STUDY NOTES FOR COST ACCOUNTING

BY

ATAUSH SHAIFI

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# CIMA OFFICIAL TERMINOLOGY

<table>
<thead>
<tr>
<th>Terms</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost accounting</strong></td>
<td>Gathering of cost information and its attachment to cost objects, the establishment of budgets, standard costs and actual costs of operations, processes, activities or products; and the analysis of variances, profitability or the social use of funds.</td>
</tr>
<tr>
<td><strong>Cost object</strong></td>
<td>A product, service, centre, activity, customer or distribution channel in relation to which costs are ascertained.</td>
</tr>
<tr>
<td><strong>Cost unit</strong></td>
<td>Unit of product or service in relation to which costs are ascertained.</td>
</tr>
<tr>
<td></td>
<td>As a noun, <strong>cost</strong> is ‘The amount of cash or cash equivalent paid ....'</td>
</tr>
<tr>
<td></td>
<td>As a verb, cost is ‘To ascertain the cost of a specified thing or activity.</td>
</tr>
<tr>
<td></td>
<td>The word cost can rarely stand alone and should be qualified as to its nature and limitations.</td>
</tr>
</tbody>
</table>

**Industry sector** | **Cost unit**  
Brick-making | 1,000 bricks  
Electricity Kilowatt-hour | (KwH)  
Professional services | Chargeable hour  
Education | Enrolled student  
**Activity** | **Cost unit**  
Credit control | Account maintained  
Selling | Customer call

<table>
<thead>
<tr>
<th><strong>Cost Center</strong></th>
<th></th>
</tr>
</thead>
</table>
| **Type of cost centre** | **Examples**  
Service location | Stores, canteen  
Function | Sales representative  
Activity | Quality control  
Item of equipment | Packing machine

<table>
<thead>
<tr>
<th><strong>Cost classification</strong></th>
<th>Arrangement of elements of cost into logical groups with respect to their nature (fixed, variable, value adding), function (production, selling) or use in the business of the entity.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct cost</strong></td>
<td>Expenditure that can be attributed to a specific cost unit, for example material that forms part of a product.</td>
</tr>
<tr>
<td><strong>Prime cost</strong></td>
<td>Total of direct material, direct labor and direct expenses.</td>
</tr>
</tbody>
</table>
### Indirect cost or overhead
Expenditure on labor, materials or services that cannot be economically identified with a specific saleable cost unit.

### Product cost
Cost of a finished product built up from its cost elements.

### Period cost
Cost relating to a time period rather than to the output of products or services.

### Fixed cost
Cost incurred for an accounting period, that, within certain output or turnover limits, tends to be unaffected by fluctuations in the levels of activity (output or turnover).

- Fixed costs are the same, no matter how many units are produced. Note, however, that as the number of units increases, the fixed cost per unit actually decreases.
- This concept may seem confusing at first and it’s best to think in terms of numbers.

<table>
<thead>
<tr>
<th></th>
<th>20X1</th>
<th>20X2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed cost (Rs)</td>
<td>50,000</td>
<td>50,000</td>
</tr>
<tr>
<td>No of units produced</td>
<td>500</td>
<td>1,000</td>
</tr>
<tr>
<td>Fixed cost per unit (Rs: 50,000/no. of units)</td>
<td>100</td>
<td>50</td>
</tr>
</tbody>
</table>

Even though the costs are fixed, we still sometimes look at the cost per unit. Don’t let this confuse you – total fixed costs are fixed and do not vary with activity levels.

### Variable cost
Cost that varies with a measure of activity.

### Semi-variable cost
Cost containing both fixed and variable components and thus partly affected by a change in the level of activity.

### Relevant cost of an asset
Represents the amount of money that a company would have to receive if it were deprived of an asset in order to be no worse off than it already is. We can call this the **deprival value**.

**Example: Deprival value of an asset**

- A machine cost Rs: 14,000 ten years ago. It is expected that the machine will generate future revenues of Rs: 10,000. Alternatively, the machine could be scrapped for Rs: 8,000. An equivalent machine in the same condition would cost Rs: 9,000 to buy now. What is the deprival value of the machine?

**Solution**

- Firstly, let us think about the relevance of the costs given to us in the question.
- Cost of machine = Rs: 14,000 = past/sunk cost
- Future revenues = Rs: 10,000 = revenue expected to be generated
- Net realizable value = Rs: 8,000 = scrap proceeds
Replacement cost = Rs: 9,000

When calculating the **deprival value** of an asset, use the following diagram.

<table>
<thead>
<tr>
<th>LOWER OF</th>
<th>HIGHER OF</th>
</tr>
</thead>
<tbody>
<tr>
<td>REPLACEMENT COST</td>
<td>(Rs: 10,000)</td>
</tr>
<tr>
<td>(Rs: 9,000)</td>
<td></td>
</tr>
<tr>
<td>NRV</td>
<td>EXPECTED REVENUES</td>
</tr>
<tr>
<td>(Rs: 8,000)</td>
<td>(Rs: 10,000)</td>
</tr>
</tbody>
</table>

Therefore, the deprival value of the machine is the lower of the replacement cost and Rs: 10,000. The deprival value is therefore Rs: 9,000.

**Relevant range**

Activity levels within which assumptions about cost behavior in breakeven analysis remain valid

The relevant range also broadly represents the **activity levels at which an organization has had experience of operating at in the past** and for which **cost information is available**. It can therefore be dangerous to attempt to predict costs at activity levels which are outside the relevant range.

**Apportion**

To spread indirect revenues or costs over two or more cost units, centers, accounts or time periods.

**Re-apportion**

The re-spread of costs apportioned to service departments to production departments.

**Overhead absorption rate**

A means of attributing overhead to a product or service, based for example on direct labour hours, direct labour cost or machine hours. There are a number of different **bases of absorption** (or ‘overhead recovery rates’) which can be used. Examples are as follows.

1. A percentage of direct materials cost
2. A rate per machine hour
3. A percentage of direct labour cost
4. A rate per direct labour hour
5. A percentage of prime cost
6. A rate per unit

**Marginal cost**

Part of the cost of one unit of product or service that would be avoided if the unit was not produced, or that would increase if one extra unit were produced.

**Contribution**

Sales value – variable cost of sales

**Marginal (or variable) costing**

Assigns only variable costs to cost units while fixed costs are written off as period costs.

**FIFO (first in, first out)**

Used to price issues of goods or materials based on the cost
of the oldest units held, irrespective of the sequence in which the actual issue of units held takes place. Closing stock is, therefore, valued at the cost of the oldest purchases.

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIFO (last in, first out)</td>
<td>Used to price issues of goods or materials based on the cost of the most recently received units. Cost of sales in the income statement is, therefore, valued at the cost of the most recent purchases.</td>
</tr>
<tr>
<td>Average cost</td>
<td>Used to price issues of goods or materials at the weighted average cost of all units held.</td>
</tr>
<tr>
<td>Cost-volume-profit analysis (CVP)</td>
<td>Study of the effects on future profit of changes in fixed cost, variable cost, sales price, quantity and mix.</td>
</tr>
<tr>
<td>Breakeven point</td>
<td>Level of activity at which there is neither profit nor loss.</td>
</tr>
<tr>
<td>C/S ratio (P/V ratio)</td>
<td>A measure of how much contribution is earned from each Rs: 1 of sales.</td>
</tr>
<tr>
<td>Margin of safety</td>
<td>Indicates the percentage by which forecast revenue exceeds or falls short of that required to break even. As well as being interested in the breakeven point, management may also be interested in the amount by which actual sales can fall below anticipated sales without a loss being incurred. This is the margin of safety.</td>
</tr>
<tr>
<td>Limiting factor or key factor</td>
<td>Anything which limits the activity of an entity. An entity seeks to optimize the benefit it obtains from the limiting factor. Examples are a shortage of supply of a resource or a restriction on sales demand at a particular price. It is assumed in limiting factor analysis that management wishes to maximize profit and that profit will be maximized when contribution is maximized (given no change in fixed cost expenditure incurred). In other words, marginal costing ideas are applied.</td>
</tr>
<tr>
<td>Standard cost</td>
<td>Planned unit cost of a product, component or service.</td>
</tr>
<tr>
<td>Standard costing</td>
<td>Control technique that reports variances by comparing actual costs to pre-set standards so facilitating action through management by exception.</td>
</tr>
<tr>
<td>Management by exception</td>
<td>Practice of concentrating on activities that require attention and ignoring those which appear to be conforming to expectations. Typically standard cost variances or variances from budget are used to identify those activities that require attention.</td>
</tr>
<tr>
<td>Performance standard</td>
<td>Ideal standards are based on the most favorable operating conditions, with no wastage, no inefficiencies, no idle time and no breakdowns. These standards are likely to have an</td>
</tr>
</tbody>
</table>
unfavorable motivational impact, because employees will often feel that the goals are unattainable and not work so hard.

**Attainable standards** are based on efficient (but not perfect) operating conditions. Some allowance is made for wastage, inefficiencies, machine breakdowns and fatigue. If well-set they provide a useful psychological incentive, and for this reason they should be introduced whenever possible. The consent and co-operation of employees involved in improving the standard are required.

**Current standards** are standards based on current working conditions (current wastage, current inefficiencies). The disadvantage of current standards is that they do not attempt to improve on current levels of efficiency, which may be poor and capable of significant improvement.

**Basic standards** are standards which are kept unaltered over a long period of time, and may be out-of-date. They are used to show changes in efficiency or performance over an extended time period. Basic standards are perhaps the least useful and least common type of standard in use.

<table>
<thead>
<tr>
<th>Variance</th>
<th>The difference between a planned, budgeted, or standard cost and the actual cost incurred. The same comparisons may be made for revenues.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct material total variance</strong></td>
<td>Measurement of the difference between the standard material cost of the output produced and the actual material cost incurred.</td>
</tr>
<tr>
<td><strong>Direct material price variance</strong></td>
<td>Difference between the actual prices paid for the purchased materials and their standard cost.</td>
</tr>
<tr>
<td><strong>Direct material usage variance</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Direct labor total variance</strong></td>
<td>Indicates the difference between the standard direct labor cost of the output which has been produced and the actual direct labor cost incurred.</td>
</tr>
<tr>
<td><strong>Direct labor rate variance</strong></td>
<td>Indicates the actual cost of any change from the standard labor rate of remuneration.</td>
</tr>
<tr>
<td><strong>Direct labor efficiency variance</strong></td>
<td>Standard labor cost of any change from the standard level of labor efficiency.</td>
</tr>
<tr>
<td><strong>Direct labour idle time variance</strong></td>
<td>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 labor efficiency variance.</td>
</tr>
<tr>
<td>Variable production overhead total variance</td>
<td>Measures the difference between variable overhead that should be used for actual output and variable production overhead actually used.</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Variable production overhead expenditure variance</td>
<td>Indicates the actual cost of any change from the standard rate per hour.</td>
</tr>
<tr>
<td>Variable production OVH efficiency variance</td>
<td>Standard variable overhead cost of any change from the standard level of efficiency.</td>
</tr>
<tr>
<td>Sales price variance</td>
<td>Change in revenue caused by the actual selling price differing from that budgeted.</td>
</tr>
</tbody>
</table>
| Sales volume contribution variance | The sales volume variance in units is the difference between the actual units sold and the budgeted quantity. This variance in units can be valued in one of three ways:  
  • In terms of standard revenue,  
  • Standard gross margin or  
  • Standard contribution margin.  
  (a) At the standard gross profit margin per unit. This is the sales volume profit variance and it measures the change in profit (in an absorption costing system) caused by the sales volume differing from budget.  
  (b) At the standard contribution per unit. This is the sales volume contribution variance and it measures the change in profit (in a marginal costing system) caused by the sales volume differing from budget.  
  (c) At the standard revenue per unit. This is the sales volume revenue variance and it measures the change in sales revenue caused by sales volume differing from that budgeted. |
| Sales price variance | Change in revenue caused by the actual selling price differing from that budgeted. |

Suppose that a company budgets to sell 8,000 units of product J for Rs: 12 per unit. The standard variable cost per unit is Rs: 4 and the standard full cost is Rs: 7 per unit. Actual sales were 7,700 units, at Rs: 12.50 per unit.

The sales volume variance in units is 300 units adverse (8,000 units budgeted – 7,700 units sold). The variance is adverse because actual sales volume was less than budgeted. The sales volume variance in units can be evaluated in the three ways described above.

(a) Sales volume profit variance = 300 units × standard gross profit margin per unit  
= 300 units × Rs: (12 – 7) = Rs: 1,500 (A)
(b) Sales volume contribution variance = 300 units × standard contribution per unit
   = 300 units × Rs: (12 – 4) = Rs: 2,400 (A)

(c) Sales volume revenue variance = 300 units × standard revenue per unit
   = 300 units × Rs: 12 = Rs: 3,600 (A)

Note that the sales volume profit variance (in an absorption costing system) and the sales volume contribution variance (in a marginal costing system) can be derived from the sales volume revenue variance, if the profit mark-up percentage and the contribution to sales (C/S) ratio respectively are known.

In our example the profit mark-up percentage is 41.67% (Rs: 5/Rs: 12) and the C/S ratio is 66.67% (Rs: 8/Rs: 12).

Therefore the sales volume profit variance and the sales volume contribution variance, derived from the sales volume revenue variance, are as follows.

Sales volume profit variance = Rs: 3,600 (A) × 41.67% = Rs: 1,500 (A), as above

Sales volume contribution variance = Rs: 3,600 (A) × 66.67%
   = Rs: 2,400 (A), as above

J has the following budget and actual figures for year 4.

<table>
<thead>
<tr>
<th>Budget</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales units</td>
<td>600</td>
</tr>
<tr>
<td>Selling price per unit Rs:</td>
<td>30</td>
</tr>
</tbody>
</table>

Standard full cost of production = Rs: 28 per unit.
Standard variable cost of production = Rs: 19 per unit

Calculate the following sales variances
(a) Selling price variance (c) Sales volume contribution variance
(b) Sales volume profit variance (d) Sales volume revenue variance

(a) Sales revenue for 620 units should have been (× Rs: 30)
   18,600 but was (× Rs: 29) 17,980. Selling price variance 620 (A)
(b) Budgeted sales volume 600 units  
Actual sales volume 620 units  
Sales volume variance in units 20 units (F)  
Sales volume profit variance = 20 units × Rs: (30 – 28) = Rs: 40 (F)

(c) Sales volume contribution variance = 20 units × Rs: (30 – 19) = Rs: 220(F)

(d) Sales volume revenue variance = 20 units × Rs: 30 = Rs: 600(F)  
In this question you were asked to calculate both the sales volume profit variance and the sales volume contribution variance to give you some practice. However, the two variances would never be found together in the same system in a real situation. Either a marginal costing system is used, in which case the sale volume contribution variance is calculated, or an absorption costing system is used, in which case a sales volume profit variance is calculated.

<table>
<thead>
<tr>
<th>Budget purposes</th>
<th>Budget purposes</th>
<th>Budget purposes</th>
<th>Budget purposes</th>
<th>Budget purposes</th>
</tr>
</thead>
<tbody>
<tr>
<td>May help in authorizing expenditure, communicating objectives and plans, controlling operations, co-ordinating activities, evaluating performance, planning and rewarding performance. Often, reward systems involve comparison of actual with budgeted performance.</td>
<td>Quantitative expression of a plan for a defined period of time. It may include planned sales volumes and revenues; resource quantities, costs and expenses; assets, liabilities and cash flows.</td>
<td>Period for which a budget is prepared, and used, which may then be sub-divided into control periods.</td>
<td>Detailed set of guidelines and information about the budget process typically including a calendar of budgetary events, specimen budget forms, a statement of budgetary objectives and desired results, listing of budgetary activities and budget assumptions, regarding, for example, inflation and interest rates.</td>
<td>Limits the activities of an undertaking. Identification of the principal budget factor is often the starting point in the budget setting process. Often the principal budget factor will be sales demand but it could be production capacity or material supply.</td>
</tr>
</tbody>
</table>

Budget flexing
<table>
<thead>
<tr>
<th><strong>Integrated accounts</strong></th>
<th>Set of accounting records that integrates both financial &amp; cost accounts using a common input of data for all accounting purposes.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Process costing</strong></td>
<td>Form of costing applicable to continuous processes where process costs are attributed to the number of units produced. This may involve estimating the number of equivalent units in stock at the start and end of the period under consideration.</td>
</tr>
<tr>
<td><strong>Normal loss</strong></td>
<td>Expected loss, allowed for in the budget, and normally calculated as a percentage of the good output, from a process during a period of time. Normal losses are generally either valued at zero or at their disposal values.</td>
</tr>
<tr>
<td><strong>Abnormal loss</strong></td>
<td>Any loss in excess of the normal loss allowance.</td>
</tr>
<tr>
<td><strong>Abnormal gain</strong></td>
<td>Improvement on the accepted or normal loss associated with a production activity.</td>
</tr>
<tr>
<td><strong>Scrap</strong></td>
<td>Discarded material having some value.</td>
</tr>
<tr>
<td><strong>Equivalent units</strong></td>
<td>Notional whole units representing incomplete work. Used to apportion costs between work in progress and completed output.</td>
</tr>
<tr>
<td><strong>Joint products</strong></td>
<td>Two or more products produced by the same process and separated in processing, each having a sufficiently high saleable value to merit recognition as a main product.</td>
</tr>
<tr>
<td><strong>By-product</strong></td>
<td>Output of some value produced incidentally while manufacturing the main product.</td>
</tr>
<tr>
<td><strong>Job</strong></td>
<td>Customer order or task of relatively short duration.</td>
</tr>
<tr>
<td><strong>Job costing</strong></td>
<td>Form of specific order costing where costs are attributed to individual jobs.</td>
</tr>
<tr>
<td><strong>Batch costing</strong></td>
<td>Form of specific order costing where costs are attributed to batches of product (unit costs can be calculated by dividing by the number of products in the batch).</td>
</tr>
<tr>
<td><strong>Contract costing</strong></td>
<td>Form of specific order costing where costs are attributed to contracts.</td>
</tr>
<tr>
<td><strong>Departmental/functional budget</strong></td>
<td>Budget of income and/or expenditure applicable to a particular function frequently including sales budget, production cost budget (based on budgeted production, efficiency and utilization), purchasing budget, human resources budget, marketing budget and research and development budget.</td>
</tr>
<tr>
<td><strong>Approaches to budgeting</strong></td>
<td><strong>1 - Incremental budgeting</strong>&lt;br&gt;The traditional approach to budgeting is to base next year’s budget on the current year’s results plus an extra amount</td>
</tr>
</tbody>
</table>
for estimated growth or inflation next year. This approach is known as **incremental budgeting** since it is concerned mainly with the increments in costs and revenues which will occur in the coming period.

**2 - Zero-based budgeting**

Zero-based budgeting involves preparing a budget for each cost centre from a zero base. Every item of expenditure has then to be justified in its entirety in order to be included in the next year's budget.

ZBB rejects the assumption inherent in incremental budgeting that next year's budget can be based on this year's costs.

**3 - Rolling budgets**

As an organization and the environment it operates in are dynamic (always changing) management may decide to introduce a system of **rolling budgets** (also called **continuous budgets**). A rolling budget is a budget which is continuously updated by adding a further accounting period (a month or quarter) when the earlier accounting period has expired.

**4 - Participative budgeting**

Participative budgeting is 'A budgeting system in which all budget holders are given the opportunity to participate in setting their own budgets'.

| **Cash budget** | Detailed budget of estimated cash inflows and outflows incorporating both revenue and capital items. |
| **Fixed budget** | Budget set prior to the control period and not subsequently changed in response to changes in activity, costs or revenue. It may serve as a benchmark in performance evaluation. |
# Cost of Goods Sold Formulae

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>FORMULAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Prime/Basic/Flat Cost</td>
<td>Direct Material + Direct Labor + Direct Expenses</td>
</tr>
<tr>
<td>2 Number of Unit Made</td>
<td>Unit Sold + Closing unit of finished goods - Opening unit of finished goods</td>
</tr>
<tr>
<td>3 Per unit Cost</td>
<td>Cost of Good Manufactured / Unit Made</td>
</tr>
<tr>
<td>4 Work-In-Process Closing Stock</td>
<td>Direct Material + Direct Labor + Factory Overhead</td>
</tr>
<tr>
<td>5 Gross Profit</td>
<td>Sales – Cost of Goods Sold</td>
</tr>
<tr>
<td>6 Finished Goods Closing Unit</td>
<td>Per unit cost * F.G close unit</td>
</tr>
<tr>
<td>7 Sales</td>
<td>Gross Profit + Cost of goods sold</td>
</tr>
<tr>
<td>8 Under/Over Applied</td>
<td>Actual FOH – Applied FOH (Actual Hours * FOH Applied Rate)</td>
</tr>
<tr>
<td>9 Unit Consumed</td>
<td>Opening Stock + Purchases – Closing Stock</td>
</tr>
<tr>
<td>10 Gross Profit/Net Profit Per Unit</td>
<td>Gross Profit or Net Profit / unit sold</td>
</tr>
<tr>
<td>11 FOH Applied Rate</td>
<td>Total FOH cost / Capacity Level * 100</td>
</tr>
<tr>
<td>12 Sales in Net Income</td>
<td>Net Income / % * 100</td>
</tr>
<tr>
<td>13 Gross Profit/Net Profit to Sales</td>
<td>Gross Profit or Net Profit / Net sales *100</td>
</tr>
<tr>
<td>15 Total Manufacturing Cost</td>
<td>Direct Material + Direct Labor + Direct Expenses + Factory Overhead</td>
</tr>
<tr>
<td>16 Conversion Cost</td>
<td>Direct Labor + Factory Overhead</td>
</tr>
<tr>
<td>17 Per Unit Sale Price</td>
<td>Profit + Operating cost + Per unit cost</td>
</tr>
<tr>
<td>18 % of Cost Sale Price</td>
<td>Purchase at cost / Purchase at sale *100</td>
</tr>
<tr>
<td>19 Purchase at Sale Price</td>
<td>Sales + Closing stock – Opening stock</td>
</tr>
<tr>
<td>20 Under/Over FOH Adjustment</td>
<td>Under or Over applied / Cost Of Goods Sold or Work-In-Process or Finished Goods * 100</td>
</tr>
<tr>
<td>21 Cost Of Goods Sold Per Unit</td>
<td>Cost of Goods Sold / unit sold</td>
</tr>
<tr>
<td>22 Number of Unit Sold</td>
<td>Total Gross Profit last year / Expected Gross Profit per unit * 100</td>
</tr>
<tr>
<td>23 Cost Of Goods Manufactured</td>
<td>Total Manufacturing Cost + Open Work-In-Process – Closing Work-In-Process</td>
</tr>
<tr>
<td>24 Cost Of Goods Sold</td>
<td>Cost Of Goods Manufactured + Open Finished Goods – Closing Finished Goods</td>
</tr>
<tr>
<td>25 Increase by/ Decrease by</td>
<td>Increase by = Less &amp; Decrease by = Add</td>
</tr>
</tbody>
</table>
## Format of Cost of Goods Sold Statement

