹2,16,000
(k) Actual Sales: ₹2,22,750
(l) Sales Volume Variance: (₹2,16,000 – ₹2,25,000) ₹9,000(A)
(m) Sales Price Variance: (₹2,22,750 – ₹2,16,000) ₹6,750(F)

STATEMENT SHOWING THE ORIGINAL BUDGET

Budgeted Sales (5,000 units × ₹45) 2,25,000
Less:
Direct Materials (5,000 units × ₹6) 30,000
Direct Wages (5,000 units × ₹9) 45,000
Variable Overheads (5,000 units × ₹15) 75,000
Fixed Overheads (5,000 units × ₹7.50) 37,500
Budgeted Profit 37,500

STANDARD PRODUCT COST SHEET PER UNIT

<table>
<thead>
<tr>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Materials  6.00</td>
</tr>
<tr>
<td>Direct Wages 9.00</td>
</tr>
<tr>
<td>Prime Cost 15.00</td>
</tr>
<tr>
<td>Variable Overheads 15.00</td>
</tr>
<tr>
<td>Fixed Overheads 7.50</td>
</tr>
<tr>
<td>Total Cost 37.50</td>
</tr>
<tr>
<td>Profit 7.50</td>
</tr>
<tr>
<td>Selling Price 45.00</td>
</tr>
</tbody>
</table>
Advanced Management Accounting

STATEMENT SHOWING RECONCILIATION OF ORIGINALLY BUDGETED PROFIT AND THE ACTUAL PROFIT

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget Profit</td>
<td>37,500</td>
</tr>
<tr>
<td>Less: Sales Margin Volume Variance (A): [₹ 9,000 (A) \times 16\frac{2}{3}%]</td>
<td>1,500</td>
</tr>
<tr>
<td>Add: Sales Price Variance (F)</td>
<td>6,750</td>
</tr>
<tr>
<td>Add: Favourable Cost Variances:</td>
<td></td>
</tr>
<tr>
<td>Wage Rate</td>
<td>750</td>
</tr>
<tr>
<td>Variable Overhead Expense</td>
<td>3,000</td>
</tr>
<tr>
<td>Less: Adverse Cost Variances:</td>
<td></td>
</tr>
<tr>
<td>Material Price</td>
<td>300</td>
</tr>
<tr>
<td>Material Usage</td>
<td>600</td>
</tr>
<tr>
<td>Labour Efficiency</td>
<td>2,250</td>
</tr>
<tr>
<td>Variable Overhead Efficiency</td>
<td>3,750</td>
</tr>
<tr>
<td>Fixed Overhead Volume Variance [Refer W.N. (h)]</td>
<td>1,500</td>
</tr>
<tr>
<td>Fixed Overhead Expense</td>
<td>1,500</td>
</tr>
<tr>
<td>Actual Profit</td>
<td>36,600</td>
</tr>
</tbody>
</table>

* Budgeted Net Profit Ratio = \( \frac{97.5}{45} \times 100 = 16.2\% \)

Sales Price Variance is equal to Sales Margin Price Variance. This is because, for the actual quantity sold, standard cost remaining constant, change in selling price will have equal impact or turnover and profit.

Sales Margin Volume Variance is equal to Sales Volume Variance \times Budgeted Net Profit Ratio

\[
\text{Sales Volume Variance} \times \frac{\text{Budgeted Net Profit Ratio}}{\text{Budgeted Net Profit Ratio}} = \text{Budgeted Price} \times (\text{Actual Qty.} - \text{Budgeted Qty.}) \times \frac{\text{Budgeted Margin}}{\text{Budgeted Price}}
\]

\[= \text{Budgeted Margin} \times (\text{Actual Qty.} - \text{Budgeted Qty.}) \]

\[= \text{Sales Margin Volume Variance} \]
Problem-36

Jagan Manufacturing Company has furnished the following financial data relating to the actual output of 9,600 units produced in the last quarter:

<table>
<thead>
<tr>
<th></th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>4,45,500</td>
</tr>
<tr>
<td>Costs:</td>
<td></td>
</tr>
<tr>
<td>Direct Materials</td>
<td>59,400</td>
</tr>
<tr>
<td>Direct Wages</td>
<td>89,400</td>
</tr>
<tr>
<td>Variable Overheads</td>
<td>1,45,500</td>
</tr>
<tr>
<td>Fixed Overheads</td>
<td>78,000</td>
</tr>
<tr>
<td>Profit</td>
<td>3,72,300</td>
</tr>
<tr>
<td></td>
<td>73,200</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th></th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Materials</td>
<td></td>
</tr>
<tr>
<td>Price Variance</td>
<td>600 (A)</td>
</tr>
<tr>
<td>Usage Variance</td>
<td>1,200 (A)</td>
</tr>
<tr>
<td>Direct Wages</td>
<td></td>
</tr>
<tr>
<td>Rate Variance</td>
<td>1,500 (F)</td>
</tr>
<tr>
<td>Efficiency Variance</td>
<td>4,500 (A)</td>
</tr>
<tr>
<td>Variable Overheads</td>
<td></td>
</tr>
<tr>
<td>Expense Variance</td>
<td>6,000 (F)</td>
</tr>
<tr>
<td>Efficiency Variance</td>
<td>7,500 (A)</td>
</tr>
<tr>
<td>Fixed Overheads</td>
<td></td>
</tr>
<tr>
<td>Expense Variance</td>
<td>3,000 (A)</td>
</tr>
<tr>
<td>Sales</td>
<td></td>
</tr>
<tr>
<td>Price Variance</td>
<td>13,500 (F)</td>
</tr>
</tbody>
</table>

Required

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

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

**WORKING NOTE**

**Direct Material**

Material Cost Variance  = Material Price Variance + Material Usage Variance

= ₹ 600 (A) + ₹ 1,200 (A)

= ₹ 1,800 (A)

Material Cost Variance  = Standard Cost’ – Actual Cost

⇒ ₹ 1,800 (A)  =  Standard Cost – ₹ 59,400

⇒ Standard Cost  = ₹ 57,600

(*) Standard Cost refers to *Standard Cost of Standard Quantity for Actual Output*

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

⇒ ₹ 600 (A)  =  Standard Cost of Actual Quantity – ₹ 59,400

⇒ Standard Cost of Actual Quantity  = ₹ 58,800

Standard Cost per unit  = \( \frac{₹57,600}{9,600 \text{ units}} \)

= ₹ 6

**Direct Labour**

Labour Cost Variance  = Standard Cost’ – Actual Cost

⇒ ₹ 3,000 (A)  =  Standard Cost – ₹ 89,400

⇒ Standard Cost  = ₹ 86,400

(*) Standard Cost refers to *Standard Cost of Standard Time for Actual Output/Production*

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

⇒ ₹ 1,500 (F)  =  Standard Cost of Actual Time – ₹ 89,400

⇒ Standard Cost of Actual Time  = ₹ 90,900

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Standard Costing 5.153

Standard Cost per unit = \( \frac{\text{₹86,400}}{9,600 \text{ units}} \)

= ₹ 9

Standard Rate per hour = ₹ 4.50

Standard Time per unit = \( \frac{\text{₹9.00}}{\text{₹4.50}} \)

= 2 hrs.

Variable Overheads

Standard Rate per hour = ₹ 7.50

Standard Rate per unit = ₹ 7.50 × 2 hrs.

= ₹ 15.00

Fixed Overheads

Expenditure Variance = Budgeted Fixed Overheads – Actual Fixed Overheads

⇒ ₹ 3,000 (A) = Budgeted Fixed Overheads – ₹ 78,000

⇒ Budgeted Fixed Overheads = ₹ 75,000

Standard Rate per unit = \( \frac{\text{₹75,000}}{10,000 \text{ units}} \)

= ₹ 7.50

Volume Variance = Absorbed Fixed Overheads – Budgeted Fixed Overheads

= ₹ 7.50 × 9,600 units – ₹ 75,000

= ₹ 3,000 (A)

Sales Variances (Turnover Based)

Price Variance = Actual Sales – Standard Sales

⇒ ₹ 13,500 (F) = ₹ 4,45,500 – Standard Sales

⇒ Standard Sales = ₹ 4,32,000

Budgeted Price per unit = \( \frac{\text{StandardSales}}{\text{Actual Quantity}} \)
Volume Variance = Standard Sales – Budgeted Sales
= ₹4,32,000 – ₹45 × 10,000 units
= ₹18,000 (A)

Sales Variances (Margin Based)
Sales Margin Price Variance
= Sales Price Variance
= ₹13,500 (F)

ORIGINAL BUDGET AND STANDARD COST SHEET

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Budget (₹)</th>
<th>Standard Cost Per Unit (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>…(A) 4,50,000</td>
<td>45.00</td>
</tr>
<tr>
<td>Direct Materials @ ₹ 6 per unit</td>
<td>60,000</td>
<td>6.00</td>
</tr>
<tr>
<td>Direct Wages @ ₹ 9 per unit</td>
<td>90,000</td>
<td>9.00</td>
</tr>
<tr>
<td>Variable Overheads @ ₹ 15 per unit</td>
<td>1,50,000</td>
<td>15.00</td>
</tr>
<tr>
<td>Fixed overheads @ ₹ 7.50 per unit</td>
<td>75,000</td>
<td>7.50</td>
</tr>
<tr>
<td>Total Cost</td>
<td>…(B) 3,75,000</td>
<td>37.50</td>
</tr>
<tr>
<td>Budgeted Profit</td>
<td>…(A-B) 75,000</td>
<td>7.50</td>
</tr>
</tbody>
</table>

Sales Margin Volume Variance = Sales Volume Variance × Budgeted Net Profit Ratio

= 18,000 (A) × \( \frac{\text{₹7.5}}{\text{₹45}} \) × 100

= ₹3,000 (A)

STATEMENT OF RECONCILIATION (Budgeted and Actual Profit)

<table>
<thead>
<tr>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Profit</td>
</tr>
<tr>
<td>Less: Sales Margin Volume Variance</td>
</tr>
<tr>
<td>Standard Profit</td>
</tr>
</tbody>
</table>
Add: Sales Price Variance
Less: Material Usage Variance
Less: Material Price Variance
Less: Labour Efficiency Variance
Add: Labour Rate Variance
Less: Variable Overhead Efficiency Variance
Add: Variable Overhead Expense Variance
Less: Fixed Overhead Volume Variance
Less: Fixed Overhead Expense Variance
Actual Profit

73,200

Reconciliation of Budgeted Profit with Actual Profit with Given
Budgeted Profit & Loss Account and Actual Profit & Loss
Account

Problem-37

The following information is available from the record of Prince Ltd. which produces only one
product:

Budgeted Income Statement: January 2013

<table>
<thead>
<tr>
<th></th>
<th>(₹)</th>
<th>(₹)</th>
<th>(₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Revenue</td>
<td></td>
<td></td>
<td>1,00,000</td>
</tr>
<tr>
<td>(20,000 units at ₹ 5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production Costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Budgeted Production 20,000 units)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Materials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A (10,000 Kg. @ ₹ 0.30)</td>
<td>3,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B (10,000 Kg. @ ₹ 0.70)</td>
<td>7,000</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Direct Labour</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled (9,000 Hrs. @ ₹ 3.00)</td>
<td>27,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Un-Skilled (5,200 Hrs. @ ₹ 2.50)</td>
<td>13,000</td>
<td>40,000</td>
<td></td>
</tr>
<tr>
<td>Production Overhead</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed</td>
<td>20,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable (20,000 units @ ₹ 0.50)</td>
<td>10,000</td>
<td>30,000</td>
<td>80,000</td>
</tr>
</tbody>
</table>
Add: Opening Stock
(1,000 units @ ₹4.00) 4,000

Less: Closing Stock
(1,000 units @ ₹4.00) 4,000 80,000

Budgeted Profit 20,000

During January 2013 production and sales were both above budget and the following income statement was prepared:

Income Statement January 2013

Sales Revenue
(14,000 units at ₹5) 70,000
(8,000 units at ₹4.75) 38,000 1,08,000

Production Costs
(Actual Production 24,000 units)

Direct Materials
A (16,000 Kg. @ ₹0.20) 3,200
B (10,000 Kg. @ ₹0.80) 8,000 11,200

Direct Labour
Skilled (13,000 Hrs. @ ₹2.95) 38,350
Un–Skilled (6,300 Hrs. @ ₹2.60) 16,380 54,730

Production Overhead
Fixed 18,020
Variable (24,000 units @ ₹0.625) 15,000 33,020 98,950

Add: Opening Stock
(1,000 units @ ₹4) 4,000

Less: Closing Stock
(3,000 units @ ₹4) 12,000 90,950

Actual Profit 17,050

During the period 1,000 abnormal idle hours for skilled labour due to machine break – down was reported. In the above statement stock is valued at standard cost of ₹4 per unit.

Required

Prepare a standard costing statement analysing the differences between the budget and the actual performance. In your analysis include calculations of the sales volume and sales price variance; direct material price, mix, yield and usage variances; direct labour rate, idle time and efficiency variances; variable overhead cost variance; fixed overhead expenditure and volume variances.
### Solution

**RECONCILIATION OF ACTUAL & BUDGETED PROFIT**

<table>
<thead>
<tr>
<th>Reference of Working Note</th>
<th>Variance</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Favourable</td>
<td>Adverse</td>
</tr>
<tr>
<td>Budgeted Profit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales Margin Volume Variance</td>
<td>1</td>
<td>2,000</td>
</tr>
<tr>
<td>Sales Margin Price Variance</td>
<td>2</td>
<td>--</td>
</tr>
<tr>
<td>Material:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Price</td>
<td>3</td>
<td>600</td>
</tr>
<tr>
<td>- Mix</td>
<td>4</td>
<td>1,200</td>
</tr>
<tr>
<td>- Yield</td>
<td>5</td>
<td>--</td>
</tr>
<tr>
<td>Labour:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Rate</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>- Efficiency</td>
<td>7</td>
<td>--</td>
</tr>
<tr>
<td>- Idle Time</td>
<td>8</td>
<td>--</td>
</tr>
<tr>
<td>Variable Overhead:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Cost</td>
<td>9</td>
<td>--</td>
</tr>
<tr>
<td>Fixed Overhead:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Expenditure</td>
<td>10</td>
<td>1,980</td>
</tr>
<tr>
<td>- Volume</td>
<td>11</td>
<td>4,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9,800</td>
</tr>
</tbody>
</table>

**Actual Profit**  
17,050

**WORKING NOTE**

1. **Sales Margin Volume Variance**  
   = Standard Margin – Budgeted Margin  
   = \((BM \times AQ) – (BM \times BQ)\)  
   Or  
   = \((AQ – BQ) \times BM\)  
   = \((22,000 \text{ units} – 20,000 \text{ units}) \times ₹1\)  
   = ₹2,000 (F)

2. **Sales Margin Price Variance**  
   = Sales Price Variance  
   = Actual Sales – Standard Sales  
   = \((AP \times AQ) – (BP \times AQ)\)
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Or

\[ (AP - BP) \times AQ \]
\[ = 14,000 \text{ units} \times (\₹ 5 - \₹ 5) + 8,000 \text{ units} \times (\₹ 4.75 - \₹ 5) \]
\[ = ₹2,000 (A) \]

Sales Price Variance is equal to Sales Margin Price Variance. This is because, for the actual quantity sold, standard cost remaining constant, change in selling price will have equal impact or turnover and profit.

3. Material Price Variance

\[ = \text{Standard Cost of Actual Quantity} - \text{Actual Cost} \]
\[ = (SP \times AQ) - (AP \times AQ) \]
Or

\[ = (SP - AP) \times AQ \]

A:  
\[ = (₹0.30 - ₹0.20) \times 16,000 \text{ Kg.} \]
\[ = ₹1,600 (F) \]

B:  
\[ = (₹0.70 - ₹0.80) \times 10,000 \text{ Kg.} \]
\[ = ₹1,000 (A) \]

Total  
\[ = ₹1,600 (F) + ₹1,000 (A) \]
\[ = ₹2,600 (F) \]

4. Material Mix Variance

\[ = \text{Total Actual Quantity}(\text{units}) \times (\text{Average Standard per unit of Standard Mix} - \text{Average Standard Price per unit of Actual Mix}) \]
\[ = 26,000 \text{ Kg.} \times \\
\[ \left( \frac{₹10,000}{20,000 \text{ Kg.}} - \frac{₹0.30 \times ₹16,000 + ₹0.70 \times ₹10,000}{26,000 \text{ Kg.}} \right) \]
\[ = ₹1,200 (F) \]

5. Material Yield Variance

\[ = \text{Average Standard Price per unit of Standard Mix} \times \]
\[ \left[ \text{Total Standard Quantity (units)} - \text{Total Actual Quantity (units)} \right] \]
\[ = \left( \frac{₹10,000}{20,000 \text{ Kg.}} \right) \times \]
6. **Labour Rate Variance**

\[
\text{Labour Rate Variance} = \text{Standard Cost of Actual Time} - \text{Actual Cost}
\]

\[
= (\text{SR} \times \text{AH}^\ast) - (\text{AR} \times \text{AH}^\ast)
\]

Or

\[
= (\text{SR} - \text{AR}) \times \text{AH}^\ast
\]

- **Skilled labour**

\[
= (\mathbf{3} - 2.95) \times 13,000 \text{ hrs.} \\
= \mathbf{650 (F)}
\]

- **Un-Skilled Labour**

\[
= (\mathbf{2.5} - 2.60) \times 6,300 \text{ hrs} \\
= \mathbf{630 (A)}
\]

**Total**

\[
= \mathbf{20 (F)}
\]

7. **Labour Efficiency Variance**

\[
\text{Labour Efficiency Variance} = \text{Standard Cost of Standard Time for Actual Production} - \text{Standard Cost of Actual Time}
\]

\[
= (\text{SH} \times \text{SR}) - (\text{AH}^\ast \times \text{SR})
\]

Or

\[
= (\text{SH} - \text{AH}^\ast) \times \text{SR}
\]

- **Skilled Labour**

\[
= (10,800 \text{ hrs.}^1 - 12,000 \text{ hrs.}) \times 3 \\
= \mathbf{3,600 (A)}
\]

\[
^1 \frac{24,000 \text{ units}}{20,000 \text{ units}} \times \frac{9,000 \text{ hours}}{20,000 \text{ units}}
\]

- **Un-Skilled Labour**

\[
= (6,240 \text{ hrs}^2 - 6,300 \text{ hrs.}) \times 2.50 \\
= \mathbf{150 (A)}
\]

\[
^2 \frac{24,000 \text{ units}}{20,000 \text{ units}} \times \frac{5,200 \text{ hours}}{20,000 \text{ units}}
\]

**Total**

\[
= \mathbf{3,750 (A)}
\]

8. **Idle Time Variance**

\[
\text{Idle Time Variance} = \text{Standard Rate per Hour} \times \text{Actual Idle Hours}
\]

\[
= (\text{AH}^\ast \times \text{SR}) - (\text{AH}^\ast \times \text{SR})
\]

Or

\[
= (\text{AH}^\ast - \text{AH}^\ast) \times \text{SR}
\]
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Skilled Labour

\[ = (13,000 \text{ hrs.} - 12,000 \text{ hrs.}) \times \text{₹} 3 \]

\[ = \text{₹} 3,000 (A) \]

Note

AH* refers to Actual Hours paid for;
AH# refers to Actual Hours worked

9. Variable Overhead Cost Variance

\[ = \text{Standard Variable Overheads for Production} - \text{Actual Variable Overheads} \]

\[ = 24,000 \text{ units} \times \text{₹} 0.50 - \text{₹} 15,000 \]

\[ = \text{₹} 3,000 (A) \]

10. Fixed Overhead Expenditure Variance

\[ = \text{Budgeted Fixed Overheads} - \text{Actual Fixed Overheads} \]

\[ = \text{₹} 20,000 - \text{₹} 18,020 \]

\[ = \text{₹} 1,980 (F) \]

11. Fixed Overhead Volume Variance

\[ = \text{Absorbed Fixed Overheads} - \text{Budgeted Fixed Overheads} \]

\[ = 24,000 \text{ units} \times \text{₹} 1 - \text{₹} 20,000 \]

\[ = \text{₹} 4,000 (F) \]

Information Required, Given Reconciliation between Budgeted/Standard Profit with Actual Profit

Problem-38

The following profit reconciliation statement has been prepared by the Cost Accountant of GHI Ltd. for March, 2013:

\[ \text{₹} \]

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget Profit</td>
<td>3,60,000</td>
</tr>
<tr>
<td>Sales Price Variance</td>
<td>76,500 (F)</td>
</tr>
<tr>
<td>Sales Volume Profit Variance</td>
<td>63,000 (A)</td>
</tr>
<tr>
<td>Material Price Variance</td>
<td>23,820 (A)</td>
</tr>
<tr>
<td>Material Usage Variance</td>
<td>4,800 (F)</td>
</tr>
<tr>
<td>Labour Rate Variance</td>
<td>1,17,600 (F)</td>
</tr>
</tbody>
</table>
Labour Efficiency Variance  |  48,000 (A)  
Variable Overhead Expenditure Variance  |  12,000 (F)  
Variable Overhead Efficiency Variance  |  18,000 (A)  
Fixed Overhead Volume Variance  |  2,94,000 (A)  
Fixed Overhead Expenditure Variance  |  6,000 (F)  
Actual Profit  |  1,30,080  

Budgeted production and sales volumes for March, 2013 were equal and the level of finished goods stock was unchanged, but the stock of raw materials decreased by 6,400 kg (valued at standard price) during the month.