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening Raw Material</td>
<td>XXX</td>
</tr>
<tr>
<td>Purchases</td>
<td>XXX</td>
</tr>
<tr>
<td>Add--Direct Expenses</td>
<td>XXX</td>
</tr>
<tr>
<td>Less – Closing Raw Material</td>
<td>(XXX)</td>
</tr>
<tr>
<td><strong>Direct Material Used</strong></td>
<td>XXX</td>
</tr>
<tr>
<td>Direct Labor</td>
<td>XXX</td>
</tr>
<tr>
<td>Direct Expenses</td>
<td>XXX</td>
</tr>
<tr>
<td>Factory Over Head/ Supplementary Cost – <strong>W: 2</strong></td>
<td>XXX</td>
</tr>
<tr>
<td>**Total Production Cost (Normal) – <strong>W: 1</strong></td>
<td>XXX</td>
</tr>
<tr>
<td>Opening Work-In-Process</td>
<td>XXX</td>
</tr>
<tr>
<td>Cost of Goods to be Made</td>
<td>XXX</td>
</tr>
<tr>
<td>Closing Work-In-Process</td>
<td>(XXX)</td>
</tr>
<tr>
<td><strong>Cost of Goods Manufactured (Normal)</strong></td>
<td>XXX</td>
</tr>
<tr>
<td>Opening Finished Goods</td>
<td>XXX</td>
</tr>
<tr>
<td>Cost of Goods to be Sold</td>
<td>XXX</td>
</tr>
<tr>
<td>Closing Finished Goods</td>
<td>(XXX)</td>
</tr>
<tr>
<td><strong>Cost of Goods Sold (Normal)</strong></td>
<td>XXX</td>
</tr>
<tr>
<td>Add—Under applied</td>
<td>XXX</td>
</tr>
<tr>
<td>Less—Over applied</td>
<td>(XXX)</td>
</tr>
<tr>
<td><strong>Cost of Goods Sold (Actual)</strong></td>
<td>XXX</td>
</tr>
</tbody>
</table>

**W-1** = Also called Total Manufacturing Cost OR Total Cost

**W-2** = Factory Overhead = Indirect Material + Indirect Labor + Indirect Expenses

**W-3** = Actual FOH

Applied FOH

**Under/Over Applied**

Formula to decide **Under/Over Applied** is:

\[
\text{NOPU} \text{ (Negative: Over applied & Positive: Under applied)}
\]

**Gross Profit** = Sales – Cost of Goods Sold (Actual)
## Problems in preparation of Cogs Statement

### Assume:
- Gross Profit = 290,000
- Sales = 600,000
- COGS = 310,000

### Gross Profit Margin Rate

<table>
<thead>
<tr>
<th>Gross Profit Margin Rate</th>
<th>Gross Profit margin rate = Gross Profit / Sales x 100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This ratio identifies the ratio of gross profit over sales. In this ratio sale is held equal to 100%. The %age of cost of goods sold is 100 – the %age margin. It means that if margin is 25%, then %age cost of goods sold will be 75%. E.g.: 290,000/600,000 x 100 = 48.33%.</td>
</tr>
</tbody>
</table>

### Gross Profit Markup Rate

<table>
<thead>
<tr>
<th>Gross Profit Markup Rate</th>
<th>Gross Profit markup rate = Gross Profit / Cost of goods sold x 100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This ratio identifies the ratio of gross profit over cost of goods sold. In this ratio cost of goods sold is held equal to 100%. The %age of sales is 100 + the %age of markup. It means that if markup is 25% then %age of sales will be 125%. E.g.: 290,000/310,000 x 100 = 93.5%. These ratios are also known as cost structure ratios.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>In case of Margin</th>
<th>In case of Markup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>100%</td>
<td>125%</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>75%</td>
<td>100%</td>
</tr>
<tr>
<td>Gross profit</td>
<td>25%</td>
<td>25%</td>
</tr>
</tbody>
</table>

As shown above in both of the cases gross profit is 25% but the base is different. Where the sale is 100% the cost of goods sold is 75%, where the cost of goods sold is 100% the sales is 125%.

At this stage sometimes sales figure is missing and it is required to calculate gross profit using the margin rate (based on sales). The given information in this case is cost of goods sold. Most of the students make a common error, they straight away calculate gross profit %age on the figure of cost of goods sold, this is wrong in this situation as the base is the figure of sales which is not given. Here the following formula will be used to calculate gross profit:

Required information =

given information x %age of required information

%age of given information

In the above situation where cost of goods sold is given and gross profit is to be calculated using the margin rate (based on sales), following calculations will be followed:

Gross profit = Cost of goods sold (absolute amount) x 25%/75%

Same concept is followed where cost of goods sold figure is missing and it is required to calculate gross profit using the markup rate.
(based on cost of goods sold). The given information in this case is that of sales. Most of the students make a common error, they straight away calculate gross profit %age on sales, this is wrong, as the base should be cost of goods sold where markup rate is to be used. Here again the above formula will be used to calculate gross profit:

\[
\text{Required information} = \frac{\text{given information} \times \% \text{age of required information}}{\% \text{age of given information}}
\]

In the above situation where sales is given and gross profit is to be calculated using the markup rate (based on cost of goods sold), following calculations will be followed:

Gross profit = Sales (absolute amount) x 25%/125%

<table>
<thead>
<tr>
<th>Net Profit Ratio</th>
<th>Net Profit ratio = Net Profit/Sales x 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventory Turnover Ratio</td>
<td>Inventory turnover ratio = \frac{\text{Cost of goods sold}}{\text{Average inventory}}</td>
</tr>
<tr>
<td>Average inventory = \frac{\text{Opening Inventory} + \text{Closing Inventory}}{2}</td>
<td></td>
</tr>
<tr>
<td>Inventory Holding Period</td>
<td>Inventory holding period in days = \frac{\text{Number of days in a year}}{\text{Inventory turnover ratio}}</td>
</tr>
<tr>
<td>Alternatively = \frac{\text{Average inventory} \times 365}{\text{Cost of goods sold}}</td>
<td></td>
</tr>
</tbody>
</table>

**Cost Behavior - Per Unit of Production**

<table>
<thead>
<tr>
<th></th>
<th>Per Unit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Cost</td>
<td>Increase</td>
<td>Constant</td>
</tr>
<tr>
<td>Variable Cost</td>
<td>Constant</td>
<td>Decrease</td>
</tr>
<tr>
<td>Total Cost</td>
<td>Increase</td>
<td>Decrease</td>
</tr>
</tbody>
</table>
COST CLASSIFICATION

Figure 1.10 Elements of cost

Notes:
1. The above chart is based on the absorption costing principle.
2. In the case of marginal costing, the amount of production overhead absorbed would relate to the variable element only.
3. The relative sizes of the boxes are of no significance.

Example
- Component parts
- Work consumed in product
- Tool hire for specific job
- Material used in negligible amounts
- Non-production personnel
- Factory insurance
- Administration stationery
- Accountants salaries
- Office building depreciation
- Invoice posting/stationery
- Sales people salaries
- Advertising
- Cost of packing cases
- Despatch clerk wages
- Warehouse depreciation
### PROCESS COSTING

<table>
<thead>
<tr>
<th>POINTS</th>
<th>TREATMENTS</th>
</tr>
</thead>
</table>
| Good units | **Formula** = Transfer + still + complete but still  
- There will be no loss adjustment in 1st department as the good units will absorb the bad / loss units.  
- If losses are in accordance with normal practice i.e. standard levels, they are termed as normal loss. If they are above expectation, they are known as abnormal losses. |
| Adjustment of loss units (2nd department) | **Unit loss * unit cost of last deptt**  
**OR**  
Unit cost after adjustment (Total cost / good units) = XXX  
Unit cost before adjustment = XXX |
| Normal loss at the end |  
- No adjustment of loss units  
- Loss units are included in EPR  
- Cost transfer to next deptt (Transfer + Loss)  
- **Per Unit Cost**: Cost Transfer + Unit Transfer |
| Increase in units | **Adjustment of Per Unit cost**: Cost receive by last deptt  
**Good Units**  
- Normal spoilage in increase units needs no adjustment.  
- Double line under unit cost of last deptt in increase units case only.  
**Adjusted cost of last deptt**:  
Unit still * unit cost of last deptt + adjustment of loss unit  
**In case of increase units**: Unit still * adjusted per unit cost |
| Input material & material introduced | Material introduced is extra material needed in the process & should always be shown separately from input material.  
Whenever there are partly completed units at the end of the period, they may contain two classification of material i.e.  
Input Material (i.e. previous process costs) = Always 100% complete.  
Material Introduced = which may or may not be complete.  
Input material may also be described as:  
- Units Transferred.  
- Cost of goods or units transferred.  
- Previous Process Costs. |
**WORK IN PROGRESS BEGINNING INVENTORY (AVCO)**

- Life is very simple & easy in average costing. There is no need of By-furcating of finished goods & no remaining percentages are to be considered for opening units.
- Please add open WIP cost in per unit cost calculation.
- There is no need to add opening WIP cost to finished goods at the end.

**FIRST DEPARTMENT:**

- No change in Equivalent Production Report (EPR).
- Cost of Work-In-Process beginning inventory included in “Cost Charged to department”. Ignore unit cost.
- **Unit Cost calculation:**

  \[ \text{WIP beginning inventory cost} \times \text{cost charged by department} \]

  \[ \frac{\text{EPR units}}{} \]

**SECOND & FURTHER DEPARTMENT:**

- No change in Equivalent Production Report (EPR).
- Cost of WIP beginning inventory included in “Cost Charged to department”. Ignore unit cost.
- **Unit Cost calculation:**

  \[ \text{WIP beginning inventory cost} \times \text{cost charged by department} \]

  \[ \frac{\text{EPR units}}{} \]

- **Cost of preceding department:**

<table>
<thead>
<tr>
<th>T.C.</th>
<th>U.C.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of last department</td>
<td>XXX</td>
</tr>
<tr>
<td>Cost of WIP opening inventory</td>
<td>XXX</td>
</tr>
<tr>
<td></td>
<td>XXX</td>
</tr>
</tbody>
</table>
WORK IN PROGRESS BEGINNING INVENTORY (FIFO)

- Always take remaining % (100% - % given) for opening inventory in statement of equivalent unit calculation.
- Do not add opening WIP cost in per unit cost calculation.
- Please remember to add opening WIP cost to finished goods at the end.
- Total of cost of opening WIP inventory is to be written in “Cost Charged to department”.
- No unit cost written on opening WIP inventory.

TRANSFER TO NEXT DEPARTMENT:

FROM CURRENT PRODUCTION (unit transfer * unit cost)

FROM OPENING WIP INVENTORY

<table>
<thead>
<tr>
<th>Inventory Cost</th>
<th>(As given in the question)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material</td>
<td>(WIP unit * stage completion % * unit cost)</td>
</tr>
<tr>
<td>Direct labor</td>
<td>(WIP unit * stage completion % * unit cost)</td>
</tr>
<tr>
<td>Factory Overhead</td>
<td>(WIP unit * stage completion % * unit cost)</td>
</tr>
</tbody>
</table>

FROM CLOSING WIP INVENTORY

<table>
<thead>
<tr>
<th>Inventory Cost</th>
<th>(WIP unit * stage completion % * unit cost)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material</td>
<td>(WIP unit * stage completion % * unit cost)</td>
</tr>
<tr>
<td>Direct labor</td>
<td>(WIP unit * stage completion % * unit cost)</td>
</tr>
<tr>
<td>Factory Overhead</td>
<td>(WIP unit * stage completion % * unit cost)</td>
</tr>
</tbody>
</table>

ABNORMAL LOSS

- Abnormal losses cannot be foreseen. It should be excluded from routine reporting & only normal costs charged to production. Abnormal losses are costed on the same basis as good production.
- Factors of Abnormal Loss:
  - Plant break down.
  - Industrial accidents.
  - Inefficient working.
  - Unexpected defects.
  - Unexpected favorable conditions.
- Formula: Abnormal loss (gain) = Actual loss – Normal loss.
- No adjustment of loss units
- Loss units are included in EPR
- Cost of abnormal loss:
## EQUIVALENT PRODUCTION REPORT

### FOR FIFO

<table>
<thead>
<tr>
<th></th>
<th>Previous Deptt</th>
<th>Direct Material</th>
<th>Direct Labor</th>
<th>FOH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Opening WIP (Given)</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Abnormal Loss</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Abnormal Gain</td>
<td>(XXX)</td>
<td>(XXX)</td>
<td>(XXX)</td>
<td>(XXX)</td>
</tr>
<tr>
<td>Current Production</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Opening WIP (1 – % * 100)</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Closing WIP (Given)</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>TOTAL UNITS</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
</tbody>
</table>

### FOR OTHERS

<table>
<thead>
<tr>
<th></th>
<th>Previous Deptt</th>
<th>Direct Material</th>
<th>Direct Labor</th>
<th>FOH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Closing WIP</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Abnormal Loss</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Abnormal Gain</td>
<td>(XXX)</td>
<td>(XXX)</td>
<td>(XXX)</td>
<td>(XXX)</td>
</tr>
<tr>
<td>Normal Loss (2nd Deptt)</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Normal Loss at end</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>TOTAL UNITS</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
</tbody>
</table>

### COST PER UNIT

\[
\text{COST PER UNIT} = \frac{\text{Total costs}}{\text{Total equivalent production units}}
\]

### TOTAL COST FOR PERIOD

\[
\text{TOTAL COST FOR PERIOD} = \text{Value of completed units} + \text{Value of W-I-P}
\]

- An equivalent unit means ‘**equal to one finished unit of output**’.
- One fully-finished unit of production = 1 equivalent unit
- One unit 50% complete = 0.50 equivalent units. 400 units 50% complete = 200 equivalent units.
- One unit 20% complete = 0.20 equivalent units. 400 units 20% complete = 80 equivalent units.
Costs are shared between finished units and inventory by calculating a cost per equivalent unit:

- Cost per equivalent unit = Costs of the process/Number of equivalent units produced

| Equivalent units of closing inventory | It is normally assumed that direct materials are added to the production process at the beginning of the process and that direct labor operations are carried out throughout the process. When this assumption is used, units of closing inventory are:
  - 100% complete for direct material costs added at the beginning of the process,
  - Only partly-complete for direct labor and production overhead costs,
  - Only partly complete for additional materials that are added throughout the process.

  The number of equivalent units of direct materials cost in a period will therefore differ from the number of equivalent units of conversion costs (direct labor and production overhead).

| Equivalent units: weighted average cost method | The assumption is that all units produced during the period and all units of closing inventory should be valued at the same cost per equivalent unit for materials and the same cost per equivalent unit for conversion costs.

  An average cost per equivalent unit is therefore calculated for all units of output and closing inventory. This includes the units that were partly-completed at the beginning of the period (and which were therefore valued as closing WIP at the end of the previous period).

| Equivalent units: fifo method | It is assumed that all units of output in a period have the same cost per unit.

  With the first-in, first-out (FIFO) method of process costing, it is assumed that the opening units of work-in-process at the beginning of the month will be the first units completed. The cost of these units is their value at the beginning of the period plus the cost to complete them in the current period. |
**PROCESS ACCOUNT – VARIATIONS**

<table>
<thead>
<tr>
<th>S.No</th>
<th>American Approach</th>
<th>British Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CPR</td>
<td>Process A/C</td>
</tr>
<tr>
<td>2</td>
<td>Departments</td>
<td>Processes</td>
</tr>
<tr>
<td>3</td>
<td>Work in process</td>
<td>Work in progress</td>
</tr>
<tr>
<td>4</td>
<td>No abnormal gain concept</td>
<td>abnormal gain concept</td>
</tr>
<tr>
<td>5</td>
<td>Scrap value of Normal Loss is ignored</td>
<td>Scrap value of Normal Loss is considered</td>
</tr>
<tr>
<td>6</td>
<td>Normal Loss is calculated at the end of process</td>
<td>Normal Loss is considered from beginning &amp; considered specific value while computing cost of finished goods</td>
</tr>
<tr>
<td>7</td>
<td>% of Normal Loss is applied on input/output</td>
<td>% of Normal Loss is always applied on input</td>
</tr>
</tbody>
</table>

**PROCESS ACCOUNT – BRITISH APPROACH**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Qty</th>
<th>Amount</th>
<th>Particulars</th>
<th>Qty</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rs.</td>
<td></td>
<td></td>
<td>Rs.</td>
</tr>
<tr>
<td>Opening Balance</td>
<td>XXX</td>
<td>XXX</td>
<td>Transfer to next deptt</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Direct Material</td>
<td>XXX</td>
<td>XXX</td>
<td>Normal Loss</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Direct Labor</td>
<td>XXX</td>
<td>XXX</td>
<td>Abnormal Loss</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Factory Overhead</td>
<td></td>
<td>XXX</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional Overhead</td>
<td>XXX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Expenses</td>
<td>XXX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOH Allocated</td>
<td>XXX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abnormal Gain</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td></td>
<td>TOTAL</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>XXX</td>
<td><strong>TOTAL</strong></td>
<td></td>
<td>XXX</td>
</tr>
</tbody>
</table>

**Notes:**

1. The output of one process becomes the input to the next until the finished product is made in the final process.
2. Process account is no more than a ledger with debit & credit entries.
3. Quantity column is just a memorandum column which means that we just have to balance it.
4. Direct labor & factory overhead may be treated together as conversion cost.
5. Valuation of abnormal loss = Total Cost – Scrap/Normal production
6. Valuation of abnormal gain = Total Cost – Scrap/Normal production
7. Normal loss VS Abnormal loss

<table>
<thead>
<tr>
<th>Points</th>
<th>Normal Loss</th>
<th>Abnormal Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature</td>
<td>Unavoidable</td>
<td>Avoidable</td>
</tr>
<tr>
<td>Existence</td>
<td>Inherent</td>
<td>Non-Inherent</td>
</tr>
<tr>
<td>Factors</td>
<td>Shrinkage, evaporation, spoilage</td>
<td>Unforeseen factors, Abnormal conditions like: Maladministration, Bad design, Negligence on part of labor</td>
</tr>
<tr>
<td>Inclusion</td>
<td>Credited to process account</td>
<td>Credited to process account</td>
</tr>
</tbody>
</table>

6. Normal loss = normal loss units * scrap value
- Normal loss is not given in cost if it does not have a scrap value.
- Units of normal loss are valued at zero equivalent units i.e. they don’t carry any of the process costs.
- Normal loss types:
  - Start
  - During
  - End
  - Not included in EPR
  - Not included in EPR
  - Included in EPR

7. Abnormal loss = abnormal loss units * per unit cost
8. Abnormal Gain = abnormal gain units * per unit cost
9. How to determine Abnormal Loss / Gain?

<table>
<thead>
<tr>
<th></th>
<th>XXX</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal Loss</td>
<td>(XXX)</td>
<td></td>
</tr>
<tr>
<td>Transfer</td>
<td>(XXX)</td>
<td></td>
</tr>
<tr>
<td>Abnormal Loss/ Gain</td>
<td>XXX</td>
<td></td>
</tr>
</tbody>
</table>

**DECISION RULE**

<table>
<thead>
<tr>
<th>Positive</th>
<th>Abnormal Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>Abnormal Gain</td>
</tr>
</tbody>
</table>

10. Cost Per Unit:

Total cost – Normal Loss scrap value – NRV of by product produced

Total units – Normal loss Units – By Product Units

OR
Transfer + Abnormal Loss – Abnormal Gain

11. Completion Stages for EPR as per **BRITISH APPROACH**:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Normal Loss at the end</strong></td>
<td>100% completed units</td>
</tr>
<tr>
<td><strong>Abnormal Loss</strong></td>
<td>100% completed units</td>
</tr>
<tr>
<td><strong>Abnormal Gain</strong></td>
<td>100% completed units</td>
</tr>
</tbody>
</table>

12. **Accounting for Scrap Values**:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Normal Loss</strong></td>
<td>Credited to process account</td>
</tr>
<tr>
<td><strong>Abnormal Loss</strong></td>
<td>Credited to abnormal loss account. Process account is credited with per unit cost only.</td>
</tr>
<tr>
<td><strong>Abnormal Gain</strong></td>
<td>Debited to abnormal loss account. Process account is debited with per unit cost only.</td>
</tr>
</tbody>
</table>

13. **Formula to determine Abnormal Loss/Gain**:

<table>
<thead>
<tr>
<th><strong>STEP # 01</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Input</strong></td>
<td>XXX</td>
</tr>
<tr>
<td><strong>Expected Output</strong></td>
<td>(XXX)</td>
</tr>
<tr>
<td><strong>Normal Loss</strong></td>
<td>XXX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>STEP # 02</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Actual Loss</strong></td>
<td>XXX</td>
</tr>
<tr>
<td><strong>Normal Loss</strong></td>
<td>(XXX)</td>
</tr>
<tr>
<td><strong>Abnormal Loss</strong></td>
<td>XXX</td>
</tr>
</tbody>
</table>

**DECISION RULE**

<table>
<thead>
<tr>
<th>Positive</th>
<th>Abnormal Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>Abnormal Gain</td>
</tr>
</tbody>
</table>

14. **Abnormal Loss Account**

- Abnormal loss is not expected and should not happen. It therefore makes sense to give it a cost.
- Total loss = Normal loss + Abnormal loss.
- Units of abnormal loss are given a cost. If it is assumed that all losses in process occur at the end of the process, units of abnormal loss are costed in exactly the same way in the as units of finished output.
- The cost of units of abnormal loss is treated as an expense for the period, and charged as an expense in the income statement for the period.
- Normal loss has no value/cost, abnormal loss has a cost.
Scrap value treatment of abnormal loss.

- The cost of expected units of output is calculated in the usual way. In the WIP account the cost of abnormal loss = units of abnormal loss × cost per expected unit of output.
- The scrap value of abnormal loss is set off against the cost of abnormal loss in the abnormal loss account, not the process account (WIP).
  Debit: Cash (= scrap value: money from sale of the scrapped units)
  Credit: Abnormal loss account (abnormal loss units × scrap value per unit)
- The net cost of abnormal loss (= cost of abnormal loss minus its scrap value) is then transferred as a cost to the cost accounting income statement at the end of the accounting period.

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Qty</th>
<th>Amount Rs.</th>
<th>Particulars</th>
<th>Qty</th>
<th>Amount Rs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Account</td>
<td>XXX</td>
<td>XXX</td>
<td>Scrap Account (units * scrap value)</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Profit &amp; Loss Account</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td>XXX</td>
<td>XXX</td>
</tr>
</tbody>
</table>

### 15. Abnormal Gain Account

- Actual loss = Normal loss – Abnormal gain
- The differences between costing for abnormal loss and costing for abnormal gain are that:
  - Abnormal gain is a benefit rather than a cost: whereas abnormal loss is written off as a cost at the end of the financial period, abnormal gain is an adjustment that increases the profit for the period.
  - Abnormal gain is recorded as a debit entry in the process account, because it is a benefit.
  - The other half of the double entry is recorded in an abnormal gain account. At the end of the period, the balance on the abnormal gain account is then transferred to the income statement as a benefit for the period, adding to profit.
- When loss has a scrap value, the value of abnormal gain is actually less than the amount shown in the WIP account. This is because actual revenue from scrap will be less than the expected revenue, due to the fact that actual loss is less than the expected loss.
- Accounting for the scrap value of abnormal gain is similar to accounting for the scrap value of abnormal loss.
  - In the process account (WIP), abnormal gain is valued at the cost per expected unit of output.
  - The scrap value of normal loss is normal loss units × scrap value per unit.
The scrap value of abnormal gain is the scrap revenue that has been ‘lost’ because actual loss is less than expected loss. This is abnormal gain units × scrap value per unit.

The scrap value of abnormal gain is recorded as a debit entry in the abnormal gain account (in a similar way to recoding the scrap value of abnormal loss as a credit entry in the abnormal loss account).

The scrap value of the abnormal gain is set off against the value of the abnormal gain in the abnormal gain account, not the process account.

The balance on the abnormal gain account is the net value of abnormal gain (= value of abnormal gain minus the scrap value not earned). This balance is transferred as a net benefit to the cost accounting income statement at the end of the accounting period.

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Qty</th>
<th>Amount</th>
<th>Particulars</th>
<th>Qty</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scrap Account (units * scrap value)</td>
<td>XXX</td>
<td>XXX</td>
<td>Process Account</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Profit &amp; Loss Account</td>
<td>XXX</td>
<td>XXX</td>
<td>TOTAL</td>
<td></td>
<td>XXX</td>
</tr>
</tbody>
</table>
# COST OF PRODUCTION REPORT - AMERICAN APPROACH

## QUANTITY SCHEDULE:

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units Started/put into process</td>
<td>XXX</td>
</tr>
<tr>
<td>Units added</td>
<td>XXX</td>
</tr>
<tr>
<td>Units received from last deptt</td>
<td>XXX XXX</td>
</tr>
<tr>
<td>Units transferred to next deptt</td>
<td>XXX</td>
</tr>
<tr>
<td>Units Completed in deptt</td>
<td>XXX</td>
</tr>
<tr>
<td>Abnormal Loss</td>
<td>XXX</td>
</tr>
<tr>
<td>Normal loss at the end</td>
<td>XXX XXX</td>
</tr>
</tbody>
</table>

## COST CHARGED BY THE DEPTT:

### Cost of preceding deptt:

<table>
<thead>
<tr>
<th>Description</th>
<th>Total Cost</th>
<th>Unit Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of WIP Opening inventory</td>
<td>(Open WIP Units : XXX)</td>
<td></td>
</tr>
<tr>
<td>Cost of previous deptt</td>
<td>(Last deptt Units : XXX)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Total Units : XXX)</td>
<td>XXX (W-1)</td>
</tr>
</tbody>
</table>

### Cost added by the deptt:

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost added during month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material</td>
<td>XXX XXX</td>
</tr>
<tr>
<td>Direct Labor</td>
<td>XXX XXX</td>
</tr>
<tr>
<td>Factory Overhead</td>
<td>XXX XXX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost of Opening WIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material</td>
<td>XXX XXX</td>
</tr>
<tr>
<td>Direct Labor</td>
<td>XXX XXX</td>
</tr>
<tr>
<td>Factory Overhead</td>
<td>XXX XXX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Total Cost Added by the deptt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>XXX XXX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Adjustment of normal loss units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>XXX XXX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Total Cost To Be Accounted For</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>XXX XXX</td>
</tr>
</tbody>
</table>

## TOTAL COST ACCOUNTED FOR AS FOLLOWS:

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost of goods transferred</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>XXX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost of preceding deptt/Adjusted Cost of last deptt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>XXX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Closing WIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material</td>
<td>XXX</td>
</tr>
<tr>
<td>Direct Labor</td>
<td>XXX</td>
</tr>
<tr>
<td>Factory Overhead</td>
<td>XXX XXX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Total Cost Accounted For</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>XXX</td>
</tr>
</tbody>
</table>
Notes:

1. Direct labor & factory overhead may be treated together as conversion cost.
2. **Normal loss types:**

<table>
<thead>
<tr>
<th></th>
<th>Start</th>
<th>During</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Not included in EPR</td>
<td>Not included in EPR</td>
<td>Included in EPR</td>
</tr>
</tbody>
</table>

3. There is no concept of Abnormal Loss in American system.
4. There is no concept of Abnormal Gain in American system.
5. Adjustment of normal loss units (2nd Deptt & Above)
   - \( \text{Unit loss} \times \text{unit cost of last deptt} \)
   - Good Units

6. Cost Per Unit:

   \[
   \text{Total cost} - \text{Normal Loss scrap value} / \text{EPR units}
   \]

7. Completion Stages for EPR as per **AMERICAN APPROACH**:

<table>
<thead>
<tr>
<th></th>
<th>Inspection %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Loss at the end</td>
<td>Inspection %</td>
</tr>
<tr>
<td>Abnormal Loss</td>
<td>Inspection %</td>
</tr>
<tr>
<td>Abnormal Gain</td>
<td>Inspection %</td>
</tr>
</tbody>
</table>
BY-PRODUCT

MAIN / JOINT PRODUCT:

When two or more products arise simultaneously in the course of processing, each of which has a significant sale value in relation to each other.

Joint product is a result of utilization of the same raw material and same processing operations. The processing of a particular raw material may result into the output of two or more products.

- All the products emerging from the manufacturing process are of the same economic importance. In other words, the sales value of those products may be more or less same and none of them can be termed as the major product.
- The products are produced intentionally which implies that the management of the concerned organization has intention to produce all the products.
- Some of joint products may require further processing or may be sold directly after the split off point.
- The manufacturing process and raw material requirement is common up to a certain stage of manufacturing. After the stage is crossed, further processing becomes different for each product. This stage is known as ‘split off’ point. The expenditure incurred up to the split off point is called as joint cost and the apportionment of the same to different products is the main objective of the joint product accounting.
- The management has little or no control over the relative quantities of the various products that will result.
- Joint products are commonly produced in industries like, chemicals, oil refining, mining, meatpacking, automobile etc. In oil refining, fuel, oil, petrol, diesel, kerosene, lubricating oil are few examples of the joint products.

BY PRODUCT:

A product which arises incidentally in the production of the main product & which has a relatively small sale value compared with the main product. Whatever revenue entity earns is the bonus for them.

- This term ‘by-products’ is sometimes used synonymously with the term ‘minor products’.
- The by-product is a secondary product, which incidentally results from the manufacture of a main product.
• By-products are also produced from the same raw material and same process operations but they are secondary results of operation. The main difference between the joint product and by-product is that there is no intention to produce the by-product while the joint products are produced intentionally. The relationship between the by-product and the main product changes with changes in economic or industrial conditions or with advancement of science.
• What was once a by-product of an industry may become a main product and one time main product may become a by-product subsequently. For example, during the Second World War, glycerin, a by-product in soap making was in such a demand that it became virtually the main product while the soap was reduced to the by-product.
• What is by-product of one industry may be a main product of another industry.
• Normally in continuous process industry, the by–products emerge. Some of the examples of by-products are given below:
  ▪ In sugar manufacturing, bagasse [residual of sugarcane after the juice is extracted], molasses [residual of sugarcane juice after the impurities are taken out] and press mud are the three by-products, which emerge at different stages of manufacturing.
  ▪ In cotton textile, the cotton-seed, which is taken out before the manufacturing process, is a by-product.

Split off point: Split off point also called separation point consists of all the costs incurred prior to separation point.

This is a point up to which, input factors are commonly used for production of multiple products, which can be either joint products or by-products. After this point, the joint products or byproducts gain individual identity. In other words, up to a certain stage, the manufacturing process is the same for all the products and a stage comes after which, the individual processing becomes different and distinct. For example, in a dairy, several products like, milk, ghee, butter, milk powder, ice-cream etc. may be produced. The common material is milk. The pasteurization of milk is a common process for all the products and after this process; each product has to be processed separately. All costs before split off point/ separation point is common cost or joint cost that is irrelevant for decision making purposes.

Joint Costs: Joint cost is the pre-separation cost of commonly used input factors for the production of multiple products. In other words, all costs incurred before or up to the split off point are termed as joint costs or pre separation costs and the apportionment of these costs is the main objective of joint product accounting. Costs incurred after the split off point are post separation costs and can be easily identified with the products.
ACCOUNTING FOR BY PRODUCT REVENUE

1. Income from by-product added to sales of the main product
2. By-Product income treated as a separate source of income
3. Sales income of the by-product deducted from the cost of production in the period
4. NRV of the by-product deducted from the cost of production in the period.

NRV METHOD:

Revenue by sale of by product \( XXX \)

Less-

Cost of further processing \( XXX \)

Cost of disposal \( XXX \) (XXX)

Net Realizable value \( XXX \)

NRV of the by-product is to be deducted from cost of production. In case of details working, to be deducted from cost of material & more specifically from the cost of material of previous cost.

NRV has same treatment as we did with normal loss in process costing. We will not assign cost to by-product as we not assign to normal loss. NRV of by-product produced (not sold) is to be taken to value the by-product in process costing.
Normal Loss | By-Product
--- | ---
Scrap value | NRV
Not assign cost | Not assign cost

**PER UNIT COST FORMULA:**

\[
\text{Total cost} - \text{scrap value of normal loss} - \text{NRV of by-product produced}
\]

Equivalent units – By-product

**Allocation of Joint Costs**

**MARKET VALUE/SALE VALUE METHOD**

\[
\frac{\text{Total joint product cost}}{\text{Total market cost}} \times 100 = \text{Answer} \times \text{each market value} = \text{apportionment of joint cost}
\]

The assumption behind this method is that the price obtained for an item is directly related to its cost.

**AVERAGE UNIT COST METHOD**

\[
\frac{\text{Total joint product cost}}{\text{Total number of unit produced}} \times 100 = \text{Answer} \times \text{quantity produced} = \text{apportionment of joint cost}
\]

**WEIGHTED AVERAGE METHOD**

\[
\frac{\text{Total joint product cost}}{\text{Total number of unit weight}} \times 100 = \text{Answer} \times \text{individual weight} = \text{apportionment of joint cost}
\]
NRV METHOD

Final sale value        XXX
Less- Subsequent processing costs      XXX
Joint cost              XXX

NOTE:

• It must be emphasized that whatever method is used for apportioning joint
costs, it is a convention only & its accuracy cannot be tested. It is totally
unsuitable for any form of decision making.
• The amount of joint cost & the method by which joint costs are apportioned are
irrelevant.

JOINT VS BY PRODUCT:

<table>
<thead>
<tr>
<th>DIFFERENCE</th>
<th>JOINT PRODUCT</th>
<th>BY PRODUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SALE VALUE</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>FURTHER PROCESS</td>
<td>After spit off point</td>
<td>Not economical</td>
</tr>
<tr>
<td>ACCOUNTING</td>
<td>Allocate on various bases</td>
<td>Many Methods</td>
</tr>
<tr>
<td>INTENTION TO PRODUCE</td>
<td>Intentionally</td>
<td>No intention</td>
</tr>
</tbody>
</table>

DECISION MAKING POINT:

1. Joint cost is irrelevant for decision making.
2. Loss on individual joint product is irrelevant. The key to decision is that
process as a whole is profitable.
3. Method:
   Incremental Revenue = XXX
   Incremental Costs = XXX
   Incremental Profit = XXX
DECISION MAKING

HOW TO ATTEMPT DECISION MAKING QUESTION
FOR TWO PRODUCTS

DETERMINING LIMITING FACTOR / RESOURCE:

<table>
<thead>
<tr>
<th>Demand * Per Unit scarce Hour</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less- Available hour</td>
<td>XXX</td>
</tr>
<tr>
<td>Shortfall (if positive)</td>
<td>XXX</td>
</tr>
</tbody>
</table>

NUMERICAL PORTION:

<table>
<thead>
<tr>
<th>Sale (Per Unit)</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less- Variable Expenses (Per Unit)</td>
<td>XXX</td>
</tr>
<tr>
<td>Contribution Margin (Per Unit)</td>
<td>XXX</td>
</tr>
<tr>
<td>÷</td>
<td>÷</td>
</tr>
<tr>
<td>Per Unit Scarce Hour</td>
<td>XXX</td>
</tr>
<tr>
<td>Contribution Margin (Per Scarce Hour)</td>
<td>XXX</td>
</tr>
</tbody>
</table>

RANKING (FORMULA = High to low depending on Contribution Margin (Per Scarce Hour))

DEMAND = demand * scarce hour

Allocate demand as per ranking obtained.

OPTIMUM PLAN:

<table>
<thead>
<tr>
<th>Demand * Contribution Margin per Unit</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand * Contribution Margin per Unit</td>
<td>XXX</td>
</tr>
<tr>
<td>Demand * Contribution Margin per Unit</td>
<td>XXX</td>
</tr>
</tbody>
</table>

TOTAL CONTRIBUTION XXX

NOTE: Unit contribution is not the correct way to decide priorities.
MORE THAN TWO PRODUCTS

DETERMINING LIMITING FACTOR / RESOURCE:

<table>
<thead>
<tr>
<th>Demand * Per Unit scarce Hour</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less- Available hour</td>
<td>XXX</td>
</tr>
<tr>
<td>Shortfall (if positive)</td>
<td>XXX</td>
</tr>
</tbody>
</table>

NUMERICAL PORTION:

Sale (Per Unit) XXX
Less- Variable Expenses (Per Unit) XXX
Contribution Margin (Per Unit) XXX

÷ ÷
Per Unit Scarce Hour XXX
Contribution Margin (Per Scarce Hour) XXX

RANKING (FORMULA = High to low depending on Contribution Margin (Per Scarce Hour))

DEMAND = demand * scarce hour

Allocate demand as per ranking obtained.

APPROPRIATE MIX:

<table>
<thead>
<tr>
<th>Demand * Scarce Hour</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand * Scarce Hour</td>
<td>XXX</td>
</tr>
<tr>
<td>Demand * Scarce Hour</td>
<td>XXX</td>
</tr>
</tbody>
</table>

TOTAL CONTRIBUTION XXX

MINIMUM DEMAND GIVEN

DETERMINING LIMITING FACTOR / RESOURCE:

<table>
<thead>
<tr>
<th>Demand * Per Unit scarce Hour</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less- Available hour</td>
<td>XXX</td>
</tr>
<tr>
<td>Shortfall (if positive)</td>
<td>XXX</td>
</tr>
</tbody>
</table>
NUMERICAL PORTION:

<table>
<thead>
<tr>
<th></th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale (Per Unit)</td>
<td></td>
</tr>
<tr>
<td>Less- Variable Expenses (Per Unit)</td>
<td></td>
</tr>
<tr>
<td>Contribution Margin (Per Unit)</td>
<td>[XX]</td>
</tr>
<tr>
<td>÷</td>
<td></td>
</tr>
<tr>
<td>Per Unit Scarce Hour</td>
<td>XXX</td>
</tr>
<tr>
<td>Contribution Margin (Per Scarce Hour)</td>
<td>XXX</td>
</tr>
</tbody>
</table>

RANKING (FORMULA = High to low depending on Contribution Margin (Per Scarce Hour))

DEMAND = demand * scarce hour

Allocate demand as per ranking obtained.

APPROPRIATE MIX:

<table>
<thead>
<tr>
<th>Demand * Scarce Hour</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand * Scarce Hour</td>
<td>XXX</td>
</tr>
<tr>
<td>Demand * Scarce Hour</td>
<td>XXX</td>
</tr>
<tr>
<td>TOTAL CONTRIBUTION</td>
<td>XXX</td>
</tr>
<tr>
<td>Total Demand -- Minimum Demand * Scarce Hour</td>
<td>XXX</td>
</tr>
<tr>
<td>Total Demand -- Minimum Demand * Scarce Hour</td>
<td>XXX</td>
</tr>
<tr>
<td>TOTAL CONTRIBUTION</td>
<td>XXX</td>
</tr>
</tbody>
</table>

HOW MUCH TO BUY -- FORMAT

<table>
<thead>
<tr>
<th>Available Mix</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>A – (Demand * Limiting factor)</td>
<td>[XX]</td>
</tr>
<tr>
<td></td>
<td>XXX</td>
</tr>
<tr>
<td>B – (Demand * Limiting factor)</td>
<td>[XX]</td>
</tr>
<tr>
<td></td>
<td>XXX</td>
</tr>
<tr>
<td>C – (Demand * Limiting factor)</td>
<td>[XX]</td>
</tr>
<tr>
<td>Balance</td>
<td>XXX</td>
</tr>
</tbody>
</table>

If Demand of C is (Balance of B / Limiting factor of C) OR Demand is in less of what we need, then unit bought will be calculates as follows:

| Total Demand of C    | XXX |
| Demand of C          | \[XX\] |
| Units Bought         | XXX |
ILLUSTRATION TO ABOVE FORMULA:

<table>
<thead>
<tr>
<th></th>
<th>Pentagon</th>
<th>Hexagon</th>
<th>Octagon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine time per unit (Hours) – Limiting factor</td>
<td>4</td>
<td>2.5</td>
<td>3</td>
</tr>
<tr>
<td>Ranking</td>
<td>3rd</td>
<td>2nd</td>
<td>1st</td>
</tr>
<tr>
<td>Estimated demand (Units)</td>
<td>10000</td>
<td>20000</td>
<td>9000</td>
</tr>
<tr>
<td>Available Hours</td>
<td></td>
<td></td>
<td>100000</td>
</tr>
</tbody>
</table>

SOLUTION TO ABOVE FORMULA:

|                | Available Mix | A – (9000 * 3) | B – (20000 * 2.5) | C – (5750 * 4) | Balance | NIL |
|----------------|---------------|----------------|------------------|--------------|---------|
|                | 100000        | (27000)        | (50000)          | (23000)      |         |
| Total Demand of C |                | 100000        |                  |              |         |
| Demand of C     | (5750)        |                |                  |              |         |
| Units Bought    |               | 4250           |                  |              |         |

In above case, we divide 23000 hrs (Balance of B) to 4 (limiting factor) to get 5750 hrs, unit bought will be as follows:

RELEVANT COST

1. Five Vital **Criteria**:

   a. Bearing on the future. (Relate, incur & "与发展") They cannot include any costs that have already occurred in the past.
   b. Differ among the alternatives. (also called differential cost)
   c. Relevant costs of a decision are **costs that will occur as a direct consequence of making the decision**.
   d. Relevant costs are cash flows. Notional costs, such as depreciation charges, notional interest costs and absorbed fixed costs cannot be relevant to a decision.
   e. The concept of relevant costs also applies to revenue (i.e. the changes in cash revenue arising as a direct consequence of a decision).

2. Scrap Sale Proceed as it is expected future inflow that usually differs among alternatives.
4. Avoidable Cost.
5. Depreciation on new equipment that is to be purchased.
6. Future Cost that differ between alternatives.
7. Variable Overhead.
8. Additional Cost.
10. Incremental cost that could be avoided if contract not undertaken. Provided that this additional cost is a cash flow.
11. Differential cost provided that this additional cost is a cash flow.
12. Relevant cost & revenue are those that are affected by change in level of activity.
13. Directly attributable fixed cost that although fixed are relevant to decision:
14. Increase if certain extra activities are undertaken.
15. Decrease or eliminated entirely if a decision were taken either to reduce the scale of operation or shut down entirely.

**IRRELEVANT COST**

1. Book value as it is past / historical cost. Book Value is irrelevant even if income taxes are considered. Book Value is essential information for predicting the amount & timing of future tax cash flows, but, by itself, the book value is irrelevant.
2. Depreciation on old equipment as it is past cost. Historical cost depreciation that has been calculated in the conventional manner. Such depreciation calculations do not result in any future cash flows. They are merely the book entries that are designed to spread the original cost of an asset over its useful life.
3. Fixed cost is irrelevant. Fixed overheads that will not increase or decrease as a result of the decision being taken. If the actual amount of overhead incurred by the company will not alter, then the overhead is not a relevant cost. This is true even if the amount of overhead to be absorbed by a particular cost unit alters as a result of the company’s cost accounting procedures for overheads.
4. Unitized fixed cost.
5. Discretionary cost is fixed cost.
6. Allocated/Absorbed/General overhead.
7. Unavoidable Cost because the decision will not affect the cost in any way.
8. Sunk / Past Cost. (Water under the bridges—do not affect the future).
9. Original cost is irrelevant.
10. Estimation cost is past cost.
11. Administration overhead, estimating & design department cost is sunk cost.
12. Future Cost that don’t differ between alternatives. Even among future costs, those variable costs which will not differ under various alternatives are irrelevant. For example, a company proposes to re-arrange plant facilities and estimates its future cost under two alternative choices, as under:
In the above example, the direct material cost remains constant under both the alternatives, hence it is irrelevant to the decision “as to whether plant facilities are to be re-arranged or not”. Only direct labour cost which differs under the two alternatives is relevant. Since there is a saving of Re. 1 per unit in the second alternative, the company is advised to go in for re-arrangement of plant facilities.

13. Cost of material in stock / component no longer used in production process.
14. Re-allocation of existing overhead is irrelevant for decision making purposes.
15. Committed cost. Expenditure that will be incurred in the future, but as a result of decisions taken in the past that cannot now be changed. These are known as committed costs. They can sometimes cause confusion because they are future costs. However, a committed cost will be incurred regardless of the decision being taken and therefore it is not relevant. An example of this type of cost could be expenditure on special packaging for a new product, where the packaging has been ordered and delivered but not yet paid for. The company is obliged to pay for the packaging even if they decide not to proceed with the product; therefore it is not a relevant cost.

**Exercise**
Test your understanding of relevant and non-relevant costs by seeing if you can identify which of the following costs are relevant:
(a) The salary to be paid to a market researcher who will oversee the development of a new product. This is a new post to be created specially for the new product but the Rs: 12,000 salaries will be a fixed cost. Is this cost relevant to the decision to proceed with the development of the product?
(b) The Rs: 2,500 additional monthly running costs of a new machine to be purchased to manufacture an established product. Since the new machine will save on labour time, the fixed overhead to be absorbed by the product will reduce by Rs: 100 per month. Are these costs relevant to the decision to purchase the new machine?
(c) Office cleaning expenses of Rs: 125 for next month. The office is cleaned by contractors and the contract can be cancelled by giving one month’s notice. Is this cost relevant to a decision to close the office?
(d) Expenses of Rs: 75 paid to the marketing manager. This was to reimburse the manager for the cost of travelling to meet a client with whom the company is currently
negotiating a major contract. Is this cost relevant to the decision to continue negotiations?