The standard cost card is as under:

| Material 4 kg @ ₹ 3.00 | 12.00 |
| Labour 4 hours @ ₹ 48.00 | 192.00 |
| Variable Overhead 4 hours @ ₹ 18.00 | 72.00 |
| Fixed Overheads 4 hours @ ₹ 42.00 | 168.00 |
| Standard Cost | 444.00 |
| Standard Profit | 36.00 |
| Standard Selling Price | 480.00 |

Required
(i) Calculate actual quantity of material purchased
(ii) Calculate actual production and sales volume
(iii) Calculate actual number of hours worked
(iv) Calculate actual variable and fixed overhead cost incurred.

Solution

COMPUTATION OF REQUIREMENTS

Actual Production & Sales Volume

Fixed Overhead Volume Variance  =  Standard Fixed Overhead Rate per Unit × (Actual Output – Budgeted Output*)

\[ ₹ 2,94,000 (A) = ₹ 168 \times (Actual \ Output – 10,000 \ units) \]

⇒ Actual Output  =  8,250 units
5.162  Advanced Management Accounting

*Budgeted Output = \frac{\text{Budgeted Profit}}{\text{Budgeted Profit per unit}}

= \frac{\text{₹ 3,60,000}}{36}

= 10,000 units

*Alternative

Sales Margin Volume Variance = \text{Standard Margin} – \text{Budgeted Margin}

= \text{Budgeted Margin} \times \text{Actual Qty.} – \text{Budgeted Margin} \times \text{Budgeted Qty}

\Rightarrow \text{Actual Qty.} = \frac{\text{₹ 63,000(A)}}{36} \times (\text{Actual Qty.} – 10,000 units)

Actual Quantity of Material Purchased

Material Usage Variance = \text{Standard Cost of Standard Quantity for Actual Output} – \text{Standard Cost of Actual Quantity}

= \text{Standard Qty.} \times \text{Standard Price} – \text{Actual Qty.} \times \text{Standard Price}

\Rightarrow \text{Actual Qty.} = \frac{\text{₹ 4,800 (F)}}{3} \times (8,250 \text{ units} \times 4 \text{ Kg} – \text{Actual Qty.})

Actual Hours Worked

Labour Efficiency Variance = \text{Standard Cost of Standard Time for Actual Output} – \text{Standard Cost for Actual Time}

= \text{Standard Hours} \times \text{Standard Rate} – \text{Actual Hours} \times \text{Standard Rate}

\Rightarrow \text{Actual Hours} = \frac{\text{₹ 48,000 (A)}}{48} \times (8,250 \text{ units} \times 4 \text{ Hrs.} – \text{Actual Hours})


Standard Costing  5.163

⇒ Actual Hours  =  34,000 Hrs.

Actual Fixed Overhead and Actual Variable Overhead Incurred

Variable Overhead Cost Variance  =  Standard Variable Overheads for Production – Actual Variable Overheads
Or
=  (Standard/Budgeted Variable Overhead per unit × Actual Production in Units) – (Actual Variable Overheads)

⇒ ₹ 12,000 (F) + ₹ 18,000 (A)  =  ₹ 72 × 8,250 units – Actual Variable Overheads

⇒ Actual Variable Overheads  =  ₹ 6,00,000

Fixed Overhead Cost Variance  =  Absorbed Fixed Overheads – Actual Fixed Overheads
Or
=  (Standard Fixed Overhead Rate per Unit × Actual Production in units) – (Actual Fixed Overheads)

⇒ ₹ 6,000 (F) + ₹ 2,94,000 (A) =  ₹ 168 × 8,250 units – Actual Variable Overheads

⇒ Actual Fixed Overheads  =  ₹ 16,74,000

Problem-39

The following is the Operating Statement of a company for April 2013:

<table>
<thead>
<tr>
<th></th>
<th>Favourable (₹)</th>
<th>Adverse (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Budgeted Profit</strong></td>
<td></td>
<td>1,00,000</td>
</tr>
<tr>
<td><strong>Variances:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales</td>
<td>Volume</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>Price</td>
<td>9,600</td>
</tr>
<tr>
<td><strong>Direct Material</strong></td>
<td>Price</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>Usage</td>
<td>----</td>
</tr>
<tr>
<td><strong>Direct Labour</strong></td>
<td>Rate</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>Efficiency</td>
<td>3,600</td>
</tr>
<tr>
<td><strong>Fixed Overheads</strong></td>
<td>Efficiency</td>
<td>2,400</td>
</tr>
<tr>
<td></td>
<td>Capacity</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>Expense</td>
<td>1,400</td>
</tr>
<tr>
<td><strong>Actual Profit</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Additional information is as under:

Budget for the year……………………………………… 1,20,000 units

Budgeted fixed overheads………………………………₹ 4,80,000 per annum

Standard cost of one unit of product is:

Direct Materials………………………………………………… 5 Kg. @ ₹ 4 per Kg.

Direct Labour………………………………………………… 2 hours @ ₹ 3 per hour

Fixed overheads are absorbed on direct labour hour basis.

Profit………………………………………………………………25% on sales

Required

Prepare the Annual Financial Profit / Loss Statement for April, 2013 in the following format:

<table>
<thead>
<tr>
<th>Account</th>
<th>Qty./ Hours</th>
<th>Rate / Price (₹)</th>
<th>Actual Value (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Direct Materials</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Direct Labour</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Fixed Overheads</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Total Costs</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Profit</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

Solution

WORKING NOTES

1. (a) Budgeted Fixed Overhead (per unit): \[\text{Budgeted Fixed Overhead (per unit)} = \frac{\text{Budgeted Fixed Overhead per annum}}{\text{Budgeted Output for the year}}\]

   \[= \frac{₹ 4,80,000}{1,20,000 \text{ units}}\]

   \[= ₹ 4 \text{ (per unit)}\]

(b) Budgeted Fixed Overhead Hour:

   \[\text{Budgeted Fixed Overhead Hour:} = \frac{\text{Budgeted Fixed Overhead per unit}}{\text{Standard Labour Hours per unit}}\]

   \[= \frac{₹ 4}{2 \text{ hours}}\]

   \[= ₹ 2 \text{ per hour}\]
2. Statement showing Standard Cost and Budgeted Selling Price

(a) Standard Cost (per unit) (₹)
- Direct Material 20
  (5 kg. × ₹ 4/- per kg.)
- Direct Labour 6
  (2 hours × ₹ 3/- per hour)
- Fixed Overhead 4
  (2 hours × ₹ 2)
- Total Standard Cost (per unit) 30

(b) Budgeted Selling Price (per unit)
- Standard Cost (per unit) 30
- Standard Profit (per unit) 10
  (25% on Sales or 33-1/3% of Standard Cost)
- Budgeted Selling Price (per unit) 40

3. (a) Actual Output (units) for April, 2013

Fixed Overhead Volume Variance = Efficiency Variance + Capacity Variance
= ₹2,400 (F) + ₹4,000 (A)
= ₹1,600 (A)

Absorbed Overheads = (Standard Hours for Actual Output – Budgeted Hours) × Standard Fixed Overhead Rate per hour

⇒ (-) ₹ 1,600 = (2 hrs × Actual Output – 10,000 units × 2 hrs) × ₹ 2
⇒ Actual Output = 9,600 units

(b) Actual Fixed Overhead Expenses

Fixed Overhead Expenses Variance = Budgeted Fixed Overheads – Actual Fixed Overheads
⇒ ₹ 1,400 (F) = ₹40,000 – Actual Fixed Overheads
⇒ Actual Fixed Overheads = ₹38,600
4. (a) Actual Sales Quantity (units)

Sales Margin Volume Variance = \( \text{Budgeted Margin per unit} \times \left( \frac{\text{Actual Sales Quantity}}{\text{Budgeted Quantity}} - 1 \right) \)

\( \Rightarrow \text{₹ 4,000 (A)} = \text{₹ 10} \times (\text{Actual Sales Quantity} - 10,000 \text{ units}) \)

\( \Rightarrow \text{Actual Sales Quantity} = 9,600 \text{ units} \)

(b) Actual Selling Price (per unit)

Sales Price Variance = \( \left( \frac{\text{Actual Selling Price per unit}}{\text{Budgeted Selling Price per unit}} - 1 \right) \times \text{Actual Sales units} \)

\( \Rightarrow \text{₹ 9,600 (F)} = (\text{Actual Selling Price per unit} - \text{₹ 40}) \times 9,600 \text{ units} \)

\( \Rightarrow \text{Actual Selling Price per unit} = \text{₹ 41} \)

5. (a) Actual Quantity of Material Consumed

Material Usage Variance = \( \left( \frac{\text{Standard Quantity}}{\text{Actual Quantity}} - 1 \right) \times \text{Standard Price per unit} \)

\( \Rightarrow \text{₹ 6,400 (A)} = (9,600 \text{ units} \times 5 \text{ kg.} - \text{Actual Quantity}) \times \text{₹ 4} \)

\( \Rightarrow \text{Actual Quantity} = 49,600 \text{ Kg.} \)

(b) Actual Price per kg

Material Price Variance = \( (\text{Standard Price per kg.} - \text{Actual Price per kg.}) \times \text{Actual Quantity of Material Consumed} \)

\( \Rightarrow \text{4,960 (A)} = (\text{₹ 4} - \text{Actual Price per kg.}) \times 49,600 \text{ Kg.} \)

\( \Rightarrow \text{Actual Price per kg} = \text{₹ 4.10} \)

6. (a) Actual Direct Labour Hours Used

Labour Efficiency Variance = \( (\text{Standard Hours} - \text{Actual Hours}) \times \text{Standard Rate per hour} \)

\( \Rightarrow \text{₹ 3,600 (F)} = (9,600 \text{ units} \times 2 \text{ hrs} - \text{Actual Hours}) \times \text{₹ 3} \)

\( \Rightarrow \text{Actual Direct Labour Hours} = 18,000 \text{ hours} \)
(b) Actual Direct Labour Hour Rate

\[
\text{Labour Rate Variance} = \left( \frac{\text{Standard Rate per hour}}{\text{Actual Rate per hour}} \right) \times \text{Actual Direct Labour Hours}
\]

\[\Rightarrow \text{₹3,600 (A)}\]

\[= (₹3 \text{ per hour} - \text{Actual Rate per hour}) \times 18,000 \text{ hours}\]

\[\Rightarrow \text{Actual Direct Labour Hour Rate} = ₹3.20 \text{ per hour}\]

ANNUAL FINANCIAL PROFIT /LOSS STATEMENT
(FOR APRIL, 2013)