**Solution**

(a) The salary is a relevant cost of Rs: 12,000. Do not be fooled by the mention of the fact that it is a fixed cost, it is a cost that is relevant to the decision to proceed with the future development of the new product. This is an example of a directly attributable fixed cost. A directly attributable fixed cost may also be called a product-specific fixed cost.

(b) The Rs: 2,500 additional running costs are relevant to the decision to purchase the new machine. The saving in overhead absorption is not relevant since we are not told that the total overhead expenditure will be altered. The saving in labour cost would be relevant but we shall assume that this has been accounted for in determining the additional monthly running costs.

(c) This is not a relevant cost for next month since it will be incurred even if the contract is cancelled today. If a decision is being made to close the office, this cost cannot be included as a saving to be made next month. However, it will be saved in the months after that so it will become a relevant cost saving from month 2 onwards.

(d) This is not a relevant cost of the decision to continue with the contract. The Rs: 75 is sunk and cannot be recovered even if the company does not proceed with the negotiations.

**NOTIONAL COST**

The value of benefit where no actual cost is incurred. There is no actual outflow of cash. Notional costs such as notional rent and notional interest. These are only relevant if they represent an identified lost opportunity to use the premises or the finance for some alternative purpose. In these circumstances, the notional costs would be opportunity costs.

**POINTS TO CONSIDER IN CLOSE OF BUSINESS**

1. Difficult to recapture market due to heavy advertising expenses.
2. Fear of retrenchment of worker.
3. Loss to reputation of business.
4. Temporary close down is not good if relationship with supplier adversely affected in any way.
5. Fear of non-collection of dues.
6. Plant become obsolete & heavy capital expenditure needed to restart the business.
CONTINUE PRODUCTION IF SALE PRICE IS BELOW MARGINAL COST

1. Introducing new product.
2. Exploring foreign market.
3. Purchase of large quantity of material.
4. Eliminate competitor.
5. Perishable nature of goods.
6. Employee cannot be retrenched.
7. Sale of one product at below marginal cost pushes up sale of other product.

DECISION MAKING TIPS

1. In heavy demand → High C/M ratio will earn high profit due to high contribution.
2. In Low demand → Low Break Even Point means high profit as it starts earning profit at low level of sales.
3. Don’t eliminate the product if the contribution is positive.
4. Don’t accept order from local market if price is below sale price as it will affect the relationship.
5. To foreigner, it should be accepted if price is below sale price.
6. Cost that is relevant in one situation might be irrelevant in other situation.

MAKE OR BUY / OUTSOURCING

It is the process of obtaining good/service by outside supplier.

<table>
<thead>
<tr>
<th>Revenue</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less- Cost</td>
<td>XXX</td>
</tr>
<tr>
<td>Savings</td>
<td>XXX</td>
</tr>
<tr>
<td>Avoidable cost</td>
<td>XXX</td>
</tr>
</tbody>
</table>

UTILISATION OF STORAGE CAPACITY

Accept orders if these questions are replied in “Yes”:

1. Spare capacity available.
2. Contribution is positive.

| Incremental Revenue | XXX |
| Incremental Cost | XXX |
| Incremental Contribution | XXX |
**REVELANT RANGE OF ACTIVITY**

Range within which unit price are likely to be constant.

1. Step is large.
2. Step is small. Reason is that cost is variable cost.

In short term, cost is fixed which become variable with the passage of time.

**ACCEPT OR REJECT**

| Sale price > variable manufacturing cost | Accept order. |
| Sale price < variable manufacturing cost | Reject order. |

Here, variable manufacturing cost means:

<table>
<thead>
<tr>
<th>Variable manufacturing cost</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add-- Opportunity Cost</td>
<td>XXX</td>
</tr>
<tr>
<td>Less—Savings</td>
<td>XXX</td>
</tr>
<tr>
<td>TOTAL</td>
<td>XXX</td>
</tr>
</tbody>
</table>

**MAKE OR BUY**

- Variable manufacturing cost > Buy cost → Buy.
- Variable manufacturing cost < Buy cost → Make.

**MAXIMUM PRICE**

- Variable manufacturing cost.

**OPPORTUNITY COST**

- The maximum available contribution to profit forgone (or passed up / loss of revenue) by using limited resources for particular purposes. This cost will never appear in the set of double entry cost accounts.

The best way to demonstrate opportunity costs is to consider some examples:

(a) A company has some obsolete material in stock that it is considering using for a special contract. If the material is not used on the contract it can either be sold back to the supplier for Rs: 2 per tonne or it can be used on another contract in place of a different material that would usually cost Rs: 2.20 per tonne. The opportunity cost of using the material on the special contract is Rs: 2.20 per tonne. This is the value of the next best alternative use for the material, or the benefit forgone by not using it for the other contract.
(b) C is deciding whether or not to take a skiing holiday this year. The travel agent is quoting an all-inclusive holiday cost of Rs: 675 for a week. C will lose the chance to earn Rs: 200 for a part-time job during the week that the holiday would be taken. The relevant cost of taking the holiday is Rs: 875. This is made up of the out-of-pocket cost of Rs: 675, plus the Rs: 200 opportunity cost that is the part-time wages forgone.

**NOTIONAL COSTS AND OPPORTUNITY COSTS**

Notional costs and opportunity costs are in fact very similar. This is particularly noticeable in the case of notional rent. The notional rent could be the rental that the company is forgoing by occupying the premises itself, i.e. it could be an opportunity cost. However, it is only a true opportunity cost if the company can actually identify a forgone opportunity to rent the premises. If nobody is willing to pay the rent, then it is not an opportunity cost.

**INCREMENTAL COST:** Increase of output due to change in cost result in change in activity level. Also called Differential Cost.

**DECREMENT COST:** A differential cost is therefore an amount by which future costs will be higher or lower, if a particular course of action is chosen.

**OUT OF POCKET EXPENSES:** Those costs that entail current or near future outlays for the decision at hand. E.g the business man can either use his car to attend meeting at cost of Rs: 25/- or he can drive to the station (cost Rs: 1/-) & let the train take the train at cost of Rs: 20/-. The out of pocket expense is the additional cash expense of Rs: 51-25 = 26.

**SUNK COST:** Money already spent that cannot now be recovered. More specifically “water under the bridges” OR “bygones are bygones”. An example of a sunk cost is expenditure that has been incurred in developing a new product. The money cannot be recovered even if a decision is taken to abandon any further development of the product. The cost is therefore not relevant to future decisions concerning the product.

**DIRECTLY ATTRIBUTABLE FC:** This cost has two features:

- Increase if certain extra activities were undertaken.
- Decrease or be eliminated entirely if a decision were taken either to reduce the scale of operations or shut down entirely.
SCARCE RESOURCE / LIMITING FACTOR

Anything that limits the activity of an entity is called limiting factor. E.g:

1. Demand
2. Material
3. Labor hour
4. Machine hour

<table>
<thead>
<tr>
<th>No Limiting Factor</th>
<th>High CM ratio is good.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limiting Factor</td>
<td>High contribution per scarce resource is good.</td>
</tr>
</tbody>
</table>

INCREMENTAL ANALYSIS

Incremental analysis considers only that item of revenue, cost & volume that will change if new program is implemented.

<table>
<thead>
<tr>
<th>Expected C/M (Expected sale * C/M ratio)</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous C/M (Old sale * C/M ratio)</td>
<td>XXX</td>
</tr>
<tr>
<td>Increased C/M</td>
<td>XXX</td>
</tr>
<tr>
<td>Less- Additional Sales</td>
<td>XXX</td>
</tr>
<tr>
<td>Increased Net Operating Income</td>
<td>XXX</td>
</tr>
</tbody>
</table>
### Same C/M per Limiting Factor

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM (Per limiting factor)</td>
<td>48</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Ranking</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

1. When there is same contribution margin per limiting factor, firm is indifferent in that case.
2. Product mix is irrelevant here.
3. Whatever product entity made, it never matters.
SPECIAL ORDER

CASE # 1: Quantity is not same but VC per unit is same, then we will get total cost by this formula: quantity * VC per unit

<table>
<thead>
<tr>
<th>Qty</th>
<th>A</th>
<th>B</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
<td>300</td>
<td>400</td>
</tr>
<tr>
<td>VC Per unit</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total VC</td>
<td>300</td>
<td>900</td>
<td>1200</td>
</tr>
</tbody>
</table>

CASE # 2: Quantity is same but VC per unit is not same, then we will get total cost by this formula: quantity * VC per unit

<table>
<thead>
<tr>
<th>Qty</th>
<th>A</th>
<th>B</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200</td>
<td>200</td>
<td>400</td>
</tr>
<tr>
<td>VC Per unit</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Total VC</td>
<td>400</td>
<td>600</td>
<td>1000</td>
</tr>
</tbody>
</table>

CASE # 3: Quantity is not same & VC per unit is also not same, then we will get total cost by this formula: weighted average cost

<table>
<thead>
<tr>
<th>Qty</th>
<th>A</th>
<th>B</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>300</td>
<td>500</td>
<td>800</td>
</tr>
<tr>
<td>VC Per unit</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Total VC</td>
<td>300</td>
<td>2000</td>
<td>2300</td>
</tr>
</tbody>
</table>
WHEN TO USE WEIGHTED AVERAGE RATIO

1. Quantity is different & cost is different, total cost will be distributed by weighted average cost.
2. Total cost & break up not given, calculated weighted average ratio.
3. More than one ratio given for calculating cost, use weighted average ratio.

ILLUSTRATION TO ABOVE CONCEPT # 01:

<table>
<thead>
<tr>
<th>Total Variable Cost</th>
<th>836000</th>
</tr>
</thead>
<tbody>
<tr>
<td>VC Ratio</td>
<td>1</td>
</tr>
<tr>
<td>Units</td>
<td>15000</td>
</tr>
</tbody>
</table>

SOLUTION TO ABOVE ILLUSTRATION # 01:

| Qty Ratio | 1.5 | 1 | 1 |
| VC Ratio  | 1   | 1.5 | 1.75 |
| Weighted Average | 1.5 | 1.5 | 1.75 |

VC per unit: 264000/15000 = 17.6
264000/10000=26.4
308000/10000=30.8

ILLUSTRATION TO ABOVE CONCEPT # 02:

Firm convert into company on 01-05-09. Financial year ends on 31st dec, 2011

Pre incorporate sale = Rs: 300000
Post incorporate sale = Rs: 900000
COGS = Rs: 800000

No change in sales but COGS reduces by 10% in post incorporation period.

Required: Pre & Post incorporation period.

SOLUTION TO ABOVE ILLUSTRATION # 02:

<table>
<thead>
<tr>
<th></th>
<th>Pre</th>
<th>Post</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>300000</td>
<td>900000</td>
<td>1200000</td>
</tr>
<tr>
<td>COGS</td>
<td>(216216)</td>
<td>(583783)</td>
<td>(800000)</td>
</tr>
<tr>
<td>Gross Profit</td>
<td>83784</td>
<td>316217</td>
<td>400000</td>
</tr>
<tr>
<td>Gross Profit (%)</td>
<td>27.93%</td>
<td>35.13%</td>
<td></td>
</tr>
</tbody>
</table>
Weighted average is calculated as follows -

<table>
<thead>
<tr>
<th>Qty</th>
<th>VC</th>
<th>9 (1-10%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>3</td>
<td>8.1</td>
<td></td>
</tr>
</tbody>
</table>

**EIGHT CORE CONCEPTS OF DECISION MAKING**

1. **MINIMUM PROFIT**
   - It is to be ignored as it is irrelevant cost.

2. **COST OF TENDER & FEASIBILITY STUDY**
   - Irrelevant for decision making as it is common cost which is to be paid regardless of acceptance or rejection.

3. **FOH**
   - Variable FOH = Always relevant
   - Fixed/Absorbed/Allocated/Apportioned FOH = Always irrelevant

**FIXED COSTS:**

1. **Change as a decision**
   - Increase in fixed costs is incremental cost & is relevant for decision.
2. **Not change as a decision**
   - Irrelevant for decision. Fixed costs are ignored as there is no incremental fixed costs expenditure.
4. **LABOR - 1**

- **Labor**
  - **Variable Cost**
    - (No of hr * per hr rate)
  - **Committed Cost**
    - 1 - Irrelevant up to committed level
    - 2 - Relevant over & above that level
  - **Shift in Labor**
    - 1 - Variable Cost
    - 2 - Opportunity Cost (No of hr * per hr contribution)

---

**LABOR - 2**

- **Labor - 2**
  - **Full Capacity**
    - Additional work cannot be done/undertaken
  - **Spare Capacity**
    - Additional work can be done/undertaken
  - **Hire Staff**
    - Current Pay
    - 1 - Variable Expense
    - 2 - Lost Contribution
  - **Not Hire Staff**
    - NIL Relevant Cost
5. **MATERIAL**

### Regular Use

- **Raw Material bought for regular use** = Current replacement Price
- **Raw Material not bought for regular use** = Loss of contribution margin of regular use

### Non-Regular Use / Non-Alternative Use / Non-Replacement

- Have no resale value
- Have some value OR resale value
- No resale value OR other use

### Raw Material Already Purchased

- **Resale Value**
- **Higher of other value OR resale value**
- **ZERO**

### No Regular / Alternative Use

- **Scrap Value** = Loss of scrap value
- **No Scrap Value** = NIL
- **Cost of disposal** = Savings of cost of disposal (opportunity gain)

### Alternative Use

- **Higher of**
  - 1 – Scrap value
  - OR
  - 2 – Value in alternative use
6. **NON CURRENT ASSETS**

- Net book value/ written down value is not relevant for decision making as it is determined by accounting method & not by cash flow method.

7. **MACHINERY**

**ALREADY BOUGHT**

1. Fall in resale value is relevant (Before: 60000 > Now: 40000 = Difference of 20000 is relevant).
2. Running & Maintenance cost
3. Depreciation is irrelevant
4. Deprival value (Lower of Replacement cost OR Higher of NRV OR Value in Use)

**TO BE BOUGHT**

Following is relevant cost here:

1. Cost
2. Running & Maintenance cost
3. Depreciation
Depreciation is not relevant for decision making but using machinery will involve some incremental costs. These costs may be referred to as user costs & they include repair costs arising from use, hire charges & any fall in resale value of owned assets which result from their use.

8. **REQUIRED/AVAILABLE**

**CASE # 01**

<table>
<thead>
<tr>
<th>CRITERIA:</th>
<th>Required Unit = XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Required is more.</td>
<td></td>
</tr>
<tr>
<td>2 – Available is less.</td>
<td></td>
</tr>
<tr>
<td>3 – Regular uses</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Available Unit = (XXX) * current replacement price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance = XXX * current replacement price</td>
</tr>
</tbody>
</table>

**CASE # 02**

<table>
<thead>
<tr>
<th>CRITERIA:</th>
<th>Required Unit = XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Required is more.</td>
<td></td>
</tr>
<tr>
<td>2 – Available is less.</td>
<td></td>
</tr>
<tr>
<td>3 – Non - Regular uses</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Available Unit = (XXX) * disposal cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance = XXX * current replacement price</td>
</tr>
</tbody>
</table>

**CASE # 03**

<table>
<thead>
<tr>
<th>CRITERIA:</th>
<th>Required Unit * current replacement price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Required is less.</td>
<td></td>
</tr>
<tr>
<td>2 – Available is High.</td>
<td></td>
</tr>
<tr>
<td>3 – Regular uses</td>
<td></td>
</tr>
</tbody>
</table>

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
</table>
CASE # 04

**CRITERIA:**
1. Required is less.
2. Available is high.
3. Non-Regular uses

**Required Unit = XXX \times disposal cost**

CASE # 05

**CRITERIA:**

Required = Available.

**Required Unit = XXX**

OR

**Available Unit = XXX \times disposal cost**

CASE # 06

**CRITERIA:**
1. Required is more.
2. Available is none.
3. Will have to buy

**Full cost is relevant**

CASE # 07

**CRITERIA:**
1. Idle hour
2. Rate as per agreement

**ZERO relevant cost**
Substitute indicates that opportunity cost exists.
If two opportunity costs are given, then select the one with higher value.
Scarce Resource > Alternative use > Opportunity Cost

**Opportunity Cost formula**

Lower of Replacement cost **OR** Higher of NRV/Disposal Value **OR** Value in Use/ Economic Use

**TIPS**

- Ignore opening stock as we assume constant stock per level.
- Existence of spare capacity means ZERO RELEVANT COST.
- Full wage cost is irrelevant in short supply.

### Differential vs Incremental Costing

<table>
<thead>
<tr>
<th></th>
<th>Differential Costing</th>
<th>Incremental Costing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition</strong></td>
<td>Alternative course of action</td>
<td>Change in FC due to increase or decrease in output</td>
</tr>
<tr>
<td><strong>Approach</strong></td>
<td>Absorption / Marginal costing</td>
<td>Contribution</td>
</tr>
<tr>
<td><strong>Yard Stick</strong></td>
<td>Increase or Decrease in revenue</td>
<td>Contribution Margin</td>
</tr>
<tr>
<td><strong>Help</strong></td>
<td>Managerial &amp; non accounting decisions</td>
<td>All decisions. Both accounting &amp; non accounting</td>
</tr>
<tr>
<td><strong>Fixed Cost</strong></td>
<td>FC is not added</td>
<td>FC is added</td>
</tr>
</tbody>
</table>

**Questions for Practise**

**Question # 01**

IGI has been asked to prepare a tender for a contract to produce a special batch of 200 paints to be completed by December 31st. You have obtained the following information:

1. Each paint required:
   - Material: 4 kg of A
   - 5 kg of B
   - Labor: 2 hrs for skilled
   - 3 hrs for semi skilled
2. 1000 kg of material A is in stock for which the company has paid Rs: 3 per kg. The price of this material has recently risen to Rs: 5 per kg & is expected to stay at that level for some time. The company uses the material regularly for its normal production.

3. Variable overhead are incurred at the rate of Rs: 4 per direct labor hour.

4. Fixed overhead are recovered at the rate of Rs: 6 per direct labor hour.

5. The cost of preparing the tender is Rs: 300.

6. Skilled workers are paid Rs: 7 per hour with a guaranteed weekly minimum of Rs: 245 per week. The work forces of 85 are only utilized for 30 hours per week.

7. Semi skilled workers are paid Rs: 5 per hour with time & a third for overtime. The workforces of 100 are currently fully utilized.

8. A special machine will have to be bought at a cost of Rs: 3000 which could subsequently be sold for Rs: 2500. Alternatively, the machine converted at a cost of Rs: 1000 & retained for use elsewhere in the business; the company has intended to buy an additional machine for this purpose towards the end of 20XX at a cost of Rs: 3700.

9. The company has 600 kg of material B in stock. It bought this sometime ago at a cost of Rs: 4000 but it currently is not in regular use by IGI. The current cost is Rs: 9 per kg. Material B could be used to make a different product in place of a material that has a current purchase price of Rs: 5 per kg (substitution on a 1:1 basis). There is none of this other material in stock.

**Solution # 01**

<table>
<thead>
<tr>
<th>Material</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1000</td>
<td>5000</td>
</tr>
<tr>
<td>A</td>
<td>600</td>
<td>3000</td>
</tr>
<tr>
<td>B</td>
<td>400</td>
<td>3600</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Labor =</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Skilled</td>
<td>(85 * 5)</td>
<td>425</td>
</tr>
<tr>
<td>Semi Skilled</td>
<td>(100 * 6.67)</td>
<td>667</td>
</tr>
<tr>
<td>Working</td>
<td>5 + 5 * 1/3 = 1.67 &lt; 5 + 1.67 = 6.67</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable Overhead :</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Skilled</td>
<td>(85*4)</td>
<td>340</td>
</tr>
<tr>
<td>Semi Skilled</td>
<td>(100*4)</td>
<td>400</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Machine =</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Outflow</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>Inflow</td>
<td>(2500)</td>
<td>500</td>
</tr>
<tr>
<td>Outflow</td>
<td>4000</td>
<td>(3000+1000)</td>
</tr>
<tr>
<td>Inflow</td>
<td>(3700)</td>
<td>300</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>14232</td>
</tr>
</tbody>
</table>

**Note:**

1. Fixed overhead are recovered at the rate of Rs: 6 per direct labor hour is IRRELEVANT for decision making.

2. The cost of preparing the tender is Rs: 300 are IRRELEVANT for decision making.
Question # 02

Mr. Bill Gates has been asked to quote a price for a special contract. He has recently prepared his tender but has asked you to review it for him.

He has pointed out to you that he wants to quote the minimum price as he believes this will lead to more lucrative work in the future. Mr. Bill Gates tender:

<table>
<thead>
<tr>
<th>Material:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A : 2000 kg @ Rs: 10 per kg</td>
<td>20000</td>
</tr>
<tr>
<td>B : 1000 kg @ Rs: 15 per kg</td>
<td>15000</td>
</tr>
<tr>
<td>C : 500 kg @ Rs: 40 per kg</td>
<td>20000</td>
</tr>
<tr>
<td>D : 50 liter @ Rs: 12 per liter</td>
<td>600</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Labor:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Skilled : 1000 hrs @ Rs: 25 per hr</td>
<td>25000</td>
</tr>
<tr>
<td>Semi - Skilled : 2000 hrs @ Rs: 15 per hr</td>
<td>30000</td>
</tr>
<tr>
<td>Un Skilled : 500 hrs @ Rs: 10 per hr</td>
<td>5000</td>
</tr>
</tbody>
</table>

| Fixed overhead : 3500 hrs @ Rs: 12 per hr | 42000 |

<table>
<thead>
<tr>
<th>Costs of preparing the tender:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Bill Gates time</td>
<td>1000</td>
</tr>
<tr>
<td>Other expenses</td>
<td>500</td>
</tr>
<tr>
<td>Minimum profit (5% of total costs)</td>
<td>7725</td>
</tr>
<tr>
<td>Minimum tender price</td>
<td>166825</td>
</tr>
</tbody>
</table>

Other information:

**Material – A:** 1000 kgs of this material is in stock of Rs: 5 per kg. Mr. Bill Gates has no alternative use for his material & intends selling it for Rs: 2 per kg. However, if he sold any he would have to pay a fixed sum of Rs: 300 to cover delivery costs. The current purchase price is Rs: 10 per kg.

**Material – B:** there is plenty of this material in stock at a cost of Rs: 18 per kg. The current purchase price has fallen to Rs: 15 per kg. This material is constantly used by Mr. Bill Gates in his business.

**Material – C:** the total amount in stock of Rs: 500 kgs was bought for Rs: 10000 some time ago for another one-off contract which never happened. Mr. Bill Gates is considering selling it for Rs: 6000 in total or using it as a substitute for another material constantly used in normal production. If used in this latter manner, it would save Rs: 8000 of the other material. Current purchase price is Rs: 40 per kg.

**Material – D:** there are 100 liters of this material in stock. It is dangerous & is not used in this contract, will have to be disposed of at a cost to Mr. Bill Gates of Rs: 50 per liter. The current purchase price is Rs: 12 per liter.

**Skilled Labor:** Mr. Bill Gates only hires skilled labor when he needs it. Rs: 25 per hour is the current hourly rate.

**Semi Skilled Labor:** Mr. Bill Gates has workforce of 50 semi skilled laborers who are not currently fully employed. They are on normal contracts & the number of spare hours currently available for this project.
is Rs: 1500. Any hours in excess of this will have to be paid for at time & a half. The normal hourly rate is Rs: 15 per hour.

**Un-skilled labor:** these are currently fully employed by Mr. Bill Gates on jobs where they produce a contribution of Rs: 2 per unskilled labor hour. Their current rate is Rs: 10 per hour, although extra could be hired at Rs: 20 an hour if necessary.

**Fixed Overhead:** this is considered by Mr. Bill Gates to be an accurate estimate of the hourly rate based on existing production.

**Costs of preparing the tender:** Mr. Bill Gates has spent 10 hours working on this project at Rs: 10 per hour, which he believes is his charge-out rate. Other expenses include the cost of travel & research spent by Mr. Bill Gates on the project.

**Profit:** this is Mr. Bill Gates minimum profit margin which he believes is necessary to cover “general day to day expenses of running a business”

### Solution # 02

<table>
<thead>
<tr>
<th>Material</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A : 1000 kg @ Rs: 10 per kg</td>
<td>10000</td>
</tr>
<tr>
<td>1000*2 = 2000 – 300 = 1700 &lt;Working – Rs: 300 are opportunity savings&gt;</td>
<td>1700</td>
</tr>
<tr>
<td>B : 1000 kg @ Rs: 15 per kg</td>
<td>15000</td>
</tr>
<tr>
<td>C : Higher of Rs: 6000/- OR Rs: 8000/-</td>
<td>8000</td>
</tr>
<tr>
<td>D : (50 * 50) &lt; opportunity savings&gt;</td>
<td>(2500)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Labor</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Skilled : 1000 hrs @ Rs: 25 per hr</td>
<td>25000</td>
</tr>
<tr>
<td>Semi - Skilled :</td>
<td>11250</td>
</tr>
<tr>
<td>Required = 2000</td>
<td></td>
</tr>
<tr>
<td>Available = (1500)</td>
<td></td>
</tr>
<tr>
<td>Shortfall = 500 (500 * 22.50)</td>
<td></td>
</tr>
<tr>
<td>Working – overtime of Rs: 22.50 (15+50%) will always be paid at premium.</td>
<td></td>
</tr>
<tr>
<td>Un Skilled : (500 * 2 = 1000) &amp; (10 * 500 = 5000) = (1000+5000 = 6000)</td>
<td>6000</td>
</tr>
<tr>
<td>Minimum Tender Price</td>
<td>74450</td>
</tr>
</tbody>
</table>

**Notes:**

1. Fixed Overhead : ZERO. IRRELEVANT for decision making.
2. Costs of preparing the tender : ZERO. IRRELEVANT for decision making.
3. Profit : ZERO. IRRELEVANT for decision making.

### Question # 03

Mr. Winston Churchill runs a business of manufacturing airplanes. He has recently completed a special custom built aeroplane for a customer who has become insolvent & is unable to take delivery.

Fortunately, the customer has paid a non-returnable deposit of Rs: 5000 on ordering the aeroplane & this money together with the cash proceed of Rs: 4000 now available for scrapping the aircraft will cover Mr. Winston Churchill costs.
Mr. Winston Churchill has suddenly met a new customer, BOB, who is interested in buying the aircraft but only after certain information. Bob wants to know how much the aeroplane will cost & has asked Mr. Winston Churchill to prepare a tender for them.

Mr. Winston Churchill has investigated the modifications required & prepared a costing statement:

<table>
<thead>
<tr>
<th>Material</th>
<th>Amount</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>A : 5 kg @ Rs: 100 per kg</td>
<td></td>
<td>500</td>
</tr>
<tr>
<td>B : 10 kg @ Rs: 150 per kg</td>
<td></td>
<td>1500</td>
</tr>
<tr>
<td>C : 10 kg @ Rs: 75 per kg</td>
<td></td>
<td>750</td>
</tr>
<tr>
<td>D : 7 kg @ Rs: 10 per kg</td>
<td></td>
<td>700</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Labor</th>
<th>Hours</th>
<th>Rate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skilled : 100 hrs @ Rs: 10 per hr</td>
<td></td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>Semi - Skilled : 75 hrs @ Rs: 7 per hr</td>
<td></td>
<td>525</td>
<td></td>
</tr>
<tr>
<td>Un Skilled : 80 hrs @ Rs: 5 per hr</td>
<td></td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Variable overhead : 255 hrs @ Rs: 3 per hr</td>
<td></td>
<td>765</td>
<td></td>
</tr>
<tr>
<td>Fixed overhead : 255 hrs @ Rs: 2 per hr</td>
<td></td>
<td>510</td>
<td></td>
</tr>
<tr>
<td>Costs of preparing the statement</td>
<td></td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Minimum tender price</td>
<td></td>
<td>6750</td>
<td></td>
</tr>
</tbody>
</table>

He is uncertain about the price at which to tender and has asked you to review his figures for a fee of Rs: 150. You establish the followings:

Material – A: there are 12 kg in stock originally purchased for Rs: 100 per kg. The price has recently risen to Rs: 130 per kg. Mr. Winston Churchill normally sells material for Rs: 120 per kg. Mr. Winston Churchill keeps stock of Material – A as it is essential component for all of his aeroplanes.

Material – B: the price of Rs: 150 per kg for material B also represent the historical cost of purchase of the 10 kg which are in stock. Mr. Winston Churchill normally sells material B to his customers as separate accessory. He has recently buying stocks at Rs: 160 per kg & selling them on for Rs: 20 per kg.

Material – C: this is no use elsewhere in the business although Mr. Winston Churchill has 4 kg in stock & could sell these for a total of Rs: 100. The price on the costing statement was the historical cost of purchase, which has not changed for some time.

Material – D: there are 20 kg of this in stock & these are of no use elsewhere in the business. It will be necessary to dispose of any remaining Material – D at a lump sum cost of Rs: 200.

Labor: skilled labor is paid on hourly basis at a rate shown in the statement above with a guaranteed minimum wage rate of Rs: 300 per week. Mr. Winston Churchill has 15 skilled workers, all of whom are working only 25 hours per week at present. Semi skilled labor is currently fully employed but could be diverted from a product which earns a contribution (after semi skilled labor) of Rs: 6 per semi skilled labor hour. Alternatively semi skilled labor could be hired at a cost of Rs: 20 per hour. Unskilled labor is hired on a causal basis. The contract will need to be completed in one week.

Overhead: the variable overhead recovery rate of Rs: 3 per labor hour worked were established by a detailed investigation of the business costs. The fixed overhead absorption rate of Rs: 2 per hour is designed to cover general overhead of the whole business of Rs: 210, the rent of workshop to carry out
the modification work of Rs: 100 & the hire of a special machine costing Rs: 200 needed to shape the components. Required = determine the minimum price to be tendered. Show all workings.

Solution # 03

<table>
<thead>
<tr>
<th>Material:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A : higher of Rs: 120/- OR Rs: 130/- = 130*5</td>
<td>650</td>
</tr>
<tr>
<td>B : higher of Rs: 200/- OR Rs: 160/- = 200*10</td>
<td>2000</td>
</tr>
<tr>
<td>C : (4*100 = 400) &amp; (6 *75 = 450) : &lt;400+450=950&gt;</td>
<td>950</td>
</tr>
<tr>
<td>D</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Labor:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Skilled : (25*10)</td>
<td>250</td>
</tr>
<tr>
<td>Semi - Skilled : (75<em>6 = 400 &amp; 75</em>7=525)</td>
<td>975</td>
</tr>
<tr>
<td>Working – lower of Rs: 1500 (75*20=1500) OR Rs: 975</td>
<td>975</td>
</tr>
<tr>
<td>Un Skilled : (80*5)</td>
<td>400</td>
</tr>
<tr>
<td>Variable overhead (225*3)</td>
<td>765</td>
</tr>
<tr>
<td>Rent of workshop for modification work</td>
<td>100</td>
</tr>
<tr>
<td>Cash proceeds</td>
<td>4000</td>
</tr>
<tr>
<td>Hire of special machine</td>
<td>200</td>
</tr>
<tr>
<td>Minimum Tender Price</td>
<td>10290</td>
</tr>
</tbody>
</table>

Question # 04

ABC Ltd is deciding whether or not to proceed with a special order. Use the details below to determine the relevant cost of the order.

(a) Materials P and Q will be used for the contract. 100 tonnes of material P will be needed and sufficient material is in stock because the material is in common use in the company. The original cost of the material in stock is Rs: 1 per tonne but it would cost Rs: 1.20 per tonne to replace if it is used for this contract. The material Q required is in stock as a result of previous over purchasing. This material originally cost Rs: 500 but it has no other use. The material is toxic and if it is not used on this contract, then ABC must pay Rs: 280 to have it disposed.

(b) The contract requires 200 hours of labour at Rs: 5 per hour. Employees possessing the necessary skills are currently employed by the company but they are idle at present due to a lull in the company’s normal business.

(c) Overhead will be absorbed by the contract at a rate of Rs: 10 per labour hour, which consists of Rs: 7 for fixed overhead and Rs: 3 for variable.

(d) The contract will require the use of a storage unit for three months. ABC is committed to rent the unit for one year at a rental of Rs: 50 per month. The unit is not in use at present. A neighbouring business has recently approached ABC offering to rent the unit from them for Rs: 70 per month.

(e) Total fixed overheads are not expected to increase as a result of the contract.

Solution # 04

(a) The relevant cost of a material that is used regularly is its replacement cost. Additional stocks of the material will need to be purchased for use in this contract. The relevant cost of material P
is therefore Rs: 1.20 per tonne. Material Q has a ‘negative’ cost if used for the contract. That is, there is a relevant saving made from not having to pay the disposal cost of Rs: 280.

(b) The relevant cost of labour is zero. The labour cost is being paid anyway and no extra cost will be incurred as a result of this contract.

(c) The fixed overhead is not relevant because we are told that fixed overheads are not expected to increase. The relevant variable overhead cost is: Rs: 3 per hour \* 200 hours = Rs: 600. Even if you are not specifically told that fixed overheads will remain unaltered, it is usual to assume that they will not increase, stating the assumption clearly.

(d) The rental cost of Rs: 50 per month is not relevant because it will not be affected by the contract. The relevant cost of using the storage unit is the forgone rental income of Rs: 70 per month.

Summary of relevant costs

| Material – P |    120 |
| Material -- Q |   (280) |
| Labour       |     0  |
| Variable overhead |  600 |
| Rent forgone  |    210 |
| **Total relevant cost** | **650** |

**Exercise: make or buy/outsourcing decision and accept/reject an order**

A company manufactures two models of a pocket calculator. The basic model sells for Rs: 5, has a direct material cost of Rs: 1.25 and requires 0.25 hours of labour time to produce. The other model, the Scientist, sells for Rs: 7.50, has a direct material cost of Rs: 1.63 and takes 0.375 hours to produce. Labour, which is paid at the rate of Rs: 6 per hour, is currently very scarce, while demand for the company’s calculators is heavy. The company is currently producing 8,000 of the basic model and 4,000 of the Scientist model per month, while fixed costs are Rs: 24,000 per month.

An overseas customer has offered the company a contract, worth Rs: 35,000, for a number of calculators made to its requirements. The estimating department has ascertained the following facts in respect of the work:

- The labour time for the contract would be 1,200 hours.
- The material cost would be Rs: 9,000 plus the cost of a particular component not normally used in the company’s models.
- These components could be purchased from a supplier for Rs: 2,500 or alternatively, they could be made internally for a material cost of Rs: 1,000 and an additional labour time of 150 hours.

**Requirement**

Advise the management as to the action they should take.

**Solution**

In view of its scarcity, labour is taken as the limiting factor. The decision on whether to make or buy the component has to be made before it can be decided whether or not to accept the contract. In order to do this the contribution per labour hour for normal production must first be calculated, as the contract will replace some normal production.
Normal products Basic Scientist

<table>
<thead>
<tr>
<th></th>
<th>Model - 1</th>
<th>Model - 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rs:</td>
<td>Rs:</td>
</tr>
<tr>
<td>Selling price</td>
<td>5.00</td>
<td>7.50</td>
</tr>
<tr>
<td>Materials</td>
<td>1.25</td>
<td>1.63</td>
</tr>
<tr>
<td>Labour</td>
<td>1.50</td>
<td>(2.75)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.88)</td>
</tr>
<tr>
<td>Contribution</td>
<td>2.25</td>
<td>3.62</td>
</tr>
<tr>
<td>÷</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limiting Factor</td>
<td>0.25</td>
<td>0.375</td>
</tr>
<tr>
<td>Contribution per direct labour hour</td>
<td>9.00</td>
<td>9.65</td>
</tr>
</tbody>
</table>

Therefore, if the company is to make the component it would be better to reduce production of the basic model, in order to accommodate the special order. The company should now compare the costs of making or buying the component. An opportunity cost arises due to the lost contribution on the basic model.

Special contract Manufacture of component

<table>
<thead>
<tr>
<th></th>
<th>Rs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>1,000</td>
</tr>
<tr>
<td>Labour</td>
<td>(Rs: 6 *150 hours) 900</td>
</tr>
<tr>
<td></td>
<td>(150 hours * Rs: 9.00) 1,350</td>
</tr>
<tr>
<td>Opportunity cost</td>
<td>3,250</td>
</tr>
</tbody>
</table>

Since this is higher than the bought-in price of Rs: 2,500 the company would be advised to buy the component from the supplier if they accept the contract. The contract can now be evaluated:

Contract contribution

<table>
<thead>
<tr>
<th></th>
<th>Rs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales revenue</td>
<td>35,000</td>
</tr>
<tr>
<td>Materials</td>
<td>9,000</td>
</tr>
<tr>
<td>Component</td>
<td>2,500</td>
</tr>
<tr>
<td>Labour (Rs: 6 * 1,200)</td>
<td>7,200</td>
</tr>
<tr>
<td></td>
<td>(18,700)</td>
</tr>
<tr>
<td>Contribution</td>
<td>16,300</td>
</tr>
<tr>
<td>Contribution per direct labour hour</td>
<td>13.58</td>
</tr>
</tbody>
</table>

Since the contribution is higher than either of the existing products, the company should accept the contract assuming this would not prejudice the market for existing products. As the customer is overseas this seems a reasonable assumption.

Because the contribution is higher for the Scientist model it would be wise to reduce production of the basic model. However, the hours spent on producing the basic model per month are 8,000 units * 0.25 hours = 2,000, and so the contract would displace more than a fortnight’s production of the basic model. The recommendation assumes that this can be done without harming long-term sales of the basic model.
Exercise: discontinuing a product

Wye plc makes and sells four products. The profit and loss statement for April is as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>W</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rs:</td>
<td>Rs:</td>
<td>Rs:</td>
<td>Rs:</td>
<td>Rs:</td>
</tr>
<tr>
<td>Sales</td>
<td>30,000</td>
<td>20,000</td>
<td>35,000</td>
<td>15,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Cost of sales</td>
<td>16,000</td>
<td>8,000</td>
<td>22,000</td>
<td>10,000</td>
<td>56,000</td>
</tr>
<tr>
<td>Gross profit</td>
<td>14,000</td>
<td>12,000</td>
<td>13,000</td>
<td>5,000</td>
<td>44,000</td>
</tr>
<tr>
<td>Overhead cost:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selling</td>
<td>8,000</td>
<td>7,000</td>
<td>8,500</td>
<td>6,500</td>
<td>30,000</td>
</tr>
<tr>
<td>Administration</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>8,000</td>
</tr>
<tr>
<td>Net profit</td>
<td>4,000</td>
<td>3,000</td>
<td>2,500</td>
<td>(3,500)</td>
<td>6,000</td>
</tr>
</tbody>
</table>

The management team is concerned about the results, particularly those of product Z, and it has been suggested that Wye plc would be better off if it ceased production of product Z. The production manager has said that if product Z was discontinued the resources which would become available could be used to increase production of product Y by 40 per cent. You have analyzed the cost structures of each of the products and discovered the following:

<table>
<thead>
<tr>
<th>Product</th>
<th>W</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rs:</td>
<td>Rs:</td>
<td>Rs:</td>
<td>Rs:</td>
<td>Rs:</td>
</tr>
<tr>
<td>Variable costs</td>
<td>4,800</td>
<td>1,600</td>
<td>13,200</td>
<td>5,000</td>
<td>24,600</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>11,200</td>
<td>6,400</td>
<td>8,800</td>
<td>5,000</td>
<td>31,400</td>
</tr>
<tr>
<td>Total</td>
<td>16,000</td>
<td>8,000</td>
<td>22,000</td>
<td>10,000</td>
<td>56,000</td>
</tr>
</tbody>
</table>

The total fixed costs figure includes Rs: 20,000 which is not specific to any one product, and which has been apportioned to each product on the basis of sales values. If the quantity of any product increases by more than 25 per cent, then the specific fixed production costs of the product will increase by 30 per cent.

The selling overhead comprises a fixed cost of Rs: 5,000 per product plus a variable cost which varies in proportion to sales value. The fixed cost is not specific to any product but the sales director believes that it should be shared equally by the four products.

The administration cost is a central overhead cost; it is not affected by the products made.

Requirements
(a) Prepare a statement which shows clearly the results of continuing to produce products W, X, Y and Z at the same volumes as were achieved in April. Present your statement in a format suitable for management decision-making.
(b) (i) Prepare a statement showing clearly the results if product Z is discontinued, and the number of units of Y is increased in accordance with the production manager’s statement. (Assume that no change in selling price per unit is necessary to sell the additional units.)
(ii) Reconcile the profit calculated in (a) and (b) (i) above; advice the management team as to whether product Z should be discontinued.
(c) Explain briefly any non-financial factors which should be considered before discontinuing a product.
Solution

(a) The profit statement needs to be restated in a marginal costing format if it is to be useful for decision-making.

<table>
<thead>
<tr>
<th>Product</th>
<th>W</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rs:</td>
<td>Rs:</td>
<td>Rs:</td>
<td>Rs:</td>
<td>Rs:</td>
</tr>
<tr>
<td>Sales</td>
<td>30,000</td>
<td>20,000</td>
<td>35,000</td>
<td>15,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Variable Cost of sales</td>
<td>4,800</td>
<td>1,600</td>
<td>13,200</td>
<td>5,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Variable selling overhead*</td>
<td>3,000</td>
<td>2,000</td>
<td>3,500</td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td>Contribution</td>
<td>22,200</td>
<td>16,400</td>
<td>18,300</td>
<td>8,500</td>
<td>54,400</td>
</tr>
<tr>
<td>Specific fixed costs (W1)</td>
<td>5,200</td>
<td>2,400</td>
<td>1,800</td>
<td>2,000</td>
<td>11,400</td>
</tr>
<tr>
<td>Net benefit</td>
<td>17,000</td>
<td>14,000</td>
<td>16,500</td>
<td>6,500</td>
<td>54,000</td>
</tr>
<tr>
<td>Non-specific fixed cost of sales</td>
<td>(20,000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed selling overhead (W2)</td>
<td>(20,000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administration costs</td>
<td>(8,000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net profit</td>
<td>6,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Total overhead less Rs: 5,000 fixed cost

Workings

1. | Product | W   | X   | Y   | Z   | Total |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rs:</td>
<td>Rs:</td>
<td>Rs:</td>
<td>Rs:</td>
<td>Rs:</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>11,200</td>
<td>6,400</td>
<td>8,800</td>
<td>5,000</td>
<td>31,400</td>
</tr>
<tr>
<td>Non-specific fixed cost*</td>
<td>6,000</td>
<td>4,000</td>
<td>7,000</td>
<td>3,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Specific fixed costs</td>
<td>5,200</td>
<td>2,400</td>
<td>1,800</td>
<td>2,000</td>
<td>11,400</td>
</tr>
</tbody>
</table>

*Given as Rs: 20,000 apportioned on the basis of sales values (3:2:3.5:1.5)

2. Rs: 5,000 per product *4 = Rs: 20,000

(b) (i) Z discontinued

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contribution from 40% additional sales of Y (Rs: 18,300 * 0.4)</td>
<td>7,320</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional specific fixed costs (Rs: 1,800 * 0.3)</td>
<td>(540)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of net benefit from Z</td>
<td>(6,500)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Net gain</strong></td>
<td><strong>280</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(ii) Profit reconciliation

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing profit</td>
<td>6,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discontinuation of Z</td>
<td>(6,500)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional contribution from Y</td>
<td>7,320</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional specific fixed costs</td>
<td>(540)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profit if Z is discontinued and sales of Y substituted</td>
<td><strong>6,280</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The company should therefore discontinue product Z and substitute production and sales of product Y in the proportions given. It should be noted, however, that the incremental gain is not significant and any errors in the estimates used could mean the wrong decision is taken.

(c) Non-financial factors to consider include:

- Possible redundancies among the workforce;
- Signals which it may give to competitors, who may perceive the company as being unwilling to support its products;
- The reaction of customers, particularly those who may recently have purchased the product.

Sometimes, even when management has made the decision to discontinue a product or activity, there is still a further decision to be made: when to discontinue it. The following exercise shows how such a decision could be made.

**Exercise: deciding when to close a department or factory**

It is possible that some costs are avoidable in the longer term but not in the short term. For instance, it may be necessary to give notice to cease renting a space occupied by a department. If the notice required is, say, three months then the rental is an unavoidable cost until the three months’ notice has expired. After that time it becomes an avoidable cost, as long as notice is given now.

The idea of costs being unavoidable in the short term adds a new dimension to our decision-making. Not only is it necessary to decide whether costs are inherently avoidable, but we may also need to determine when they will become avoidable.

In the very short term almost all costs are unavoidable. In the long term almost all costs are avoidable because the whole organization could be shut down completely. Here we are talking about time horizons in between these two extremes.
BUDGETING

Budgetary control

Use of budget to control organization activities.

Need for budgeting

- To set standards.
- To motivate managers.
- Performance evaluation
- To co-ordinate between different managers.
- To co-ordinate between different departments.

Master budget

Summary of company plan that sets specific target for sale, production, distribution & financing activities.

Responsibility accounting

Manager should be held responsible for those items that manager usually control to significant event or for any deviation.