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Qty./ Hours</th>
<th>Rate/Price (₹)</th>
<th>Actual Value (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>(b)</td>
<td>(c)</td>
<td>(d)=(b)×(c)</td>
</tr>
<tr>
<td>Sales:</td>
<td>(A) 9,600 units</td>
<td>41</td>
<td>3,93,600</td>
</tr>
<tr>
<td>[Refer to working note 4]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Materials:</td>
<td>49,600 kgs.</td>
<td>4.10 per kg.</td>
<td>2,03,360</td>
</tr>
<tr>
<td>[Refer to working note 5]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Labour:</td>
<td>18,000 hours</td>
<td>3.20 per hour</td>
<td>57,600</td>
</tr>
<tr>
<td>[Refer to working note 6]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed Overheads:</td>
<td>18,000 hours</td>
<td>2.144.. per hour</td>
<td>38,600</td>
</tr>
<tr>
<td>[Refer to working note 6 (a) and 3 (b)]</td>
<td>[₹ 38,600/18,000 hours]</td>
<td>(absorbed on direct labour hour basis)</td>
<td></td>
</tr>
<tr>
<td>Total Costs:</td>
<td>(B)</td>
<td></td>
<td>2,99,560</td>
</tr>
<tr>
<td>Profit:</td>
<td>[(A) – (B)]</td>
<td></td>
<td>94,040</td>
</tr>
</tbody>
</table>

Problem-40

The following profit reconciliation statement has been prepared by the Cost Accountant of RSQ Ltd. for March, 2012:

<table>
<thead>
<tr>
<th></th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget Profit</td>
<td>2,40,000</td>
</tr>
<tr>
<td>Sales Price Variance</td>
<td>51,000 (F)</td>
</tr>
<tr>
<td>Sales Volume Profit Variance</td>
<td>42,000 (A)</td>
</tr>
</tbody>
</table>
Material Price Variance                              15,880 (A)  
Material Usage Variance                              3,200 (F)   
Labour Rate Variance                                 78,400 (F)  
Labour Efficiency Variance                           32,000 (A)  
Variable Overhead Expenditure Variance               8,000 (F)   
Variable Overhead Efficiency Variance                12,000 (A)  
Fixed Overhead Volume Variance                       1,96,000 (A) 
Fixed Overhead Expenditure Variance                  4,000 (F)   
Actual Profit                                       86,720      

Budgeted production and sales volumes for March, 2012 were equal and the level of finished goods stock was unchanged, but the stock of raw materials decreased by 6,400 kg (valued at standard price) during the month.

The standard cost card is as under:

<table>
<thead>
<tr>
<th></th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material 4 kg @ ₹ 2.00</td>
<td>8.00</td>
</tr>
<tr>
<td>Labour 4 hours @ ₹ 32.00</td>
<td>128.00</td>
</tr>
<tr>
<td>Variable Overhead 4 hours @ ₹ 12.00</td>
<td>48.00</td>
</tr>
<tr>
<td>Fixed Overheads 4 hours @ ₹ 28.00</td>
<td>112.00</td>
</tr>
<tr>
<td>Standard Cost</td>
<td>296.00</td>
</tr>
<tr>
<td>Standard Profit</td>
<td>24.00</td>
</tr>
<tr>
<td>Standard Selling Price</td>
<td>320.00</td>
</tr>
</tbody>
</table>

Required

(i) Calculate actual quantity of material purchased
(ii) Calculate actual production and sales volume
(iii) Calculate actual number of hours worked
(iv) Calculate actual variable and fixed overhead cost incurred.

Solution

COMPUTATION OF REQUIREMENTS

Actual Production & Sales Volume

Fixed Overhead Volume Variance = Standard Fixed Overhead Rate per Unit × (Actual Output – Budgeted Output*)
\[ \text{Actual Output} = 8,250 \text{ units} \]
\[ \text{*Budgeted Output} = \frac{\text{Budgeted Profit}}{\text{Budgeted Profit per unit}} \]
\[ = \frac{2,40,000}{24} \]
\[ = 10,000 \text{ units} \]

**Alternative**

Sales Margin Volume Variance = Standard Margin – Budgeted Margin
\[ = \text{Budgeted Margin} \times \text{Actual Qty.} – \text{Budgeted Margin} \times \text{Budgeted Qty.} \]
Or
\[ = \text{Budgeted Margin} \times (\text{Actual Qty.} – \text{Budgeted Qty.}) \]

\[ \text{Actual Qty.} = 8,250 \text{ units} \]

**Actual Quantity of Material Purchased**

Material Usage Variance = Standard Cost of Standard Quantity for Actual Output – Standard Cost of Actual Quantity
\[ = \text{Standard Qty.} \times \text{Standard Price} – \text{Actual Qty.} \times \text{Standard Price} \]
Or
\[ = \text{Standard Price} \times (\text{Standard Qty.} – \text{Actual Qty.}) \]

\[ \text{Actual Qty.} = 31,400 \text{ Kg.} \]

Actual Quantity Purchased = Actual Qty. Consumed – Decrease in Stock
\[ = 31,400 \text{ Kg.} – 6,400 \text{ Kg.} \]
\[ = 25,000 \text{ Kg.} \]

**Actual Hours Worked**

Labour Efficiency Variance = Standard Cost of Standard Time for Actual Output – Standard Cost for Actual Time
5.170 Advanced Management Accounting

\[
5.170 = \text{Standard Hours} \times \text{Standard Rate} - \text{Actual Hours} \times \text{Standard Rate}
\]

Or

\[
5.170 = \text{Standard Rate} \times (\text{Standard Hours} - \text{Actual Hours})
\]

⇒ ₹ 32,000 (A) = ₹ 32 \times (8,250 \text{ units} \times 4 \text{ Hrs.} - \text{Actual Hours})

⇒ Actual Hours = 34,000 Hrs.

Actual Fixed Overhead and Actual Variable Overhead Incurred

Variable Overhead Cost Variance = \text{Standard Variable Overheads for Production} - \text{Actual Variable Overheads}

Or

= (\text{Standard Variable Overhead Rate per unit} \times \text{Actual Production in Units}) - (\text{Actual Variable Overheads})

⇒ ₹ 8,000 (F) + ₹ 12,000 (A) = ₹ 48 \times 8,250 \text{ units} - \text{Actual Variable Overheads}

⇒ Actual Variable Overheads = ₹ 4,00,000

Fixed Overhead Cost Variance = \text{Absorbed Fixed Overheads} - \text{Actual Fixed Overheads}

Or

= (\text{Standard Fixed Overhead Rate per Unit} \times \text{Actual Production in units}) - (\text{Actual Fixed Overheads})

⇒ ₹ 4,000 (F) + ₹ 1,96,000 (A) = ₹ 112 \times 8,250 \text{ units} - \text{Actual Variable Overheads}

⇒ Actual Fixed Overheads = ₹11,16,000

Standard - Marginal Costing

Problem-41

A company following standard marginal costing system has the following interim trading statement for the quarter ending 30th June, 2013, which reveals a loss of ₹ 17,000, detailed below:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>4,99,200</td>
</tr>
<tr>
<td>Closing Stock (at prime cost)</td>
<td>18,000</td>
</tr>
</tbody>
</table>

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Standard Costing  5.171

Direct Material  1,68,000
Direct Labour  1,05,000
Variable Overhead  42,000
Fixed Overhead  1,20,000
Fixed Administration Overhead  40,000
Variable Distribution Overhead  19,200
Fixed Selling Overhead  40,000
Loss  17,000

Additional information is as follows:

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

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

Required

Analyse the above and report to the management giving the reasons for the loss.

Solution

WORKING NOTE

<table>
<thead>
<tr>
<th>Details</th>
<th>Working</th>
<th>Amount (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling Price</td>
<td>₹4,99,200</td>
<td>416</td>
</tr>
<tr>
<td>Raw Materials</td>
<td>₹1,68,000</td>
<td>120</td>
</tr>
<tr>
<td>Labour</td>
<td>₹1,05,000</td>
<td>60</td>
</tr>
<tr>
<td>*Equivalent units</td>
<td>₹1,750units*</td>
<td></td>
</tr>
<tr>
<td>Variable Overheads</td>
<td>₹42,000</td>
<td>30</td>
</tr>
<tr>
<td>Manufacturing Cost (Variable)</td>
<td>₹210</td>
<td></td>
</tr>
</tbody>
</table>
5.172 Advanced Management Accounting

<table>
<thead>
<tr>
<th>Distribution Overheads</th>
<th>₹19,200</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Variable Cost</td>
<td></td>
<td>226</td>
</tr>
<tr>
<td>Contribution</td>
<td></td>
<td>190</td>
</tr>
<tr>
<td>Fixed Cost</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory</td>
<td>₹1,20,000</td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td>₹40,000</td>
<td></td>
</tr>
<tr>
<td>Selling</td>
<td>₹40,000</td>
<td></td>
</tr>
</tbody>
</table>

**STANDARD PROFIT for 1,200 Units Sold**

<table>
<thead>
<tr>
<th>Details</th>
<th>Working</th>
<th>Amount (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribution</td>
<td>1,200 units × ₹190</td>
<td>2,28,000</td>
</tr>
<tr>
<td>Less: Fixed Costs</td>
<td></td>
<td>2,00,000</td>
</tr>
<tr>
<td>Profit</td>
<td></td>
<td>28,000</td>
</tr>
</tbody>
</table>

**RECONCILIATION BETWEEN BUDGETED AND ACTUAL PROFIT**

<table>
<thead>
<tr>
<th>Details</th>
<th>Working</th>
<th>Amount (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Profit</td>
<td>(2,000 units × ₹190 – ₹2,00,000)</td>
<td>1,80,000</td>
</tr>
<tr>
<td>Less: Volume variance</td>
<td>(800 units × ₹190)</td>
<td>1,52,000</td>
</tr>
<tr>
<td>Standard Profit</td>
<td></td>
<td>28,000</td>
</tr>
<tr>
<td>Factors causing loss:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Units Scrapped</td>
<td>(100 units × ₹210)</td>
<td>21,000</td>
</tr>
<tr>
<td>Labour Inefficiency</td>
<td>(350 units × ₹60)</td>
<td>21,000</td>
</tr>
<tr>
<td>Undervaluation of Closing Stock</td>
<td>(100 units × (₹210 – ₹180))</td>
<td>3,000</td>
</tr>
<tr>
<td>Actual Profit</td>
<td></td>
<td>(-)17,000</td>
</tr>
</tbody>
</table>

**Problem-42**

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

<table>
<thead>
<tr>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted profit</td>
</tr>
<tr>
<td>Less: Adverse variances:</td>
</tr>
<tr>
<td>Contribution price variance</td>
</tr>
</tbody>
</table>
Direct materials variance ................................. 1,000
Fixed overhead variance ................................. 600
Add: Favourable variances:
  Contribution quantity variance ....................... 1,800
  Direct wages variance ................................. 600
  Variable overhead variance ........................... 1,800
Actual profit ........................................... 7,000

There is no inventory. Production units equals to Sales units for both actual and budget.

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

Standard material cost per unit.............................. ₹ 1 (which is 5 kg. @ ₹ 20 Paise/kg.)
Material usage variance .................................. ₹ 400 (A)
Actual labour hours @ actual rate ......................... ₹ 63,000
Actual labour hours @ standard rate ..................... ₹ 61,950
Variable overhead standard rate ......................... ₹ 2
Standard hours of production ............................ 4 per unit
Variable overhead at standard rate ..................... ₹ 84,800
Variable overhead expenditure variance ................ ₹ 400 (A)
Budgeted fixed overhead .............................. ₹ 15,000

**Required**

Find out the following-

(i) Actual sales units
(ii) Actual sales rupees
(iii) Actual quantity of raw materials used
(iv) Labour efficiency variance
(v) Actual variable overhead in rupees
(vi) Variable overhead efficiency variance
(vii) Actual fixed overheads
(viii) Operating profit variance.
Solution

COMPUTATION OF REQUIREMENTS

Computation of Actual Sales (units)

Budgeted Contribution (रु15,000 + रु15,000)  
Add: Contribution Quantity Variance  रु1,800
Total Standard Contribution  रु31,800
Standard Contribution per unit  रु3
Actual Sales Volume (रु31,800 / रु3) 10,600 units

Computation of Actual Sales (रु) :
Actual Sales Value (10,600 units × रु17)  रु1,80,200

Computation of Actual Quantity of Raw Materials (used)

Standard Consumption (10,600 units × 5 kg.) 53,000 kgs.
Add: Material Usage Variance [400 (A) / रु0.20] 2,000 kgs.
Actual Consumption 55,000 kgs.

Computation of Labour Efficiency Variance

Standard Labour Cost for Standard Hours (रु63,000 + रु600)  रु63,600
Standard Labour Cost for Actual Hours  रु61,950
Labour Efficiency Variance  रु1,650 (F)

Computation of Actual Variable Overhead (रु)

Standard Variable Overheads for Output  रु84,800
Less: Variable Overhead Variance  रु1,800
Actual Variable Overhead  रु83,000

Computation of Variable Overhead Efficiency Variance

Workings
Actual Output 10,600 units
Standard Hours for Actual Output (10,600 units × 4 hrs.) 42,400 hours
Standard Labour Cost for Standard Hours  रु63,600
Standard Labour Rate per hour  
(₹ 63,600 / 42,400 hours)  
₹ 1.5

Actual Hours  
(₹61,950 / ₹1.5)  
41,300 hours

Variable Overhead Efficiency Variance  
[(42,400 hours - 41,300 hours) x ₹2]  
₹ 2,200 (F)

**Computation of Actual Fixed Overheads**

Actual Fixed Overheads  
(₹15,000 + ₹600)  
₹ 15,600

**Computation of Operating Profit Variance**

Operating Profit Variance:
If budgeted profit is considered  
(₹15,000 – ₹ 7,000)  
₹ 8,000 (A)
If standard profit is considered  
(₹16,800 – ₹ 7,000)  
₹ 9,800 (A)

**VERIFICATION**

<table>
<thead>
<tr>
<th></th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Sales</td>
<td>1,80,200</td>
</tr>
<tr>
<td>Less: Actual Cost</td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td>11,600</td>
</tr>
<tr>
<td>Labour</td>
<td>63,000</td>
</tr>
<tr>
<td>Variable Overhead</td>
<td>83,000</td>
</tr>
<tr>
<td>Fixed Overhead</td>
<td>15,600</td>
</tr>
<tr>
<td>Actual Net Profit</td>
<td>7,000</td>
</tr>
</tbody>
</table>

Sales Contribution Volume Variance = Sales Margin Volume Variance + Fixed Overhead Volume

Or

= Budgeted Margin per unit × (Actual Qty. – Budgeted Qty.) + Standard Fixed Overhead Rate per Unit × (Actual Output – Budgeted Output)

Or

= (Actual Qty. – Budgeted Qty.) × [Budgeted Margin per unit + Standard Fixed Overhead Rate per Unit]

Or

= (Actual Qty. – Budgeted Qty.) × [Standard Contribution per Unit]

Note: Production units equals to Sales units for both actual and budget.
Reconciliation between Budgeted Profit & Actual Profit-I

<table>
<thead>
<tr>
<th>Particulars</th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Profit</td>
<td>✓</td>
</tr>
<tr>
<td>Add / Less: Impact of Variances</td>
<td></td>
</tr>
<tr>
<td>Contribution Price Variance / Sales Price Variance / Sales Margin Price Variance</td>
<td>✓</td>
</tr>
<tr>
<td>Contribution Volume Variance</td>
<td>✓</td>
</tr>
<tr>
<td>Direct Material Cost Variance</td>
<td>✓</td>
</tr>
<tr>
<td>Direct Wages Cost Variance</td>
<td>✓</td>
</tr>
<tr>
<td>Fixed Overhead Expenditure Variance</td>
<td>✓</td>
</tr>
<tr>
<td>Variable Overheads Cost Variance</td>
<td>✓</td>
</tr>
<tr>
<td>Actual Profit</td>
<td>✓</td>
</tr>
</tbody>
</table>

Reconciliation between Budgeted Profit & Actual Profit-II

<table>
<thead>
<tr>
<th>Particulars</th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Profit</td>
<td>✓</td>
</tr>
<tr>
<td>Add/Less: Impact of Variances</td>
<td></td>
</tr>
<tr>
<td>Contribution Price Variance / Sales Price Variance / Sales Margin Price Variance</td>
<td>✓</td>
</tr>
<tr>
<td>Margin Volume Variance</td>
<td>✓</td>
</tr>
<tr>
<td>Direct Material Cost Variance</td>
<td>✓</td>
</tr>
<tr>
<td>Direct Wages Cost Variance</td>
<td>✓</td>
</tr>
<tr>
<td>Fixed Overhead Cost Variance</td>
<td>✓</td>
</tr>
<tr>
<td>Variable Overheads Cost Variance</td>
<td>✓</td>
</tr>
<tr>
<td>Actual Profit</td>
<td>✓</td>
</tr>
</tbody>
</table>

Problem-43

Young Chin Limited uses standard and marginal costing system. It provides the following details for the year 2012-13 relating to its production, cost and sales:

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Budget</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales units</td>
<td>24,000</td>
<td>25,600</td>
</tr>
<tr>
<td>Sales value (₹)</td>
<td>6,000</td>
<td>6,784</td>
</tr>
<tr>
<td>Materials (₹)</td>
<td>960</td>
<td>1,080</td>
</tr>
<tr>
<td>Labour (₹)</td>
<td>1,440</td>
<td>1,664</td>
</tr>
<tr>
<td>Variable overheads (₹)</td>
<td>2,400</td>
<td>2,592</td>
</tr>
</tbody>
</table>
The sales budget is based on the expectation of the company's estimate of market share of 12%. The entire industry's sales of the same product for the year 2012-13 is 2,40,000 units. Further details are as follows:

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Standard (In ₹)</th>
<th>Actual (In ₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material price per kg.</td>
<td>8.00</td>
<td>7.50</td>
</tr>
<tr>
<td>Labour rate per hour</td>
<td>6.00</td>
<td>6.40</td>
</tr>
</tbody>
</table>

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

Solution

COMPUTATION OF VARIANCES

Sales Variances - Turnover Based

**Workings**
- Budgeted Sales: ₹ 6,000
- Budgeted Sales Quantity (units): 24,000
- Budgeted Selling Price (₹ 6,000 / 24,000 units): ₹ 0.25
- Actual Industry Sales (units): 2,40,000
- Budgeted Market Share: 12%
- Market Share Required (units): (2,40,000 units × 12%) = 28,800

**Variances**

**Value Variance**
- = Actual Sales – Budgeted Sales
- = AP × AQ – BP × BQ
- = ₹ 6,784 – ₹6,000
- = ₹ 784 (F)

**Price Variance**
- = Actual Sales – Standard Sales
- = AP × AQ – BP × AQ
- Or
\[ \text{Volume Variance} = \text{Standard Sales – Budgeted Sales} \]
\[ = \text{BP} \times \text{AQ} – \text{BP} \times \text{BQ} \]
\[ = \text{BP} \times (\text{AQ} – \text{BQ}) \]
\[ = 25,600 \text{ units} \times \left( \frac{\text{¥}6,784 - \text{¥}6,000}{25,600 \text{ units} - 24,000 \text{ units}} \right) \]
\[ = \text{¥}384 \text{ (F)} \]

\[ \text{Market Size Variance} = (\text{Required Sales Quantity} \text{ in units} – \text{Total Budgeted Quantity} \text{ in units}) \times \text{Average Budgeted Price per unit} \]
\[ = (28,800 \text{ units} – 24,000 \text{ units}) \times \text{¥}0.25 \]
\[ = \text{¥}1,200 \text{ (F)} \]

\[ \text{Market Share Variance} = (\text{Total Actual Quantity} \text{ in units} – \text{Required Sales Quantity} \text{ in units}) \times \text{Average Budgeted Price per unit} \]
\[ = (25,600 \text{ units} – 28,800 \text{ units}) \times \text{¥}0.25 \]
\[ = \text{¥}800 \text{ (A)} \]

**Sales Variances - Contribution Based**

**Workings**

Budgeted Contribution:

<table>
<thead>
<tr>
<th>Sales</th>
<th>₹ 6,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less: Variable Costs</td>
<td>₹ 4,800</td>
</tr>
<tr>
<td>Contribution</td>
<td>₹ 1,200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Budgeted Units</th>
<th>24,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribution / unit (₹1,200 / 24,000 units)</td>
<td>₹ 0.05</td>
</tr>
</tbody>
</table>

**Variances**

**Sales Contribution Price Variance**

\[ = \text{Sales Price Variance} \]
\[ = 384 \text{ (F)} \]
Sales Contribution = Sales Volume Variance x Budgeted Profit Volume Ratio
Volume Variance
= 400 (F) × \( \frac{1,200}{6,000} \times 100 \)
= ₹ 80 (F)

Market Size Variance = (Required Sales Quantity in units – Total Budgeted Quantity in units) × Average Budgeted Contribution per unit
= (28,800 units – 24,000 units) × ₹ 0.05
= ₹ 240 (F)

Market Share Variance = (Total Actual Quantity in units – Required Sales Quantity in units) × Average Budgeted Contribution per unit
= (25,600 units – 28,800 units) × ₹ 0.05
= ₹ 160 (A)

Contribution Variance = Sales Contribution Price Variance + Sales Contribution Volume Variance
= ₹ 384 (F) + ₹ 80 (F)
= ₹ 464 (F)

Direct Materials Variance

Workings
Budgeted Material Cost ₹ 960
Budgeted Units 24,000
Budgeted Material Cost per 100 units (₹960 / 24,000 units × 100) ₹ 4
Standard Price of Material per Kg ₹ 8
Standard Requirement of Materials per 100 units of output (₹4 / ₹8) 0.50 Kg
Actual Output (units) 25,600
Standard Requirement for Actual Output ((25,600 units × 0.50 Kg / 100 units) 128 Kg
Actual Material Cost ₹ 1,080
Actual Price per Kg ₹ 7.50
Actual Quantity of Materials Consumed (₹1,080 / ₹7.50) 144 Kg