Rolling/continual/perpetual budgeting

Twelve months budget that rolls forward one month as current month is completed. It shows current prices.

Human factor in Budgeting

Budget program will be succeeded if budget have complete acceptance & support of person who occupy key management positions. Top management should not use budget to blame/pressurize employees. Use of budget in such a negative way will breed hostility, tension, mistrust rather than cooperation & productivity.

Incremental approach budgeting

In this approach, previous year budget is a baseline. Past data is used to forecast future. Its biggest disadvantage is that anomalies have been transferred to future.

Zero base budgeting

Justify all budgeted expenditures before its inclusion in the budget. Its baseline is zero rather than last year budget. It requires considerable documentation. A more detailed approach & past mistakes can not be carried forward.

Estimate

Predetermination of future event either on simple guess or scientific principles.

Forecast

Assessment of probable future event.

Budget Padding

Underestimating revenue & over estimating cost.

Budget

Implication of a forecast & related to planned event.

Budgetary Slack

The difference between the revenue or cost projection that a person provides & a realistic estimate of the revenue or cost.

BUDGET VS FORECAST

<table>
<thead>
<tr>
<th>BUDGET</th>
<th>FORECAST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relate to planned event.</td>
<td>Concern with probable event.</td>
</tr>
<tr>
<td>Comprise whole business unit.</td>
<td>Cover limited function.</td>
</tr>
<tr>
<td>Planned separately for each account period.</td>
<td>Cover long period.</td>
</tr>
<tr>
<td>Tool of control.</td>
<td>Not a tool for control.</td>
</tr>
<tr>
<td>Budget starts when forecast ends &amp; convert it into budget.</td>
<td>Forecast end with forecast of likely event.</td>
</tr>
</tbody>
</table>
TYPES OF BUDGET

FIXED:

It is dawn for one level of activity & one set of condition. It is rigid & is based on assumption that there will be no change in budgeted level of activity.

<table>
<thead>
<tr>
<th>Flexible</th>
<th>Budget designed to change in accordance with level of activity attained.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic</td>
<td>It is prepared for use for a long period of time.</td>
</tr>
<tr>
<td>Current</td>
<td>Relate to current condition &amp; is used over short time period.</td>
</tr>
<tr>
<td>Long term</td>
<td>It is prepared for more than one year e.g.</td>
</tr>
<tr>
<td></td>
<td>• Capital Expenditure Budget.</td>
</tr>
<tr>
<td></td>
<td>• Research &amp; Development Budget.</td>
</tr>
</tbody>
</table>

SHORT TERM:

<table>
<thead>
<tr>
<th>Period</th>
<th>It is prepared for less than 12 months.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Useful For</td>
<td>• Lower management level.</td>
</tr>
<tr>
<td></td>
<td>• Control purposes. e.g.</td>
</tr>
</tbody>
</table>

THE ORDER OF BUDGET PREPARATION

Assuming that the principal budget factor has been identified as being sales, the stages involved in the preparation of a budget can be summarized as follows.

(a) The sales budget is prepared in units of product and sales value. The finished goods inventory budget can be prepared at the same time. This budget decides the planned increase or decrease in finished goods inventory levels.

(b) With the information from the sales and inventory budgets, the production budget can be prepared. This is, in effect, the sales budget in units plus (or minus) the increase (or decrease) in finished goods inventory. The production budget will be stated in terms of units.

(c) This leads on logically to budgeting the resources for production. This involves preparing a materials usage budget, machine usage budget and a labor budget.
(d) In addition to the materials usage budget, a **materials inventory budget** will be prepared, to decide the planned increase or decrease in the level of inventory held. Once the raw materials usage requirements and the raw materials inventory budget are known, the purchasing department can prepare a **raw materials purchases budget** in quantities and value for each type of material purchased.

(e) During the preparation of the sales and production budgets, the managers of the cost centers of the organization will prepare their draft budgets for the department **overhead costs**. Such overheads will include maintenance, stores, administration, selling and research and development.

(f) From the above information a **budgeted income statement** can be produced.

(g) In addition several other budgets must be prepared in order to arrive at the **budgeted statement of financial position**. These are the **capital expenditure budget** (for non-current assets), the **working capital budget** (for budgeted increases or decreases in the level of receivables and accounts payable as well as inventories), and a **cash budget**.

### PURCHASE BUDGET

<table>
<thead>
<tr>
<th></th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Unit Sold</td>
<td>XXX</td>
</tr>
<tr>
<td>Add- Ending Inventory of Finished Goods</td>
<td>XXX</td>
</tr>
<tr>
<td>Total needs</td>
<td>XXX</td>
</tr>
<tr>
<td>Less- Beginning Inventory of Finished Goods</td>
<td>XXX</td>
</tr>
<tr>
<td>Required production/Units to be produced</td>
<td>XXX</td>
</tr>
</tbody>
</table>

### DIRECT MATERIAL PURCHASE/USAGE BUDGET

The materials purchases budget is the budget for the purchase cost of materials that will be purchased in the budget period. The materials purchases budget might be prepared for all materials, direct and indirect, or for direct materials only.

The purchases budget differs from the materials usage budget by the amount of the planned increase or decrease in inventory levels of materials in the budget period.

<table>
<thead>
<tr>
<th></th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Material needed to meet the production schedule</td>
<td>XXX</td>
</tr>
<tr>
<td>Add- Ending Inventory of raw material</td>
<td>XXX</td>
</tr>
<tr>
<td>Total Raw Material needs</td>
<td>XXX</td>
</tr>
<tr>
<td>Less- Beginning Inventory of raw material</td>
<td>XXX</td>
</tr>
<tr>
<td>Raw Material to be production</td>
<td>XXX</td>
</tr>
</tbody>
</table>
Making a sales forecast is like shooting an arrow. Major factors to consider while forecasting sales includes:

1. Past sales level & trends.
2. General economic trends.
3. Political & legal events.
4. Planned advertising & product promotion.
5. Intended pricing policy.
7. Economic trends in company industry.
8. Market research studies.

**DIRECT LABOUR BUDGET**

It is a statement of the quantities of direct labour required for production, and its cost. The budget is prepared for different grades of labour separately, but the total labour cost should also be shown.

For each grade of labour, the expected hours of work should be calculated, for making the budgeted production quantities of product individually and then for all the products in total. The total budget in hours for each grade of labour is converted into a cost at the standard/budgeted rate per hour for the grade of labour.

<table>
<thead>
<tr>
<th>Required Production (from production budget)</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor hour</td>
<td></td>
</tr>
<tr>
<td>Total direct labor hour needs</td>
<td>XXX</td>
</tr>
<tr>
<td>Direct labor cost per hour</td>
<td>XXX</td>
</tr>
<tr>
<td><strong>Total direct labor cost</strong></td>
<td>XXX</td>
</tr>
</tbody>
</table>

**OVERHEADS BUDGETS**

Overheads budgets are prepared for each department or cost centre, in production, administration and sales and distribution.

1. To prepare expenditure budgets for each overhead cost centre, overhead expenditure is allocated and apportioned using available methods.
2. In an absorption costing system, an overhead absorption rate should then be calculated from the total budgeted expenditure and the budgeted volume of
activity. When flexed budgets are prepared, overhead costs might be divided into variable and fixed costs.

<table>
<thead>
<tr>
<th></th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material</td>
<td></td>
</tr>
<tr>
<td>Direct labor</td>
<td></td>
</tr>
<tr>
<td>Variable Overhead</td>
<td></td>
</tr>
<tr>
<td>Fixed Overhead</td>
<td></td>
</tr>
<tr>
<td><strong>Total Overhead cost</strong></td>
<td><strong>XXX</strong></td>
</tr>
</tbody>
</table>

**BUDGETARY CONTROL**

One of the main purposes of budgeting is budgetary control and the control of costs. Costs can be controlled by comparing budgets with the results actually achieved. Differences between expected results and actual results are known as variances. Variances can be either favorable (F) or adverse (A) depending on whether the results achieved are better or worse than expected. Favourable variances increase profits and adverse variances decrease profits.

There are three different types of budget.

1. Fixed budgets
2. Flexed budgets
3. Flexible budgets.

**FIXED BUDGETS**

1. The original budget prepared at the beginning of a budget period is known as the fixed budget.
2. A fixed budget is a budget for a specific volume of output and sales activity, and it is the ‘master plan’ for the financial year that the company tries to achieve.
3. The term ‘fixed’ in ‘fixed budget’ means that the output and sales volumes are for a fixed amount or quantity.
4. A fixed budget might be suitable as a plan, provided that the business environment is fairly stable and sales and production volumes should be predictable with reasonable accuracy.
5. Fixed budgets are not suitable for budgetary control reporting because the variances calculated with a fixed budget can provide misleading information.
FLEXED BUDGETS

1. A flexed budget is a budget prepared to show the revenue, costs and profits that should have been expected from the actual volumes of production and sale.
2. A flexed budget is prepared for the actual volume of sales and output, and it allows for the fact that sales revenues and variable costs should be expected to increase or fall with increases or falls in sales and output.
3. A flexed budget is prepared at the end of the budget period when the actual results are known. It is used to compare:
   1. the actual results with the flexed budget
   2. the fixed budget with the flexed budget.
4. If a flexed budget is compared with the actual results for a period, the differences between the two (variances) are much more meaningful than if the fixed budget and actual results are compared.

FLEXIBLE BUDGETS

Flexible budgets are not the same as flexed budgets, although they are similar.

Flexible budgets are prepared at the end of a budget period and look back at what costs, revenues and profits should have been in a period (based on actual activity levels). They are used to calculate variances for the purpose of management control and control reporting (budgetary control).

Flexible budgets are forward-looking and are prepared at the beginning of a budget period when the fixed (original) budget is prepared. Flexible budgets are prepared to show the results that would be expected at different levels of activity, for example, at 75%, 80% and 85% of the full capacity. They might be prepared when there is uncertainty about what the actual volumes of sales and production will be, and several budgets are therefore prepared for a number of different possible outcomes.

CASH BUDGET

<table>
<thead>
<tr>
<th>Opening Cash balance</th>
<th>XXX</th>
<th>YYY</th>
<th>ZZZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add- Receipts from debtors</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>Add- Sales of Capital items</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>Add- Any loan received</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>Add- Proceed for share issues</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>Add- Any other cash receipts</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>= Total Cash Available</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>Less- Payments to creditors</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>Less- Cash purchases</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>Description</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>-------------------------------------------------------------------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Less- Wages &amp; salaries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less- Loan Repayments</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>Less- Capital expenditure</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>Less- Dividends</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>Less- Taxation</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>Less- Any other cash disbursements</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>= Closing Cash Balance</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>Desired Balance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash Balance before Borrowing</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
<tr>
<td>Add- Borrowings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less- Repayments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less- Interest Payments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash Balance after Borrowing</td>
<td>XXX</td>
<td>YYY</td>
<td>ZZZ</td>
</tr>
</tbody>
</table>

Closing Balance XXX
Desired Level XXX

- Negative answer means that we have to borrow
- Positive answer means that we don’t have to borrow

### RECONCILIATION OF BUDGETED CASH FLOW & PROFIT

<table>
<thead>
<tr>
<th>Budgeted Cash Flow</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add – Payments appearing in cash budget but never appearing in P &amp; L account</td>
<td>XXX</td>
</tr>
<tr>
<td>Add – Receipts appearing in the P &amp; L account but never appearing in the cash budget</td>
<td>XXX</td>
</tr>
<tr>
<td>Less – Charges appearing in the P &amp; L account but never appearing in the cash budget</td>
<td>XXX</td>
</tr>
<tr>
<td>Less - Receipts appearing in the cash budget but never appearing in the P &amp; L account</td>
<td>XXX</td>
</tr>
<tr>
<td>Add – Sales/receipts adjustment</td>
<td>XXX</td>
</tr>
<tr>
<td>Less – Purchases/payments adjustment</td>
<td>XXX</td>
</tr>
<tr>
<td>Less – Expenses/Payments adjustment</td>
<td>XXX</td>
</tr>
<tr>
<td>Budgeted Profit</td>
<td>XXX</td>
</tr>
</tbody>
</table>
## Budgetary Control Analysis

<table>
<thead>
<tr>
<th></th>
<th>Fixed Budget</th>
<th>Flexible Budget</th>
<th>Actual budget</th>
<th>Budget Variances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production &amp; Sales (Units)</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Sales</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Variable Costs</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>DM</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>DL</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>V/FOH</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Semi – Variable Costs</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Fixed Costs</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Total costs</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Profit</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
</tbody>
</table>

**NOTE:**

1. Variances are calculated by comparing actual results & the flexible budgets, not actual budgets & the original budgets.
2. The correct approach is as follows:
   - Identify fixed & variable costs
   - Produce a flexible budget using marginal costing techniques.

### Flexible Budgeting:

Important points include:

1. No concern with actual results.
2. Classification of cost by behaviors is the most important element in flexible budgeting.
3. If cost is variable, identify that it is variable with reference to: no of units/no of hours.
4. If cost is semi variable, then normally high & low method is used to apportion fixed & variable portion.
5. Please remember that DO NOT flex fixed cost.

### Steps in the Preparation of Capital Expenditure Budgets

**Step - 1:** An accountant or budget officer should be responsible for the capital expenditure budget. Their tasks should include communicating between interested parties, providing necessary data to assist in budget preparation, drawing up a timetable to ensure that proper consultation takes place and so on.
Step - 2: Sales, production and related budgets cover, in general, a 12-month period. A detailed capital expenditure budget should be prepared for the budget period but additional budgets should be drawn up for both the medium and long term. This requires an in-depth consideration of the organisation's requirements for land, buildings, plant, machinery, vehicles, fixtures and fittings and so on for the short, medium and long term.

Step - 3: The budget covering the 12 month period should be broken down into monthly or quarterly spending, and details incorporated into the cash budget.

Step - 4: Suitable financing must be arranged as necessary.

Step - 5: The capital expenditure budget should take account of the principal budget factor. If available funds are limiting the organisation's activities then they will more than likely limit capital expenditure.

Step - 6: As part of the overall budget coordination process, the capital expenditure budget must be reviewed in relation to the other budgets. Proposed expansion of production may well require significant non-current asset expenditure which should be reflected in the budget.

Step - 7: The capital expenditure budget should be updated on a regular basis since both the timing and amount of expenditure can change at short notice.

PREPARATION OF FLEXIBLE BUDGETS

Step - 1: The first step in the preparation of a flexible budget is the determination of cost behaviour patterns, which means deciding whether costs are fixed, variable or semi-variable.

- Fixed costs are easy to spot. They remain constant as activity levels change.
- For non-fixed costs, divide each cost figure by the related activity level. If the cost is a variable cost, the cost per unit will remain constant. If the cost is a semi-variable cost, the unit rate will reduce as activity levels increase.

Step - 2: The second step in the preparation of a flexible budget is to calculate the budget cost allowance for each cost item.

\[
\text{Budget cost allowance} = \text{budgeted fixed cost} + (\text{number of units} \times \text{variable cost per unit})
\]

* Nil for variable cost
** Nil for fixed cost
Semi-variable costs therefore need splitting into their fixed and variable components so that the budget cost allowance can be calculated.
STANDARD COSTING

1. The term standard refers to pre-determined, estimated unit costs & revenues.
2. Often called “Budget for an individual unit of production”
3. Standard cost system applies to standard cost center.
4. Sale variance applies to revenue center.

STANDARD COSTING: Pre-determined estimated unit cost used for stock valuation & control. It may be used both in absorption costing & marginal costing.

COMPARISONS:

<table>
<thead>
<tr>
<th></th>
<th>Standard will be compared to Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>Standard will NOT be compared to Budgeted</td>
</tr>
<tr>
<td>Budgeted</td>
<td>Actual will NOT be compared to Actual</td>
</tr>
</tbody>
</table>

STANDARD HOUR: Hour which measure the amount of work that should be performed in one hour under standard condition.

SUITABILITY: Common / repetitive operations. E.g. manufacturing & service.

LESSONS:

1. Clearly label variance as ADVERSE or FAVORABLE.
2. Flexed budgeted figures are to be used.
3. In marginal costing, fixed volume variances will not exist.

STANDARD VS BUDGETED COST

<table>
<thead>
<tr>
<th>STANDARD COST</th>
<th>BUDGETED COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Amount</td>
<td>Total Amount</td>
</tr>
<tr>
<td>Part of double entry system</td>
<td>Not part of double entry system</td>
</tr>
<tr>
<td>Controlling cost</td>
<td>Planning cost</td>
</tr>
<tr>
<td>Estimate of actual capacity</td>
<td>Estimate of normal capacity</td>
</tr>
<tr>
<td>Cost expectation of per unit</td>
<td>Cost expectation of total unit of activity</td>
</tr>
<tr>
<td>of activity</td>
<td></td>
</tr>
</tbody>
</table>
**TYPES**

| Basic         | • Use for comparison.  
|               | • Unchanged over long period.  
| Ideal         | • Represent perfect performance.  
|               | • Minimum cost possible under perfect information.  
|               | • Not used in real world due to adverse impact on employee motivation.  
| Currently attainable | • Use for plan & control.  
|               | • Should be incurred under efficient operating condition.  
|               | • Difficult not impossible to achieve.  

**BRITISH DECISION RULE**

| Actual is HIGH | Adverse |  
| Actual is LOW  | Favorable |  

**NOTE:** The above rule will not apply to Sales & Volume Variances.

**AMERICAN DECISION RULE**

| Positive | Favorable |  
| Negative | Adverse |  

**AMERICAN APPROACH TO VARIANCE ANALYSIS**

**TWO VARIANCE**

**CONTROLLABLE VARIANCE:**

Actual FOH

Budgeted FOH for Capacity Attained

→ Budgeted FOH for Capacity Attained = (Fixed Cost + Standard Hour * Standard Variable Rate)
VOLUME VARIANCE:

Budgeted FOH for Capacity Attained
Applied FOH

\[
\text{Applied FOH} = (\text{Standard Hour} \times \text{Total Standard Rate})
\]

THREE VARIANCE

CAPACITY VARIANCE:

Applied FOH
Budgeted FOH for Capacity Attained

\[
\text{Budgeted FOH for Capacity Attained} = (\text{Fixed Cost} + \text{Actual Hour} \times \text{Standard Variable Rate})
\]
SPENDING / EXPENDITURE VARIANCE:

Budgeted FOH for Capacity Attained

Actual FOH

→ Budgeted FOH for Capacity Attained = (Fixed Cost + Actual Hour * Standard Variable Rate)

<table>
<thead>
<tr>
<th>DECISION RULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual High</td>
</tr>
<tr>
<td>Actual Low</td>
</tr>
</tbody>
</table>

EFFICIENCY VARIANCE:

Actual Hour Worked * Standard Rate

Standard Hour Allowed * Standard Rate

<table>
<thead>
<tr>
<th>DECISION RULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual High</td>
</tr>
<tr>
<td>Actual Low</td>
</tr>
</tbody>
</table>

FOUR VARIANCE

CAPACITY VARIANCE:

Applied FOH

Budgeted FOH for Capacity Attained

→ Applied FOH = (Standard Hour * Total Standard Rate)

→ Budgeted FOH for Capacity Attained = (Fixed Cost + Actual Hour * Standard Variable Rate)

<table>
<thead>
<tr>
<th>DECISION RULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted High</td>
</tr>
<tr>
<td>Budgeted Low</td>
</tr>
</tbody>
</table>
**SPENDING / EXPENDITURE VARIANCE:**

Budgeted FOH for Capacity Attained XXX
Actual FOH XXX

Bugeted FOH for Capacity Attained = (Fixed Cost + Actual Hour * Standard Variable Rate)

<table>
<thead>
<tr>
<th>DECISION RULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual High</td>
</tr>
<tr>
<td>Actual Low</td>
</tr>
</tbody>
</table>

**FIXED EFFICIENCY VARIANCE:**

Actual Hour Worked * Standard Fixed Rate XXX
Standard Hour Allowed * Standard Fixed Rate XXX

<table>
<thead>
<tr>
<th>DECISION RULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual High</td>
</tr>
<tr>
<td>Actual Low</td>
</tr>
</tbody>
</table>

**VARIABLE EFFICIENCY VARIANCE:**

Budgeted FOH for Capacity Attained XXX
Budgeted FOH for Standard Hour Worked XXX

Bugeted FOH for Capacity Attained = (Fixed Cost + Actual Hour * Standard Variable Rate)

Bugeted FOH for Standard Hour Worked = (Fixed Cost + Standard Hour * Standard Variable Rate)

<table>
<thead>
<tr>
<th>DECISION RULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted High</td>
</tr>
<tr>
<td>Budgeted Low</td>
</tr>
</tbody>
</table>
Material Variances are divided into two variances:

1. Material Price Variance.

### Direct Material Price Variance

<table>
<thead>
<tr>
<th>BRITISH</th>
<th>AMERICAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Actual Cost – Standard Cost)</td>
<td>(Standard cost of material – Actual cost of Material)</td>
</tr>
<tr>
<td><strong>OR</strong></td>
<td><strong>OR</strong></td>
</tr>
<tr>
<td><strong>Actual Cost – (Actual Qty * SR)</strong></td>
<td><strong>Standard base on actual output * standard rate) – (Actual usage * Actual rate)</strong></td>
</tr>
<tr>
<td><strong>OR</strong></td>
<td><strong>Where,</strong></td>
</tr>
<tr>
<td><strong>(AQ * AR) – (AQ * SR)</strong></td>
<td><strong>Standard base on actual output = unit made * per kg / hr</strong></td>
</tr>
<tr>
<td><strong>AMERICAN</strong></td>
<td><strong>Actual Rate = Cost / hrs</strong></td>
</tr>
</tbody>
</table>

### Direct Material Usage Variance

<table>
<thead>
<tr>
<th>BRITISH</th>
<th>AMERICAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR (Actual Qty – SQA)</td>
<td>Standard rate (Standard based on actual output – Actual usage)</td>
</tr>
<tr>
<td><strong>&lt; Standard Qty Allowed &gt;</strong></td>
<td><strong>Where,</strong></td>
</tr>
<tr>
<td><strong>1. Standard base on actual output = unit made * per kg / hr</strong></td>
<td><strong>2. Actual Rate = Cost / hrs</strong></td>
</tr>
</tbody>
</table>

**Total Material Variance:** Material Price Variance + Material Usage Variance
**PRICE VARIANCE VARIATIONS**

1 - **PURCHASE QUANTITY**

**Raw Material**

<table>
<thead>
<tr>
<th>Purchase (AQ * AR)</th>
<th>Price Variance</th>
<th>AQ (AR-SR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qty Variance</td>
<td>SR (AQ-SQA)</td>
<td></td>
</tr>
<tr>
<td>WIP</td>
<td>(SQA * SR)</td>
<td></td>
</tr>
<tr>
<td>Closing Stock</td>
<td>(Actual Qty – Qty Consumed) * SR</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** Closing stock is recorded at SR.

**Total Direct Material Variance**

- (Actual Cost – Standard Cost)
- \( SC = SQA \times SR \)
- \( AC = \text{Consume cost (not purchase cost)} \)
- \( (O/BAL + PUR – C/BAL) \)

**Direct Material Price Variance**

- BRITISH
  - Actual Qty (AR – SR) OR
  - Actual Cost – (Actual Qty * SR)

**Direct Material Usage Variance**

- BRITISH
  - SR (Actual Qty – SQA) < Standard Qty Allowed >
## CONSUME QUANTITY

### Raw Material

<table>
<thead>
<tr>
<th>Purchase (AQ * AR)</th>
<th>Price Variance</th>
<th>CQ (AR-SR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qty Variance</td>
<td>SR (AQ-SQA)</td>
<td></td>
</tr>
<tr>
<td>WIP</td>
<td>(SQA * SR)</td>
<td></td>
</tr>
<tr>
<td>Closing Stock</td>
<td>(Actual Qty – Qty Consumed) * AR</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** Closing stock is recorded at AR.

### Total Direct Material Variance

- **BRITISH**
  - (Actual Cost – Standard Cost)
  - \( SC = SQA \times SR \)
  - \( AC = \) Consume cost (not purchase cost)
    - \( (O/BAL + PUR – C/BAL) \)

### Direct Material Price Variance

- **BRITISH** Consumed Qty (AR – SR)

### Direct Material Usage Variance

- **BRITISH** SR (Actual Qty – SQA)
  - \(<\) Standard Qty Allowed

### VALUE OF CLOSING STOCK OF RAW MATERIAL | CALCULATION OF PRICE VARIANCE

<table>
<thead>
<tr>
<th>Standard Cost</th>
<th>Material Purchased</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Cost</td>
<td>Material Used</td>
</tr>
</tbody>
</table>

### DIFFERENCE BETWEEN TWO METHODS

<table>
<thead>
<tr>
<th>PURCHASE QTY</th>
<th>CONSUME QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period Cost</td>
<td>Product Cost</td>
</tr>
<tr>
<td>Not considered for stock valuation</td>
<td>Considered for stock valuation</td>
</tr>
<tr>
<td>Cost charge in period in which it is incurred</td>
<td>Cost charge in period in which it is sold</td>
</tr>
</tbody>
</table>
### WHICH METHOD TO USE

<table>
<thead>
<tr>
<th>PURCHASE QTY</th>
<th>CONSUME QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closing stock is valued at SR</td>
<td>Closing stock is valued at AR</td>
</tr>
<tr>
<td>Variance is considered as period cost</td>
<td>Variance is considered as product cost</td>
</tr>
<tr>
<td>Variance is recorded at earliest stage</td>
<td>--</td>
</tr>
</tbody>
</table>

**INDICATION:** No indication is given > use purchase qty method.

### LABOR VARIANCES

#### Total Direct Labor Variance

<table>
<thead>
<tr>
<th>BRITISH</th>
<th>AMERICAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Actual Cost – Standard Cost)</td>
<td>(Standard cost of Labor – Actual cost of Labor) OR (Standard base on actual hour * standard rate) – (Actual hour * Actual rate)</td>
</tr>
</tbody>
</table>

Where,
1. Standard base on actual hour = unit hour * per kg / hr
2. Actual Rate = Cost / hrs

#### Direct Labor Rate Variance

<table>
<thead>
<tr>
<th>BRITISH</th>
<th>AMERICAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Hr ( AR – SR) OR Actual Cost – ( Actual Hr * SR)</td>
<td>Actual Hr ( SR – AR) Actual hour &amp; productive hour is same thing. Productive hour = Actual hour – Idle hour</td>
</tr>
</tbody>
</table>

#### Direct Labor Efficiency Variance

<table>
<thead>
<tr>
<th>BRITISH</th>
<th>AMERICAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR (Actual Hr – SHA) &lt; Standard Hr Allowed &gt; (Actual Yield * Standard time per unit)</td>
<td>Standard rate (Standard based on actual hr – Actual hr) Where, Standard base on actual hr = unit hr * per kg / hr Actual Rate = Cost / hrs</td>
</tr>
</tbody>
</table>
Idle hour Variance: Standard rate * idle time

Where, Idle time = Actual hour – Productive hour

Note: Idle hour variance will always be adverse.

Total labor Variance: Labor Pay Rate Variance + Labor Efficiency Variance + Idle hour Variance

**VARIABLE FOH VARIANCES**

Total Variable FOH Variance

\[ AVC - (SHA \times SVR) \]

Spending Variance

\[ \text{(AVC - SVC)} \]
\[ (AH \times AVR) - (AH \times SVR) \]
\[ AH (AVR - SVR) \]
\[ AVC - (AH \times SR) \]

Variable Efficiency Variance

\[ SVR (AH - SHA) \]

**FIXED FOH VARIANCE**

Total Fixed FOH Variance

\[ (AFC - SFC) \]

Fixed Volume Variance

\[ SR (BH - SHA) \]

Fixed Expenditure Variance

\[ BFC - AFC \]

Capacity Variance

\[ SFR (BH - AH) \]

Fixed Efficiency Variance

\[ SFR (AH - SHA) \]
GROSS PROFIT ANALYSIS

<table>
<thead>
<tr>
<th></th>
<th>Budgeted</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Units</td>
<td>10000</td>
<td>9800</td>
</tr>
<tr>
<td>Sales Per Unit</td>
<td>10</td>
<td>10.8</td>
</tr>
<tr>
<td>Cost Per Unit</td>
<td>9</td>
<td>8.6</td>
</tr>
<tr>
<td>Sales</td>
<td>100000</td>
<td>105840</td>
</tr>
<tr>
<td>Cost of Sales</td>
<td>(80000)</td>
<td>(84280)</td>
</tr>
<tr>
<td>Gross Profit</td>
<td>20000</td>
<td>21560</td>
</tr>
</tbody>
</table>

NOTE: last year actual figures are assumed to be budgeted if two years are involved. This year will be actual year.

USE OF SQA & BQ

<table>
<thead>
<tr>
<th>Standard Quantity Allowed</th>
<th>Raw Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Quantity</td>
<td>Finished Goods</td>
</tr>
</tbody>
</table>

DECISION RULE FOR GP ANALYSIS

| GP / Sales is Positive    | FAVOURABLE    |
| GP / Sales is Negative    | ADVERSE       |
| CGS is Positive          | ADVERSE       |
| CGS is Negative          | FAVOURABLE    |
**CALCULATIONS OF GP ANALYSIS**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gross Profit Difference</strong></td>
<td>21560 – 20000 = 1560 (A)</td>
</tr>
<tr>
<td><strong>Sales</strong></td>
<td>105840 – 100000 = 5840 (F)</td>
</tr>
<tr>
<td><strong>CGS</strong></td>
<td>84280 – 80000 = 4280 (A)</td>
</tr>
<tr>
<td><strong>Sale Price</strong></td>
<td>9800(10.8-10) = 7840 (F)</td>
</tr>
<tr>
<td><strong>Sale Quantity</strong></td>
<td>10(9800-10000) = 2000 (A)</td>
</tr>
<tr>
<td><strong>CGS Price</strong></td>
<td>9800(8.6-8) = 5880 (A)</td>
</tr>
<tr>
<td><strong>CGS Quantity</strong></td>
<td>8(9800-10000) = 1600 (F)</td>
</tr>
</tbody>
</table>

**TWO OR MORE MIX CASES**

**Cost Volume + Sales Volume = Net Volume / Sales Margin**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SR of Gross Profit (AQ - BQ)</strong></td>
<td>2(9800-10000) = 4000 (A)</td>
</tr>
<tr>
<td><strong>SR of Gross Profit (AQ at Actual Mix - BQ)</strong></td>
<td></td>
</tr>
</tbody>
</table>

**SALES MIX VARIANCE**

SR of Gross Profit (AQ at Actual Mix – AQ at Standard Mix)

**SALES VOLUME VARIANCE**

SR of Gross Profit (AQ at Standard Mix - BQ)

Following three variance are used in Gross Profit analysis:

1. Sale price
2. Cost price
3. Net volume

**STANDARD COST RATIOS**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production Volume Ratio</strong></td>
<td>SFR(BH-SHA) \rightarrow SHA/BH * 100</td>
</tr>
<tr>
<td><strong>Production Capacity Ratio</strong></td>
<td>SFR(BH-AH) \rightarrow AH/BH * 100</td>
</tr>
<tr>
<td><strong>Productivity/Efficiency Ratio</strong></td>
<td>SFR(AH-SHA) \rightarrow SHA/AH * 100</td>
</tr>
</tbody>
</table>

**DECISION RULE**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient</td>
<td>Greater than 100%</td>
</tr>
<tr>
<td>In-efficient</td>
<td>Less than 100%</td>
</tr>
</tbody>
</table>

**CALENDAR VARIANCE**

SR of Fixed Cost per day (Budgeted Days – Actual Days)
MIX VARIANCES

- This involves two or more raw material.
- This includes mix & yield variances.

**APPROACH # 01 (THIS ONE IS RECOMMENDED)**

<table>
<thead>
<tr>
<th>DM Total Cost Variance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRICE VARIANCE</strong></td>
<td><strong>USAGE VARIANCE</strong></td>
</tr>
<tr>
<td>AQ (AR –SR)</td>
<td>SR (AQ at Actual Mix – SQA)</td>
</tr>
<tr>
<td>AC – (AQ * SR)</td>
<td>(AQ<em>SR) – (SQA</em>SR)</td>
</tr>
<tr>
<td>(AQ<em>AR) – (AQ</em>SR)</td>
<td></td>
</tr>
</tbody>
</table>

Usage Variance is divided into Mix & Yield Variance

<table>
<thead>
<tr>
<th>MIX VARIANCE</th>
<th>YIELD VARIANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR (AQ at Actual Mix – AQ at Standard Mix)</td>
<td>SR (AQ at Standard Mix – SQA)</td>
</tr>
<tr>
<td>(AQ<em>SR) - (Total AQ</em>Weighted Per Unit Cost)</td>
<td></td>
</tr>
</tbody>
</table>

Weighted Average

Usage Variance

**Raw Material** | **Kg** | **Rate Per Kg** | **Cost** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>12</td>
<td>5</td>
<td>60</td>
</tr>
<tr>
<td>B</td>
<td>8</td>
<td>12.5</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>8 (160/20)</td>
<td>160</td>
</tr>
</tbody>
</table>

- 8 is the weighted average cost per unit
- The weighted average cost per unit is used where quantities are given in the ratio of 60:40 of standard.

**APPROACH # 02**

<table>
<thead>
<tr>
<th>Material Price Variance</th>
<th>Material Mix Variance</th>
<th>Material Yield Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>(AQ<em>AM</em>AR) – (AQ<em>AM</em>SR)</td>
<td>(AQ<em>AM</em>SR) – (AQ<em>SM</em>SR)</td>
<td>(AQ<em>SM</em>SR) – (SQ<em>SM</em>SR)</td>
</tr>
</tbody>
</table>
SQ*SM is calculated as follows:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Cases</th>
<th>Formulae</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Unit Produce is given</td>
<td>Unit produce * Total Actual Qty / Total Actual Qty – Loss</td>
</tr>
<tr>
<td>2</td>
<td>Unit Produce is not given</td>
<td>Total Actual Qty / Total Standard Qty * Total Standard – Loss</td>
</tr>
</tbody>
</table>

Material Yield Variance can also be calculated as follows:

(Actual Yield – Standard Yield on Actual Input) * SR

- Actual Yield = Total Units – Loss Units
- SR = Total Cost – Normal Loss scrap value
  Total Units – Normal Loss units

O/S + PURCHASES - C/S is given

<table>
<thead>
<tr>
<th>Material Price Variance</th>
<th>Purchases will be actual quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Mix Variance</td>
<td>Actual Consumption will be actual quantity</td>
</tr>
<tr>
<td>Material Yield Variance</td>
<td>Actual Consumption / Total Standard Qty * Total Standard – Loss</td>
</tr>
</tbody>
</table>

Actual Consumption = Opening Balance + Purchases – Closing Balance

EPR Adjustment

EPR balance will be used for Standard Quantity Allowed & Standard Hour Allowed in Material Usage Variance & Labor Efficiency Variance.

**Standard Quantity Allowed (Based on FIFO)** =

Actual Unit * Standard consumption per unit

**Standard Hour Allowed (Based on FIFO)** =

Actual Unit * Standard time per unit
WASTAGES

1. Normal Loss is not inefficiency.
2. Variance is due to Abnormal Loss.
4. Loss to be adjusted in SQA as follows: Actual Qty * 100% / 100% - Normal Loss %

**DL Total Cost Variance**

(Actual Cost – Standard Cost)

<table>
<thead>
<tr>
<th>RATE VARIANCE</th>
<th>EFFICIENCY VARIANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AH (AR – SR)</td>
<td>SR (AH at Actual Mix – SQA)</td>
</tr>
<tr>
<td>AC – (AH * SR)</td>
<td>(AH<em>SR) – (SHA</em>SR)</td>
</tr>
<tr>
<td>(AH<em>AR) – (AH</em>SR)</td>
<td></td>
</tr>
</tbody>
</table>

Efficiency Variance is divided into Mix & Yield Variance

<table>
<thead>
<tr>
<th>MIX VARIANCE</th>
<th>YIELD VARIANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR (AH at Actual Mix – AH at Standard Mix )</td>
<td>SR (AH at Standard Mix – SHA)</td>
</tr>
</tbody>
</table>

1. Labor Mix Variance is also called Gang Variance OR Team Composition Variance.
2. Labor Yield Variance is also called Gang Productivity Variance OR Team Productivity Variance.

**IDLE HOUR VARIANCE**

SR (AH Paid – SHA)

<table>
<thead>
<tr>
<th>IDLE TIME VARIANCE</th>
<th>REAL EFFICIENCY VARIANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR (AH Paid – AH worked)</td>
<td>SR (AH worked – SHA)</td>
</tr>
</tbody>
</table>

**DL EFFICIENCY VARIANCE**

SR (AH – SHA)

<table>
<thead>
<tr>
<th>REAL EFFICIENCY VARIANCE</th>
<th>YIELD VARIANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR (AH – SHA for Standard Yield )</td>
<td>SR (SHA for Standard Yield – SHA for Actual Yield)</td>
</tr>
</tbody>
</table>

SHA for Standard Yield = Actual Yield * input OR hour required / output
SHA for Actual Yield = Standard Yield * input OR hour required / output
Standard Yield = Actual Input * Output / Input
**RECONCILIATION OF BUDGET & ACTUAL PROFIT – ABSORPTION COSTING**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Profit (budgeted sales * standard profit)</td>
<td>XXX</td>
</tr>
<tr>
<td>Sale Volume Variance</td>
<td>XXX</td>
</tr>
<tr>
<td>Standard profit on actual sales (actual sales * standard profit)</td>
<td>XXX</td>
</tr>
<tr>
<td>Sale price variance</td>
<td>XXX</td>
</tr>
<tr>
<td>Profit before cost variance</td>
<td>XXX</td>
</tr>
<tr>
<td><strong>Cost Variance:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ADV</td>
</tr>
<tr>
<td>Materials</td>
<td></td>
</tr>
<tr>
<td>- Price</td>
<td>XXX</td>
</tr>
<tr>
<td>- Usage</td>
<td>XXX</td>
</tr>
<tr>
<td>Labor</td>
<td></td>
</tr>
<tr>
<td>- Rate</td>
<td>XXX</td>
</tr>
<tr>
<td>- Efficiency</td>
<td>XXX</td>
</tr>
<tr>
<td>Variable Overhead</td>
<td></td>
</tr>
<tr>
<td>- Spending</td>
<td>XXX</td>
</tr>
<tr>
<td>- Efficiency</td>
<td>XXX</td>
</tr>
<tr>
<td>Fixed Overhead</td>
<td></td>
</tr>
<tr>
<td>- Expenditure</td>
<td>XXX</td>
</tr>
<tr>
<td>- Volume</td>
<td>XXX</td>
</tr>
<tr>
<td>- Capacity</td>
<td>XXX</td>
</tr>
<tr>
<td>- Efficiency</td>
<td>XXX</td>
</tr>
<tr>
<td>Actual Profit</td>
<td>XXX</td>
</tr>
</tbody>
</table>

**Standard profit** = sales – direct material – direct labor – variable expense – fixed overhead

**RECONCILIATION OF BUDGET & ACTUAL PROFIT – MARGINAL COSTING**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Profit (budgeted sales * standard contribution)</td>
<td>XXX</td>
</tr>
<tr>
<td>Less - Budgeted fixed overhead cost</td>
<td>(XXX)</td>
</tr>
<tr>
<td><strong>Budgeted Contribution</strong></td>
<td>XXX</td>
</tr>
<tr>
<td>Sale Volume Variance</td>
<td>XXX</td>
</tr>
<tr>
<td>Standard Contribution on actual sales (actual sales * standard contribution)</td>
<td>XXX</td>
</tr>
<tr>
<td>Sale price variance</td>
<td>XXX</td>
</tr>
<tr>
<td>Contribution before cost variance</td>
<td>XXX</td>
</tr>
<tr>
<td><strong>Variable Cost Variance:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ADV</td>
</tr>
<tr>
<td>Materials</td>
<td></td>
</tr>
<tr>
<td>- Price</td>
<td>XXX</td>
</tr>
<tr>
<td>- Usage</td>
<td>XXX</td>
</tr>
<tr>
<td>Labor</td>
<td></td>
</tr>
<tr>
<td>- Rate</td>
<td>XXX</td>
</tr>
<tr>
<td>- Efficiency</td>
<td>XXX</td>
</tr>
<tr>
<td>Variable Overhead</td>
<td></td>
</tr>
<tr>
<td>- Spending</td>
<td>XXX</td>
</tr>
<tr>
<td>- Efficiency</td>
<td>XXX</td>
</tr>
<tr>
<td>Fixed Overhead</td>
<td></td>
</tr>
<tr>
<td>- Budgeted</td>
<td>XXX</td>
</tr>
<tr>
<td>- Expenditure</td>
<td>XXX</td>
</tr>
<tr>
<td>Actual Profit</td>
<td>XXX</td>
</tr>
</tbody>
</table>
Standard contribution = sales – direct material – direct labor – variable expense.

**COST RECONCILIATION STATEMENT**

<table>
<thead>
<tr>
<th>Standard Cost</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Variance:</td>
<td></td>
</tr>
<tr>
<td>Adv</td>
<td>Fav</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Actual Cost</td>
<td>XXX</td>
</tr>
</tbody>
</table>

1. Favorable – LESS
2. Adverse = ADD
3. It includes only cost variance.

**PROFIT RECONCILIATION STATEMENT**

<table>
<thead>
<tr>
<th>Budgeted Profit</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale Variance:</td>
<td></td>
</tr>
<tr>
<td>Adv</td>
<td>Fav</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Cost Variance:</td>
<td></td>
</tr>
<tr>
<td>Adv</td>
<td>Fav</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Actual Cost</td>
<td>XXX</td>
</tr>
</tbody>
</table>

1. Favorable – ADD
2. Adverse = LESS
3. It includes cost & sales variance.
## PROFIT RECONCILIATION STATEMENT (FOR MARGINAL COSTING)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Profit</td>
<td>XXX</td>
</tr>
<tr>
<td>Add- Budgeted Fixed Cost</td>
<td>XXX</td>
</tr>
<tr>
<td>Budgeted Contribution</td>
<td>XXX</td>
</tr>
<tr>
<td><strong>Sale Variance:</strong></td>
<td></td>
</tr>
<tr>
<td>Adv</td>
<td>Fav</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Actual Contribution</td>
<td>XXX</td>
</tr>
</tbody>
</table>

**Cost Variance:**

<table>
<thead>
<tr>
<th>Adv</th>
<th>Fav</th>
</tr>
</thead>
<tbody>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>XXX</td>
<td>XXX</td>
</tr>
</tbody>
</table>
Standard Mix = 400

<table>
<thead>
<tr>
<th>Weight</th>
<th>SR per kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>30</td>
</tr>
<tr>
<td>B</td>
<td>25</td>
</tr>
</tbody>
</table>

Actual Mix = 192

<table>
<thead>
<tr>
<th>Weight</th>
<th>AR per kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>16</td>
</tr>
<tr>
<td>B</td>
<td>13</td>
</tr>
</tbody>
</table>

Standard quantity allowed will be calculated as follows:

If Standard Mix/Production = 400 Then standard quantity = 30
If Actual Mix/Production = 192 Then standard quantity allowed = 

the formula will be: \[
\frac{\text{Actual Mix/Production}}{\text{Standard Mix/Production}} \times \text{Individual Standard quantity}
\]

\[
\begin{align*}
\text{A} & \quad 192 \times 30 = 14.4 \\
& \quad 400 \\
\text{B} & \quad 192 \times 25 = 12 \\
& \quad 400
\end{align*}
\]
### Standard Mix = 1000

<table>
<thead>
<tr>
<th></th>
<th>Weight</th>
<th>SR per kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>450</td>
<td>20</td>
</tr>
<tr>
<td>B</td>
<td>400</td>
<td>40</td>
</tr>
<tr>
<td>C</td>
<td>250</td>
<td>60</td>
</tr>
</tbody>
</table>

1100

**Loss** 100

### Actual Mix = 20000

<table>
<thead>
<tr>
<th></th>
<th>Weight</th>
<th>AR per kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10000</td>
<td>19</td>
</tr>
<tr>
<td>B</td>
<td>8500</td>
<td>42</td>
</tr>
<tr>
<td>C</td>
<td>4500</td>
<td>65</td>
</tr>
</tbody>
</table>

Standard quantity allowed will be calculated as follows:

If Standard Mix/Production = 1000

If Actual Mix/Production = 20000

Then standard quantity allowed = ?

The formula will be:

\[
\text{Actual Mix/Production} \times \frac{\text{Total Standard quantity}}{\text{Standard Mix/Production LESS any Loss}}
\]

\[
\frac{20000 \times 1100}{1000} = 22000
\]

**Note that in loss case, we will take total standard quantity. We will not take individual standard qty**

THIS above 22000 is total unit which will be allocated as follows:

A \[22000 \times \frac{450}{1100} = 9000\]

B \[22000 \times \frac{400}{1100} = 8000\]

C \[22000 \times \frac{250}{1100} = 5000\]

\[
\boxed{22000}
\]
Standard Mix = 1900

<table>
<thead>
<tr>
<th>Weight</th>
<th>SR per kg</th>
<th>Rs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1000</td>
<td>10</td>
</tr>
<tr>
<td>B</td>
<td>600</td>
<td>12</td>
</tr>
<tr>
<td>C</td>
<td>400</td>
<td>14</td>
</tr>
</tbody>
</table>

Loss 100

1900

Actual Mix = THIS WILL NEVER BE GIVEN IN QUESTION.