Variances
Material Price Variance = Standard Cost of Actual Quantity – Actual Cost
5.180 Advanced Management Accounting

Material Usage Variance

\[ \text{Material Usage Variance} = \text{Standard Cost of Standard Quantity for Actual Production} - \text{Standard Cost of Actual Quantity} \]

\[ = \text{Std. Price} \times (\text{Std. Qty.} - \text{Actual Qty.}) \]

\[ = \text{Rs.} 8 \times (128 \text{ Kg.} - 144 \text{ Kg.}) \]

\[ = \text{Rs.} 128 \text{ (A)} \]

Direct Labour Variances

**Workings**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Labour Cost</td>
<td>Rs. 1,440</td>
</tr>
<tr>
<td>Budgeted Units</td>
<td>24,000</td>
</tr>
<tr>
<td>Budgeted Labour Cost per 100 units</td>
<td>Rs. 6</td>
</tr>
<tr>
<td>Standard Labour Rate per hour</td>
<td>Rs. 6</td>
</tr>
<tr>
<td>Standard Requirement of Labour Hours per 100 units output</td>
<td>1 hr</td>
</tr>
<tr>
<td>Actual Output (units)</td>
<td>25,600</td>
</tr>
<tr>
<td>Standard Hours Required for Actual Output (25,600 units x 1 hr / 100 units)</td>
<td>256 hrs</td>
</tr>
<tr>
<td>Actual Labour Cost</td>
<td>Rs. 1,664</td>
</tr>
<tr>
<td>Actual Direct Labour Rate per hour</td>
<td>Rs. 6.40</td>
</tr>
<tr>
<td>Actual Hours Worked (Rs. 1,664 / Rs. 6.40)</td>
<td>260 hrs</td>
</tr>
<tr>
<td>Budgeted Direct Labour Hours (Rs. 1,440 / Rs. 6)</td>
<td>240 hrs</td>
</tr>
</tbody>
</table>

**Variances**

Labour Rate Variance

\[ \text{Labour Rate Variance} = \text{Standard Cost of Actual Time} - \text{Actual Cost} \]

\[ = \text{Actual Hours} \times (\text{Std. Rate} - \text{Actual Rate}) \]

\[ = 260 \text{ hours} \times (\text{Rs.} \ 6.00 - \text{Rs.} \ 6.40) \]

\[ = \text{Rs.} 104 \text{ (A)} \]
Labour Efficiency Variance

= Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time

Or

= Std. Rate × (Std. Hours – Actual Hours)

= ₹ 6 × (256 hours – 260 hours)

= ₹ 24 (A)

Variable Overheads Variances

Workings

Budgeted Variable Overheads

= ₹ 2,400

Budgeted Labour Hours

= 240 hours

Standard Variable Overhead Rate per direct labour hour (₹ 2,400 / ₹ 240)

= ₹ 10

Actual Hours

= 260 hours

Standard Hours Required for Actual Output

= 256 hours

Variances

Expenditure Variance

= Budgeted Variable Overheads for Actual Hours – Actual Variable Overheads

= 260 hours × ₹ 10 – ₹ 2,592

= ₹ 8 (F)

Efficiency Variances

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

= 256 hours × ₹ 10 – 260 hours × ₹ 10

= 40 (A)

CONTRIBUTION ANALYSIS

<table>
<thead>
<tr>
<th></th>
<th>Budget</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>₹ 6,000</td>
<td>₹ 6,784</td>
</tr>
<tr>
<td>Variable Cost</td>
<td>₹ 4,800</td>
<td>₹ 5,336</td>
</tr>
<tr>
<td>Contribution</td>
<td>₹ 1,200</td>
<td>₹ 1,448</td>
</tr>
</tbody>
</table>
RECONCILIATION

Budgeted and Actual Contribution

<table>
<thead>
<tr>
<th></th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Contribution</td>
<td>1,200</td>
</tr>
<tr>
<td>Add: Sales Contribution Volume Variance</td>
<td>80 (F)</td>
</tr>
<tr>
<td>Standard Contribution</td>
<td>1,280</td>
</tr>
<tr>
<td>Add: Sales Price Variance</td>
<td>384 (F)</td>
</tr>
<tr>
<td>Less: Material Usage Variance</td>
<td>128 (A)</td>
</tr>
<tr>
<td>Add: Material Price Variance</td>
<td>72 (F)</td>
</tr>
<tr>
<td>Less: Labour Efficiency Variance</td>
<td>24 (A)</td>
</tr>
<tr>
<td>Less: Labour Rate Variance</td>
<td>104 (A)</td>
</tr>
<tr>
<td>Less: Variable Overhead Efficiency Variance</td>
<td>40 (A)</td>
</tr>
<tr>
<td>Add: Variable Overhead Expense Variance</td>
<td>8 (F)</td>
</tr>
<tr>
<td>Actual Contribution</td>
<td>1,448</td>
</tr>
</tbody>
</table>

Single Plan/Partial Plan

Problem-44

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

(i) Material price variance (on purchase of materials)
(ii) Material usage variance (on consumption)
(iii) Labour rate variance.

Solution

JOURNAL ENTRIES IN SINGLE PLAN

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Journal Entries</th>
<th>Debit Amount (₹)</th>
<th>Credit Amount (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>Dr. Material Control A/c</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dr. or Cr. Material Price Variance A/c</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cr. Creditors A/c</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
Incomplete Ledger, Computation of Variances

Problem-45

Transparent Ltd. manufactures paint. It uses a standard costing system and the variances are reported to the management on fortnightly basis. A fire destroyed some important records of the company. You have been able to collect the following information from the spoilt papers/records and as a result of consultation with accounting personnel in respect of a fortnight:

(a) The paint requires two types of raw material RM\(_1\) and RM\(_2\). The standard quantity of RM\(_2\) in final product is 5 litres and standard cost thereof is ₹36 per litre.

(b) The company purchased 200 Kg. of RM\(_1\) and 550 litres of RM\(_2\) during that fortnight.

(c) The standard wage rate is ₹24 per labour hour. Actual labour hours were 460 during the fortnight.

(d) Variances as disclosed from some spilled paper are:

(i) Price Variance (RM\(_2\)) -- ₹1,320 (A)

(ii) Usage Variance (RM\(_1\)) -- ₹240 (F)

(iii) Labour Efficiency Variance -- ₹1,440 (A)

(e) Some incomplete ledger entries for that fortnight reveal
Required

Compute the meaningful variances to be presented before management. (Key computations should form part of the answer).

Solution

COMPUTATION OF KEY INFORMATION

1. Actual Output of Paint

\[
\text{Actual Output of Paint} = \frac{\text{Total Standard Cost of RM}_2 \text{in Final Product}}{\text{Standard Cost of RM}_2 \text{in One Unit of Final Product}}
\]

\[
= \frac{₹14,400}{₹180}\]

\[
= 80 \text{ units of Paint}
\]

* Standard Cost of RM$_2$ in One Unit of Final Product

\[
= 5 \text{ litres} \times ₹36
\]

\[
= ₹180
\]
2. Actual Cost per litre of RM$_2$

Purchase Price Variance (RM$_2$)

\[
= \text{Standard Cost of Actual Quantity} - \text{Actual Cost}
\]
\[
= \text{Purchase Quantity} \times (\text{Standard Price} - \text{Actual Price})
\]
\[
1,320 (A) = 550 \text{ litres} \times (36 - \text{Actual Price})
\]
\[
\Rightarrow -1,320 = 550 \times (36 - \text{Actual Price})
\]
\[
\Rightarrow \text{Actual Price} = \text{₹}38.40 \text{ per litre}
\]

3. Actual Quantity of RM$_2$ Utilised

Total Quantity of RM$_2$ Purchased 550 litres
Add: Opening Balance (₹3,600/₹36) 100 litres
Less: Closing Balance (₹8,280/₹36) 230 litres

420 litres

4. Standard Quantity of RM$_2$ for Actual Output

\[
= \frac{\text{Standard Cost of RM$_2$ issued to production}}{\text{Standard Cost of RM$_2$ per litre}}
\]
\[
= \frac{14,400}{36}
\]
\[
= 400 \text{ litres}
\]

5. Standard Cost per Kg. of RM$_1$

Standard Quantity of RM$_1$, ₹ 3,600
Issued to Production at Standard Cost 3,600
Balance at Standard Cost 1,200
Total 4,800

The above total is equal to total purchase or total standard cost of 200 kg.

\[
\text{Standard Cost per Kg. of RM$_1$} = \frac{\text{Total Standard Cost of 200 Kg.}}{200 \text{Kg.}}
\]
\[
= \frac{4,800}{200 \text{Kg.}}
\]
\[
= \text{₹}24
\]
6. **Actual Quantity of RM₁ issued to production**

\[
\text{Actual Quantity of RM₁} = \frac{¥3,600}{¥24} = 150 \text{ Kg.}
\]

7. **Standard Quantity of RM₁ for actual output**

Material Usage Variance = Standard Price \times (Standard Quantity – Actual Quantity)

\[
¥240 (F) = ¥24 \times (\text{Standard Quantity} – 150 \text{ Kg.})
\]

\[
\text{Std. Quantity} = 160 \text{ Kg.}
\]

8. **Actual Cost per Kg of RM₁**

\[
\begin{align*}
\text{Actual Cost per Kg of RM₁} &= \frac{¥4,320}{200\text{Kg.}} \\
&= ¥21.60
\end{align*}
\]

9. **Standard and Actual Cost of Material**

<table>
<thead>
<tr>
<th>Raw Material</th>
<th>Standard</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Qty. [SQ]</td>
<td>Price [SP] (₹)</td>
</tr>
<tr>
<td>RM₁</td>
<td>160Kg.</td>
<td>24</td>
</tr>
<tr>
<td>RM₂</td>
<td>400lt.</td>
<td>36</td>
</tr>
</tbody>
</table>

10. **Actual Wage Rate per hour**

\[
\text{Actual Wage Rate per hour} = \frac{\text{Wages Paid & Outstanding}}{\text{Actual Labour Hours}}
\]

\[
\frac{¥10,350}{460\text{Hrs.}} = ¥22.50
\]
11. **Standard Labour Hours for actual output**

Labour Efficiency Variance = Std. Wage Rate \times (Std. Hours – Actual Hours)

\[ 1,440 \text{ (A)} = \text{₹}24 \times (\text{Std. Hours} – 460 \text{ Hours}) \]

\[ \text{Std. Hours} = 400 \text{ Hours} \]

12. **Standard & Actual Cost of Labour**

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours</td>
<td>Wage Rate per hour (₹)</td>
<td>Amount (₹)</td>
</tr>
<tr>
<td>400</td>
<td>24</td>
<td>9,600</td>
</tr>
</tbody>
</table>

**COMPUTATION OF VARIANCES**

- **Material Cost Variance**
  \[ = \text{Std. Cost} – \text{Actual Cost} \]
  \[ = \text{₹}18,240 – \text{₹}19,368 \]
  \[ = \text{₹}1,128 \text{ (A)} \]

- **Material Price Variance RM}_1\]
  \[ = \text{Actual Quantity} \times (\text{Std. Price} – \text{Actual Price}) \]
  \[ = 150 \text{ Kg} \times (\text{₹}24 – \text{₹}21.60) \]
  \[ = \text{₹}360 \text{ (F)} \]

- **Material Price Variance RM}_2\]
  \[ = 420 \text{ litres} \times (\text{₹}36 – \text{₹}38.40) \]
  \[ = 1,008 \text{ (A)} \]

- **Material Usage VarianceRM}_2\]
  \[ = \text{Std. Price} \times (\text{Std. Quantity} – \text{Actual Quantity}) \]
  \[ = \text{₹}36 \times (400 \text{ litres} – 420 \text{ litres}) \]
  \[ = \text{₹}720 \text{ (A)} \]

- **Labour Cost Variance**
  \[ = \text{Standard Cost} – \text{Actual Cost} \]
  \[ = \text{₹}9,600 – \text{₹}10,350 \]
  \[ = \text{₹}750 \text{ (A)} \]

- **Labour Rate Variance**
  \[ = \text{Actual Hours} \times (\text{Std. Rate} – \text{Actual Rate}) \]
  \[ = 460 \text{ Hours} \times (\text{₹}24 – \text{₹}22.50) \]
  \[ = \text{₹}690 \text{ (F)} \]

**Verification**

- **Material Cost Variance**
  \[ = \text{Material Price Variance RM}_1 + \text{Material Usage VarianceRM}_2 \]
  \[ = \text{₹}360 \text{ (F)} + \text{₹}240 \text{ (F)} + \text{₹}1,008 \text{ (A)} + \text{₹}720 \text{ (A)} \]
  \[ = \text{₹}1,128 \text{ (A)} \]
Labour Cost Variance

\[ \text{Labour Cost Variance} = \text{Labour Rate Variance} + \text{Labour Efficiency Variance} \]

\[ = \, ₹\, 690 \, (F) + \, ₹\, 1,440 \, (A) \]

\[ = \, ₹\, 750 \, (A) \]

**Planning & Operational Variances, Controllable and Non Controllable Variances**

**Problem-46**

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

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

The standard cost data for a batch of raspberry jam are-

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity (Kgs)</th>
<th>Cost Rate (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits extract</td>
<td>400</td>
<td>16 per kg</td>
</tr>
<tr>
<td>Glucose syrup</td>
<td>700</td>
<td>10 per kg</td>
</tr>
<tr>
<td>Pectin</td>
<td>99</td>
<td>33.2 per kg</td>
</tr>
<tr>
<td>Citric acid</td>
<td>1</td>
<td>200 per kg</td>
</tr>
<tr>
<td>Labour</td>
<td>18 hours</td>
<td>32.50 per hour</td>
</tr>
</tbody>
</table>

Standard processing loss 3%

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

The retail results for the batch were –

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity (Kgs)</th>
<th>Cost Rate (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit extract</td>
<td>428</td>
<td>18 per kg</td>
</tr>
<tr>
<td>Glucose syrup</td>
<td>742</td>
<td>12 per kg</td>
</tr>
<tr>
<td>Pectin</td>
<td>125</td>
<td>32.8 per kg</td>
</tr>
<tr>
<td>Citric acid</td>
<td>1</td>
<td>95 per kg</td>
</tr>
<tr>
<td>Labour</td>
<td>20 hrs.</td>
<td>30 per hour</td>
</tr>
</tbody>
</table>

Actual output was 1,164 kgs of raspberry jam.

**Required**

(i) Calculate the ingredients planning variances that are deemed uncontrollable.
(ii) Calculate the ingredients operating variances that are deemed controllable.
(iii) Calculate the mixture and yield variances.
(iv) Calculate the total variances for the batch.

Solution

BASIC WORKINGS

Statement Showing “Original Standard, Revised Standard and Actual Data”

<table>
<thead>
<tr>
<th>Ingre.</th>
<th>Original Standards</th>
<th>Revised Standards</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit</td>
<td>400 Kgs × ₹16.00</td>
<td>400 Kgs × ₹19.00</td>
<td>428 Kgs × ₹18.00</td>
</tr>
<tr>
<td>Glucose</td>
<td>700 Kgs × ₹10.00</td>
<td>700 Kgs × ₹12.00</td>
<td>742 Kgs × ₹12.00</td>
</tr>
<tr>
<td>Pectin</td>
<td>99 Kgs × ₹33.20</td>
<td>99 Kgs × ₹33.20</td>
<td>125 Kgs × ₹32.80</td>
</tr>
<tr>
<td>Citric acid</td>
<td>1 Kg × ₹200.00</td>
<td>1 Kg × ₹200.00</td>
<td>1 Kg × ₹95.00</td>
</tr>
<tr>
<td>Total</td>
<td>₹16,886.80</td>
<td>₹19,486.80</td>
<td>₹20,803.00</td>
</tr>
<tr>
<td>Labour</td>
<td>₹585.00</td>
<td>₹585.00</td>
<td>₹600.00</td>
</tr>
<tr>
<td>Input</td>
<td>₹17,471.80</td>
<td>₹20,071.80</td>
<td>₹21,403.00</td>
</tr>
<tr>
<td>Loss</td>
<td>36 Kgs</td>
<td>36 Kgs</td>
<td>132 Kgs</td>
</tr>
<tr>
<td>Output</td>
<td>₹17,471.80</td>
<td>₹20,071.80</td>
<td>₹21,403.00</td>
</tr>
</tbody>
</table>

COMPUTATION OF VARIANCES

(i) Planning Variances

Fruit extract (₹ 6,400.00 less ₹ 7,600.00) = ₹ 1,200.00 (A)
Glucose syrup (₹ 7,000.00 less ₹ 8,400.00) = ₹ 1,400.00 (A)
Total ₹ 2,600.00 (A)

* (Std. Qty. × Std Price. less Std. Qty. × Revised Std. Price)

(ii) Ingredients Operating Variances

Total (₹ 19,486.80 less ₹ 20,803.00) = ₹ 1,316.20 (A)

Ingredients Price Variance:

(Revised Material Price less Actual Material Price) × (Actual Qty. Consumed)

Fruit extract (₹ 19.00 – ₹ 18.00) × 428.00 Kgs = 428.00 (F)
Glucose syrup \( (¥ 12.00 – ¥ 12.00) \times 742.00 \text{Kgs} \) \( \text{Nil} \)

Pectin \( (¥ 33.20 – ¥ 32.80) \times 125.00 \text{Kgs} \) \( 50.00 \) (F)

Citric acid \( (¥ 200.00 – ¥ 95.00) \times 1.00 \text{Kg} \) \( 105.00 \) (F)

\[ 583.00 \) (F)

Ingredients Usage Variance:

\((\text{Std. Qty. on Actual Production less Actual Qty on Actual Production}) \times \text{Revised Std. Price}\)

\begin{align*}
\text{Fruit extract} & \quad (400.00 \text{Kgs.}– 428.00 \text{Kgs.}) \times ¥ 19.00 \quad 532.00 \) (A)
\text{Glucose syrup} & \quad (700.00 \text{Kgs.}– 742.00 \text{Kgs.}) \times ¥ 12.00 \quad 504.00 \) (A)
\text{Pectin} & \quad (99.00 \text{Kgs.} – 125.00 \text{Kgs.}) \times ¥ 33.20 \quad 863.20 \) (A)
\text{Citric acid} & \quad (1.00 \text{Kg.} – 1.00 \text{Kg.}) \times ¥ 200.00 \quad \text{Nil}
\end{align*}

1,899.20 \) (A)

Labour Operating Variance:

\((\text{Standard Cost – Actual Cost})\)

\(¥ 585 – ¥ 600 = ¥ 15 \) (A)

(iii) Mix Variance

\((\text{Actual Usage in Std. Mix less Actual Usage in Actual Mix}) \times \text{Revised Std. Price}\)

\begin{align*}
\text{Fruit extract} & \quad (432.00 \text{Kgs.} – 428.00 \text{Kgs.}) \times ¥ 19.00 \quad 76.00 \) (F)
\text{Glucose syrup} & \quad (756.00 \text{Kgs.} – 742.00 \text{Kgs.}) \times ¥ 12.00 \quad 168.00 \) (F)
\text{Pectin} & \quad (106.92 \text{Kgs.} – 125.00 \text{Kgs.}) \times ¥ 33.20 \quad 600.30 \) (A)
\text{Citric acid} & \quad (1.08 \text{Kgs.} – 1.00 \text{Kg.}) \times ¥ 200.00 \quad 16.00 \) (F)
\end{align*}

340.30 \) (A)

Yield Variance:

\((\text{Actual Yield – Std. Yield from Actual Input}) \times \text{Std. Cost per unit of Output}\)

\[= (1,164 \text{Kgs.} – 1,296 \text{Kgs.} \times 0.97) \times \frac{¥ 19,486.80}{1,164 \text{Kgs.}}\]

\[= 1,558.90 \) (A)\]
(iv) Total Variance
Planning Variance + Usage Variance + Price Variance + Labour Operating Variance
2,600.00 (A) + 1,899.20 (A) + 583.00 (F) + 15.00 (A) = 3,931.20 (A)

Problem-47
Managing Director of Petro-KL Ltd (PTKLL) thinks that Standard Costing has little to offer in the reporting of material variances due to frequently change in price of materials.

PTKLL can utilize one of two equally suitable raw materials and always plan to utilize the raw material which will lead to cheapest total production costs. However PTKLL is frequently trapped by price changes and the material actually used often provides, after the event, to have been more expensive than the alternative which was originally rejected.

During last accounting period, to produce a unit of ‘P’ PTKLL could use either 2.50 Kg of ‘PG’ or 2.50 kg of ‘PD’. PTKLL planned to use ‘PG’ as it appeared it would be cheaper of the two and plans were based on a cost of ‘PG’ of ₹ 1.50 per Kg. Due to market movements the actual prices changed and if PTKLL had purchased efficiently the cost would have been:

‘PG’ ₹ 2.25 per Kg;
‘PD’ ₹ 2.00 per Kg

Production of ‘P’ was 1,000 units and usage of ‘PG’ amounted to 2,700 Kg at a total cost of ₹ 6,480/-

Required
Analyze the material variance for ‘P’ by:
(i) Traditional Variance Analysis; and
(ii) An approach which distinguishes between Planning and Operational Variances.

Solution
COMPUTATION OF VARIANCES
Traditional Variance (Actual Vs Original Budget)
Usage Variance = (Standard Quantity – Actual Quantity) × Standard Price
= (2,500 Kg – 2,700 Kg) × ₹ 1.50
= ₹ 300 (A)

Price Variance = (Standard Price – Actual Price) × Actual Quantity
= (₹ 1.50 – ₹ 2.40) × 2,700 Kg
Total Variance  =  ₹ 2,430 (A) + ₹ 300 (A) = ₹ 2,730 (A)

Usage Variance  =  (2,500 Kg – 2,700 Kg) × ₹ 2.25
=  ₹ 450 (A)

Price Variance  =  (₹ 2.25 – ₹ 2.40) × 2,700 Kg
=  ₹ 405 (A)

Total Variance  =  ₹ 450 (A) + ₹ 405 (A) = ₹ 855 (A)

Planning Variance (Revised Vs Original Budget)
Controllable Variance  =  (₹ 2.00 – ₹ 2.25) × 2,500 Kg
=  625 (A)

Uncontrollable Variance  =  (₹ 1.50 – ₹ 2.00) × 2,500 Kg
=  1,250 (A)

Total Variance  =  ₹ 625 (A) + ₹ 1,250 (A) = ₹ 1,875 (A)

Traditional Variance  =  Operational Variance + Planning Variance
=  855 (A) + 1,875 (A) = 2,730 (A)

A Planning Variance simply compares a revised standard to the original standard. An Operational Variance simply compares the actual results against the revised amount. Controllable Variances are those variances which arises due to inefficiency of a cost centre /department. Uncontrollable Variances are those variances which arises due to factors beyond the control of the management or concerned department of the organization.

Problem-48
Osaka Manufacturing Co. (OMC) is a leading consumer goods company. The budgeted and actual data of OMC for the year 2013-14 are as follows:

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Budget</th>
<th>Actual</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales / Production (units)</td>
<td>2,00,000</td>
<td>1,65,000</td>
<td>(35,000)</td>
</tr>
<tr>
<td>Sales (₹)</td>
<td>21,00,000</td>
<td>16,92,900</td>
<td>(4,07,100)</td>
</tr>
<tr>
<td>Less: Variable Costs (₹)</td>
<td>12,66,000</td>
<td>10,74,150</td>
<td>1,91,850</td>
</tr>
<tr>
<td>Less: Fixed Costs (₹)</td>
<td>3,15,000</td>
<td>3,30,000</td>
<td>(15,000)</td>
</tr>
<tr>
<td>Profit</td>
<td>5,19,000</td>
<td>2,88,750</td>
<td>(2,30,250)</td>
</tr>
</tbody>
</table>
The budgeted data shown in the table is based on the assumption that total market size would be 4,00,000 units but it turned out to be 3,75,000 units.

**Required**

Prepare a statement showing reconciliation of budget profit to actual profit through marginal costing approach for the year 2013-14 in as much detail as possible.

**Solution**

### STATEMENT OF RECONCILIATION - BUDGETED VS ACTUAL PROFIT

<table>
<thead>
<tr>
<th>Particulars</th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Profit</td>
<td>5,19,000</td>
</tr>
<tr>
<td>Less: Sales Volume Contribution Planning Variance (Adverse)</td>
<td>52,125</td>
</tr>
<tr>
<td>Less: Sales Volume Contribution Operational Variance (Adverse)</td>
<td>93,825</td>
</tr>
<tr>
<td>Less: Sales Price Variance (Adverse)</td>
<td>39,600</td>
</tr>
<tr>
<td>Less: Variable Cost Variance (Adverse)</td>
<td>29,700</td>
</tr>
<tr>
<td>Less: Fixed Cost Variance (Adverse)</td>
<td>15,000</td>
</tr>
<tr>
<td>Actual Profit</td>
<td>2,88,750</td>
</tr>
</tbody>
</table>

### WORKINGS

**Basic Workings**

- **Budgeted Market Share (in %)** = \( \frac{2,00,000\text{units}}{4,00,000\text{units}} = 50\% \)
- **Actual Market Share (in %)** = \( \frac{1,65,000\text{units}}{3,75,000\text{units}} = 44\% \)
- **Budgeted Contribution** = \( \text{₹}21,00,000 - \text{₹}12,66,000 = \text{₹}8,34,000 \)
- **Average Budgeted Contribution (per unit)** = \( \frac{\text{₹}8,34,000}{\text{₹}2,00,000} = \text{₹}4.17 \)
- **Budgeted Sales Price per unit** = \( \frac{\text{₹}21,00,000}{\text{₹}2,00,000} = \text{₹}10.50 \)
- **Actual Sales Price per unit** = \( \frac{\text{₹}16,92,900}{\text{₹}1,65,000} = \text{₹}10.26 \)
5.194 Advanced Management Accounting

Standard Variable Cost per unit = \frac{₹12,66,000}{₹2,00,000} = ₹6.33

Actual Variable Cost per unit = \frac{₹10,74,150}{₹1,65,000} = ₹6.51

CALCULATION OF VARIANCES

Sales Variances:………

Volume Contribution Planning* = Budgeted Market Share % × (Actual Industry Sales Quantity in units – Budgeted Industry Sales Quantity in units) × (Average Budgeted Contribution per unit)

= 50% × (3,75,000 units – 4,00,000 units) × ₹4.17

= 52,125 (A)

(*) Market Size Variance

Volume Contribution Operational** = (Actual Market Share % – Budgeted Market Share %) × (Actual Industry Sales Quantity in units) × (Average Budgeted Contribution per unit)

= (44% – 50 %) × 3,75,000 units × ₹4.17

= 93,825 (A)

(**) Market Share Variance

Price = Actual Sales – Standard Sales

= Actual Sales Quantity × (Actual Price – Budgeted Price)

= 1,65,000 units × (₹10.26 – ₹10.50) = 39,600 (A)

Variable Cost Variances:………..

Cost = Standard Cost for Production – Actual Cost

= Actual Production × (Standard Cost per unit – Actual Cost per unit)

= 1,65,000 units × (₹6.33 – ₹6.51) = ₹29,700(A)

Fixed Cost Variances:………..

Expenditure = Budgeted Fixed Cost – Actual Fixed Cost

= ₹3,15,000 – ₹3,30,000 = ₹15,000 (A)
Fixed Overhead Volume Variance does not arise in a Marginal Costing system

Variance Analysis in Activity Based Costing

Problem-49

N & S Co. (NSC) is a multiple product manufacturer. NSC produces the unit and all overheads are associated with the delivery of units to its customers.

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Budget</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overheads (₹)</td>
<td>4,000</td>
<td>3,900</td>
</tr>
<tr>
<td>Output (units)</td>
<td>2,000</td>
<td>2,100</td>
</tr>
<tr>
<td>Customer Deliveries (no.’s)</td>
<td>20</td>
<td>19</td>
</tr>
</tbody>
</table>

**Required**

Calculate Efficiency Variance and Expenditure Variance by adopting ABC approach.

**Solution**

**Computation of Variances**

**Efficiency Variance**

\[ \text{Efficiency Variance} = \text{Cost Impact of undertaking activities more/ less than standard} \]

\[ = (21 \text{ deliveries} - 19 \text{ deliveries}) \times 200 \]

\[ = 400 \text{ F} \]

\[ (*) \left( \frac{20 \text{ Deliveries}}{2,000 \text{ units}} \right) \times 2,100 \text{ units} \]

**Expenditure Variance**

\[ \text{Expenditure Variance} = \text{Cost impact of paying more/ less than standard for actual activities undertaken} \]

\[ = 19 \text{ deliveries} \times 200 - 3,900 \]

\[ = 100 \text{ (A)} \]
Interpretation of Variances

Problem-1

Natural Spices manufactures and distributes high-quality spices to gourmet food shops and top quality restaurants. Gourmet and high-end restaurants pride themselves on using the freshest, highest-quality ingredients.

Natural Spices has set up five state of the art plants for meeting the ever growing demand. The firm procures raw material directly from the centers of produce to maintain uniform taste and quality. The raw material is first cleaned, dried and tested with the help of special machines. It is then carefully grounded into the finished product passing through various stages and packaged at the firm’s ultraclean factory before being dispatched to customers.

The following variances pertain to last week of operations, arose as a consequence of management’s decision to lower prices to increase volume.

<table>
<thead>
<tr>
<th>Variance</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Volume Variance</td>
<td>18,000 (F)</td>
</tr>
<tr>
<td>Sales Price Variance</td>
<td>14,000 (A)</td>
</tr>
<tr>
<td>Purchase Price Variance</td>
<td>10,000 (F)</td>
</tr>
<tr>
<td>Labour Efficiency Variance</td>
<td>11,200 (F)</td>
</tr>
<tr>
<td>Fixed Cost Expenditure Variance</td>
<td>4,400 (F)</td>
</tr>
</tbody>
</table>

Required

(i) Identify the ‘Critical Success Factors’ for Natural Spices.

(ii) Evaluate the management’s decision with the ‘Overall Corporate Strategy’ and ‘Critical Success Factors’.

Solution

(i) Gourmet and high-end restaurants recognise Natural Spices on the basis of its high quality of spices. Therefore, quality is most critical success factor of Natural Spices. There are other factors which cannot be ignore such as price, delivery options, attractive packing etc. But all are secondary to the quality.

(ii) Deliberate action of cutting price to increase sales volume indicates that firm is intending to expand its market to retail market and street shops which is price sensitive.
Purchase Price Variance is clearly indicating that firm has purchased raw material at lower price which may be due to buying of lower quality of material. Similarly positive Efficiency Variance is indicating cost cutting and stretching resources.

It appears that firm is intending to expand its market to retail market and street shops by not only reducing the price but also compromising its quality which is opposing its current strategy of high quality.

Management should monitor the trends of variances on regular basis and take appropriate action in case of evidence of permanent decline in quality. Here, customer feedback is also very important.

Problem-2
State possible Impact on Variances in each of the following independent situations:
(i) More units were produced than was budgeted.
(ii) Careless handling of materials by production personnel
(iii) The purchase of inferior quality material
(iv) New competition entered the market.
(v) New suppliers were used.
(vi) New production staff were recruited.
(vii) Market share has fallen from 20% to 18%

Solution
Impact on Variances

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Independent Situations</th>
<th>Impact on Variances</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>More units were produced than was budgeted.</td>
<td>Favourable Fixed Overhead Volume</td>
</tr>
<tr>
<td>(ii)</td>
<td>Careless handling of materials by production personnel</td>
<td>Adverse Material Usage</td>
</tr>
<tr>
<td>(iii)</td>
<td>The purchase of inferior quality material</td>
<td>Adverse Material Usage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Favourable Material Price</td>
</tr>
<tr>
<td>(iv)</td>
<td>New competition entered the market.</td>
<td>Adverse Sales Price</td>
</tr>
<tr>
<td>(v)</td>
<td>New suppliers were used.</td>
<td>Adverse Material Price</td>
</tr>
<tr>
<td>(vi)</td>
<td>New production staff were recruited.</td>
<td>Adverse Labour Efficiency</td>
</tr>
<tr>
<td>(vii)</td>
<td>Market share has fallen from 20% to 18%</td>
<td>Adverse Market Share Variance</td>
</tr>
</tbody>
</table>