<table>
<thead>
<tr>
<th>Opening Stock</th>
<th>Purchases</th>
<th>Closing Stock</th>
<th>Consumption</th>
<th>AR per kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>200</td>
<td>1200</td>
<td>300</td>
<td>1100</td>
</tr>
<tr>
<td>B</td>
<td>100</td>
<td>800</td>
<td>200</td>
<td>700</td>
</tr>
<tr>
<td>C</td>
<td>400</td>
<td>700</td>
<td>500</td>
<td>600</td>
</tr>
</tbody>
</table>

Wastage of 200 is also occurred.

Standard quantity allowed will be calculated as follows:

If Standard Mix/Production = 1900
Then individual standard cost = 10000

If Actual Mix/Production = 2400
Then standard quantity allowed = ?

the formula will be: Actual Mix/Production * Individual Standard Cost

Standard Mix/Production LESS any Loss

A 2400 - 200 * 10000 = 11578

B 2400 - 200 * 7200 = 8336

C 2400 - 200 * 5600 = 6484

Note that we will take Individual standard cost in this case.
### MATERIAL MIX VARIANCES ILLUSTRATION

**Standard Mix =** 1000 kg

<table>
<thead>
<tr>
<th></th>
<th>Qty</th>
<th>SR per kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>450</td>
<td>20</td>
</tr>
<tr>
<td>B</td>
<td>400</td>
<td>40</td>
</tr>
<tr>
<td>C</td>
<td>250</td>
<td>60</td>
</tr>
</tbody>
</table>

1100

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10000</td>
<td>19</td>
</tr>
<tr>
<td>B</td>
<td>8500</td>
<td>42</td>
</tr>
<tr>
<td>C</td>
<td>4500</td>
<td>65</td>
</tr>
</tbody>
</table>

Material Price Variance = \[\text{Actual Qty (AR-SR)}\]

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10000</td>
<td>19</td>
</tr>
<tr>
<td>B</td>
<td>8500</td>
<td>42</td>
</tr>
<tr>
<td>C</td>
<td>4500</td>
<td>65</td>
</tr>
</tbody>
</table>

Material Mix Variance = \[\text{SR (Actual Qty at Actual Mix - Actual Qty at Standard Mix)}\]

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>20 (10000 - 9409) =</td>
<td>11820 (A)</td>
</tr>
<tr>
<td>B</td>
<td>40 (8500 - 8363) =</td>
<td>5480 (A)</td>
</tr>
<tr>
<td>C</td>
<td>60 (4500 - 5227) =</td>
<td>43620 (F)</td>
</tr>
</tbody>
</table>

Actual Qty at Standard Mix is calculated as follows:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>23000 * 450 / 1100 =</td>
<td>9409</td>
</tr>
<tr>
<td>B</td>
<td>23000 * 400 / 1100 =</td>
<td>8363</td>
</tr>
<tr>
<td>C</td>
<td>23000 * 250 / 1100 =</td>
<td>5227</td>
</tr>
</tbody>
</table>
### Material Yield Variance

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard Quantity</th>
<th>Actual Quantity</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>20 (9409 - 9000)</td>
<td>8180 (A)</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>40 (8363 - 8000)</td>
<td>14520 (A)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>60 (5227 - 5000)</td>
<td>13620 (A)</td>
<td>36320 (A)</td>
</tr>
</tbody>
</table>

Standard Qty Allowed is calculated as follows:

<table>
<thead>
<tr>
<th>If Standard Mix/Production =</th>
<th>Standard Qty Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>450</td>
</tr>
<tr>
<td>20000</td>
<td>?</td>
</tr>
</tbody>
</table>

The formula will be:

\[ \text{Actual Mix/Production} \times \text{Individual Standard quantity} \]

\[
\begin{align*}
\text{A} & : 20000 \times 450 = 9000 \\
& : 1000 \\
\text{B} & : 20000 \times 400 = 8000 \\
& : 1000 \\
\text{C} & : 20000 \times 200 = 5000 \\
& : 1000
\end{align*}
\]

### Material Usage Variance

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard Quantity</th>
<th>Actual Quantity</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>20 (10000 - 9000)</td>
<td>20000 (A)</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>40 (8500 - 8000)</td>
<td>20000 (A)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>60 (4500 - 5000)</td>
<td>30000 (F)</td>
<td>10000 (A)</td>
</tr>
</tbody>
</table>

\[ \text{Material Usage Variance} = \left( \text{Material Mix Variance} + \text{Material Yield Variance} \right) \]

\[ 26320 \times 36320 \times A = 10000 \times A \]

### Material Cost Variance

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

\( = (10000 \times 19) - (9000 \times 20) \)

\( = (8500 \times 42) - (8000 \times 40) \)

\( = (4500 \times 65) - (5000 \times 60) \)

\[ = (190000 + 357000 + 292500) - (180000 + 320000 + 300000) \]

\[ = 839500 - 800000 = 39500 (A) \]

\[ \text{OR} \]

\[ \text{Material Cost Variance} = \left( \text{Material Price Variance} + \text{Material Usage Variance} \right) \]

\[ 29500 (A) + 10000 (A) = 39500 (A) \]
### SALE MIX VARIANCES ILLUSTRATION

#### Budgeted sales is as follows:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>800 units @ 100 per unit</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>700 units @ 200 per unit</td>
<td></td>
</tr>
</tbody>
</table>

#### Actual sales is as follows:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>900 units @ 110 per unit</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>800 units @ 180 per unit</td>
<td></td>
</tr>
</tbody>
</table>

#### Cost per unit:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>80</td>
</tr>
<tr>
<td>B</td>
<td>170</td>
</tr>
</tbody>
</table>

#### Calculate sales variances.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Price Variance =</td>
<td>Actual Qty (AR-SR)</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>900 (110-100) = 9000 (F)</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>800 (180-200) = 16000 (A)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7000 (A)</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Mix Variance =</td>
<td>SR of Gross Profit (Actual Qty at Actual Mix - Actual Qty at Standard Mix)</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>20 (900-907) = 140 (A)</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>30 (800-793) = 210 (F)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>70 (F)</td>
<td></td>
</tr>
</tbody>
</table>

#### Actual Qty at Standard Mix is calculated as follows:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1700 * 800/1500 = 907</td>
</tr>
<tr>
<td>B</td>
<td>1700 * 700/1500 = 793</td>
</tr>
</tbody>
</table>

#### SR of Gross Profit is calculated as follows:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Sales - Standard Cost</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>100 - 80 = 20</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>200 - 170 = 30</td>
<td></td>
</tr>
</tbody>
</table>

#### AR of Gross Profit is calculated as follows:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Volume Variance =</td>
<td>SR of Gross Profit (Actual Qty at Standard Mix - Budgeted Qty)</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>20 (907 - 800) = 2140 (F)</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>30 (793 - 700) = 2790 (F)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4930 (F)</td>
<td></td>
</tr>
</tbody>
</table>

#### Sales Usage Variance =

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SR of Gross Profit (Actual Qty at Actual Mix - Budgeted Qty)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>20 (900 - 800) = 2000 (F)</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>30 (800 - 700) = 3000 (F)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5000 (F)</td>
<td></td>
</tr>
</tbody>
</table>
MATERIAL COSTING

MATERIAL COSTING METHODS

• First in first out (FIFO)
• Last in last out (LIFO)
• Highest in first out (HIFO)
• Standard Costing (SC) = Quantity issued * standard cost
• Replacement Costing (RC) = Quantity issued * replacement cost
• Average Costing (AVCO)

1. Cumulative Average Costing (CAC) = normal method that we use.
2. Periodic Average Costing (PAC)

Cost of unit received + cost of opening stock / No of unit received + no of opening stock
= answer * quantity issued (individual) XXX
Less- Cost of unit received + cost of opening stock XXX
Value of Closing stock XXX

LIFO VS FIFO COMPARISON

<table>
<thead>
<tr>
<th>Method</th>
<th>Price</th>
<th>Income Statement Effect</th>
<th>Balance Sheet Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CGS</td>
<td>NI</td>
</tr>
<tr>
<td>LIFO</td>
<td>Increase</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>FIFO</td>
<td>Increase</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>LIFO</td>
<td>Decrease</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>FIFO</td>
<td>Decrease</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Method</th>
<th>Price</th>
<th>Income Statement Effect</th>
<th>Balance Sheet Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>FIFO</td>
<td>LIFO</td>
</tr>
<tr>
<td>COGS consists of</td>
<td>First purchased</td>
<td>Last purchased</td>
<td>Average cost of all item</td>
</tr>
<tr>
<td>Ending Inv. consists of</td>
<td>Most recent purchase</td>
<td>Earliest purchase</td>
<td>Average cost of all item</td>
</tr>
</tbody>
</table>
INVENTORY VALUATION METHODS

- Cost
- Sale price
- Lower of cost or market value
- Lower of cost or net realizable value
- Lower of cost or replacement value

FORMULAE

<table>
<thead>
<tr>
<th>Total Material Turnover:</th>
<th>Material Used/Average Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finished Goods Turnover:</td>
<td>Finished Goods Sold/Average Material</td>
</tr>
<tr>
<td>Average Material:</td>
<td>Opening stock + Closing stock/2</td>
</tr>
<tr>
<td>Day Requirement in Average Inventory:</td>
<td>365 / Turnover ratio</td>
</tr>
<tr>
<td>Date before Next Order:</td>
<td>Frequency</td>
</tr>
<tr>
<td></td>
<td>Day Supply left = unit in inventory / EOQ * Frequency</td>
</tr>
<tr>
<td></td>
<td>Next Order : Supply Left – Lead Time</td>
</tr>
</tbody>
</table>

LOWER OF COST & MARKET VALUE

<table>
<thead>
<tr>
<th>CASE</th>
<th>COST</th>
<th>MARKET</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Replacement Cost</td>
<td>NRV/Ceiling</td>
</tr>
<tr>
<td>XX</td>
<td>XX</td>
<td>XX</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

STORE LEDGER CARD

M/S ...............  

Store ledger card / bin card

<table>
<thead>
<tr>
<th>DATE</th>
<th>RECEIVED</th>
<th>ISSUED</th>
<th>BALANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unit</td>
<td>U.P.</td>
<td>Amount</td>
</tr>
<tr>
<td>XX</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XX-XX-200X</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
</tr>
<tr>
<td>XX</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XX-XX-200X</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
</tr>
</tbody>
</table>

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### DEFECTIVE UNITS

<table>
<thead>
<tr>
<th>SPECIFIC (WIP)</th>
<th>ENTIRE (FOH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in Process – Material</td>
<td>Work in Process – Material</td>
</tr>
<tr>
<td>Work in Process – Labor</td>
<td>Work in Process – Labor</td>
</tr>
<tr>
<td>Work in Process – FOH Material</td>
<td>Work in Process – FOH Material</td>
</tr>
<tr>
<td>Labor</td>
<td>Work in Process – FOH Labor</td>
</tr>
<tr>
<td>Factory Over Head</td>
<td>Work in Process – FOH Factory Over Head</td>
</tr>
<tr>
<td>Work in Process – Material</td>
<td>Factory Over Head</td>
</tr>
<tr>
<td>Work in Process – Labor</td>
<td>Material</td>
</tr>
<tr>
<td>Work in Process – FOH Material</td>
<td>Labor</td>
</tr>
<tr>
<td>Labor</td>
<td>Factory Over Head</td>
</tr>
<tr>
<td>Factory Over Head</td>
<td></td>
</tr>
</tbody>
</table>

### SPOILAGE UNITS

<table>
<thead>
<tr>
<th>SPECIFIC (WIP)</th>
<th>ENTIRE (FOH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in Process – Material</td>
<td>Work in Process – Material</td>
</tr>
<tr>
<td>Work in Process – Labor</td>
<td>Work in Process – Labor</td>
</tr>
<tr>
<td>Work in Process – FOH Material</td>
<td>Work in Process – FOH Material</td>
</tr>
<tr>
<td>Labor</td>
<td>Work in Process – FOH Labor</td>
</tr>
<tr>
<td>Factory Over Head</td>
<td>Work in Process – FOH Factory Over Head</td>
</tr>
<tr>
<td>Spoiled Goods</td>
<td>Work in Process – Material</td>
</tr>
<tr>
<td>Factory Over Head</td>
<td>Work in Process – Labor</td>
</tr>
<tr>
<td>Work in Process – Material</td>
<td>Work in Process – FOH</td>
</tr>
<tr>
<td>Work in Process – Labor</td>
<td></td>
</tr>
<tr>
<td>Work in Process – FOH Material</td>
<td></td>
</tr>
<tr>
<td>Factory Over Head</td>
<td></td>
</tr>
<tr>
<td>(Cost of Spoilage = DM+DL+FOH – Spoilage Scrap)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Finished Goods</th>
<th>Finished Goods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in Process – Material</td>
<td>Work in Process – Material</td>
</tr>
<tr>
<td>Work in Process – Labor</td>
<td>Work in Process – Labor</td>
</tr>
<tr>
<td>Work in Process – FOH Material</td>
<td>Work in Process – FOH Material</td>
</tr>
<tr>
<td>Labor</td>
<td>Work in Process – FOH Labor</td>
</tr>
<tr>
<td>Factory Over Head</td>
<td>Work in Process – FOH Factory Over Head</td>
</tr>
</tbody>
</table>

(Cost of Spoilage = DM+DL+FOH – Spoilage Scrap)
**Spoilage Calculation**

<table>
<thead>
<tr>
<th>SPECIFIC (WIP)</th>
<th>ENTIRE (FOH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovery</td>
<td>Recovery + loss</td>
</tr>
</tbody>
</table>

- Per unit cost change
  - FG cost: Total cost + Additional cost – Spoilage cost
  - FG cost: Total cost – Spoilage cost

- Spoilage distribution:
  - Specific (WIP): Spoilage cost / total cost * 100
  - Entire (FOH): Particular cost / unit made * 100

**Inventory Controls**

<table>
<thead>
<tr>
<th>WITHOUT SAFETY STOCK</th>
<th>WITH SAFETY STOCK</th>
</tr>
</thead>
</table>
| **Order Level / Point / Re-Order Level:** | Maximum usage during lead time  
OR  
Maximum usage * Max lead time |
| | Normal /Average usage during lead time + Safety Stock  
OR  
(Normal /Average usage * lead time) + Safety Stock |

| **Minimum Level / Sock / Point / Buffer Level** | Order Level - Normal /Average usage during lead time  
OR  
Order Level – (Normal /Average usage * lead time)  
OR  
(Maximum daily usage - Normal /Average daily usage) * lead time |
| | - |

| **Maximum Level / Stock / Point** | Order Level + EOQ - Minimum usage during lead time  
OR  
Order Level + EOQ – (Minimum daily usage * lead time) |
| | Order Level + EOQ - Normal /Average usage during lead time  
OR  
EOQ + Safety Stock |

| **Safety Stock:** | (Maximum Usage – Average Usage) * lead time |
| **Average Stock Level:** | ½ (Minimum Level + Maximum level)  
OR  
½ (Opening Stock + Closing Stock) |
| | EOQ/2 + Safety Stock |

| **Danger Level** | Normal /Average usage during lead time for urgent supply  
OR  
Normal /Average daily usage * lead time for urgent supply |

---

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ECONOMIC ORDER QUANTITY

$$\text{EOQ} = \sqrt{2 \times \text{AR} \times \text{OC} \times \text{CC} + \text{I} \times \text{P.U.}}$$

<table>
<thead>
<tr>
<th>Number of Orders</th>
<th>NO : AR / EOQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Ordering Cost</td>
<td>TOC : ON * TOC</td>
</tr>
<tr>
<td>Average Inventory</td>
<td>UAI : EOQ / 2</td>
</tr>
<tr>
<td>Total Carrying Cost</td>
<td>TCC : UAI * TCC</td>
</tr>
<tr>
<td>Frequency of Orders</td>
<td>365 / NO</td>
</tr>
</tbody>
</table>

This formula is based on three assumptions:

1. Price will remain constant throughout the year and quantity discount is not involved.
2. Pattern of consumption, variable ordering costs per order and variable inventory carrying charge per unit per annum will remain the same throughout, and
3. EOQ will be delivered each time the stock balance is just reduced to nil.

ECONOMIC BATCH QUANTITY/EBQ/AMENDED ECONOMIC ORDER QUANTITY

$$\text{EOQ} = \sqrt{2 \times \text{CD} \times \text{H} \times (1 - \frac{\text{D}}{\text{R}})}$$

<table>
<thead>
<tr>
<th>C</th>
<th>Setup Cost.</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Annual Demand.</td>
</tr>
<tr>
<td>H</td>
<td>Holding Cost.</td>
</tr>
<tr>
<td>R</td>
<td>Production Rate per time period.</td>
</tr>
</tbody>
</table>

SAVINGS CALCULATION

<table>
<thead>
<tr>
<th></th>
<th>EXISTING</th>
<th>NEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering Cost</td>
<td>AR * OC / EOQ</td>
<td>AR * OC / EOQ</td>
</tr>
<tr>
<td>Carrying Cost</td>
<td>CC * I * PU * EOQ / 2</td>
<td>CC * I * PU * EOQ / 2</td>
</tr>
<tr>
<td>Purchase Cost</td>
<td>Unit made * per unit cost</td>
<td>Unit made * per unit cost</td>
</tr>
<tr>
<td></td>
<td>xxx</td>
<td>xxx</td>
</tr>
<tr>
<td>SAVINGS</td>
<td>Difference of Existing &amp; New</td>
<td></td>
</tr>
</tbody>
</table>

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1. Factory cost
   Contribution required = (FC + TP / total limiting factor hrs * limiting factor hr) = XXX
   PRICE = XXX

2. Lowest price: Basic unit + Net Profit – Opening Profit / Capacity

**INVENTORY ASSOCIATED COST**

- Annual purchase cost = Irrelevant
- Annual ordering cost = Relevant
- Annual carrying cost = Relevant

**COMPONENT OF PURCHASE COST**

1. Invoice price
2. Discount
3. Insurance in transit
4. Commission or brokerage
5. Purchase related taxes & duties (non refundable & non adjustable)
6. Transportation cost if constant per unit
7. Non returnable container & packing

**COMPONENT OF ORDERING COST**

1. Clerical cost per order
2. Inspection cost per order
3. Transportation cost if constant per order

**COMPONENT OF CARRYING COST (HOLDING COST / STORAGE COST)**

1. Insurance
2. Wastage
3. Material handling cost
4. Storage charged if constant per order
5. Interest / working capital cost

<table>
<thead>
<tr>
<th>DM</th>
<th>EOQ</th>
<th>= Raw Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIP</td>
<td>EBQ</td>
<td>= Production</td>
</tr>
<tr>
<td>FG</td>
<td>Working Capital Management = Store</td>
<td></td>
</tr>
<tr>
<td>DEBTORS</td>
<td></td>
<td>Debtor Management</td>
</tr>
<tr>
<td>CASH</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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ABC ANALYSIS

1. Pareto analysis
2. 80:20 rule
3. Always better control
4. Alphabetical approach to inventory management
5. Selective inventory management
6. C.I.E. i.e. Control by importance & exception
7. V.E.D. i.e. Vital, Desirable, Essential

INVENTORY MANAGEMENT

- Reorder level system
- 2 bin under reorder level system
- Periodic review system

- EOQ
- Reorder
- Normal max
- Absolute max
- Safety stock / buffer / Min stock

INVENTORY RECORDING SYSTEM

<table>
<thead>
<tr>
<th>1. Periodic system</th>
<th>2. Perpetual system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under this system, the value of inventory is determined at the end of the year through a physical count of inventory in store/warehouse. It does not maintain a continuous record of movement of each inventory item.</td>
<td>Under this system, a complete and continuous record of movement of each inventory item is maintained. Perpetual records are useful in preparing monthly quarterly or other financial statement. Record used is normally a “store ledger card” specifying quantity wise receipt, issue and balance together with values in chronological sequence.</td>
</tr>
</tbody>
</table>

TWO BIN SYSTEM

- First bin = over & above reorder level
- Second bin = reorder level
**EOQ**

\[
\text{Annual ordering cost} = \frac{\text{Annual carrying cost}}{2}
\]

\[
\frac{\text{AD} \times \text{OC}}{\text{EOQ}} = \frac{\text{EOQ} \times \text{CC}}{2} \quad \text{OR} \quad \frac{\text{EOQ}^2}{2} = \text{AD} \times \frac{\text{OC}}{\text{CU}} \times \text{CC}\%
\]

\[
\text{EOQ} = \sqrt{\frac{2 \times \text{AD} \times \text{OC}}{\text{CU} \times \text{CC}\%}}
\]

---

**AVERAGE CONSUMPTION**

<table>
<thead>
<tr>
<th>Normal Consumption</th>
<th>Normal Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening + closing / 2</td>
<td>1. Highest frequency</td>
</tr>
<tr>
<td></td>
<td>2. Consume most of time</td>
</tr>
</tbody>
</table>

---

1. Use normal consumption. If normal consumption not given, then use average consumption.
2. Consumption & lead time = base parameter will always be same
   1. DAY = DAY
   2. WEEK = WEEK

**STOCK OUT COST**

1. Restarting cost
2. Loss of goodwill & customers
3. Loss of contribution margin
4. Extra cost associated with emergency purchase
5. Consumption > Normal = Stock out costs occurs
6. Carrying cost of safety stock = safety stock unit * CC per unit
7. Note: CC will not be divided by 2 as it is not used on regular basis.
8. Stock out cost: 1 – Per time & 2 – Per unit

---

**ANNUAL DEMAND**

<table>
<thead>
<tr>
<th>Cash sales unit</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit sales unit</td>
<td>XXX</td>
</tr>
<tr>
<td>Total sales unit</td>
<td>XXX</td>
</tr>
<tr>
<td>Add – Closing FG</td>
<td>XXX</td>
</tr>
<tr>
<td>Less – Opening FG</td>
<td>(XXX)</td>
</tr>
<tr>
<td><strong>Required</strong></td>
<td>XXX</td>
</tr>
</tbody>
</table>
**Uncertainty to Certainty**

Formula for Certainty Equivalents: Uncertainty figure * probability

<table>
<thead>
<tr>
<th>Uncertainty figure</th>
<th>Probability</th>
<th>Certainty Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>700000</td>
<td>5%</td>
<td>75000</td>
</tr>
<tr>
<td>500000</td>
<td>70%</td>
<td>350000</td>
</tr>
<tr>
<td>200000</td>
<td>25%</td>
<td>25000</td>
</tr>
</tbody>
</table>

**EOQ vs EBQ**

<table>
<thead>
<tr>
<th></th>
<th>EOQ</th>
<th>EBQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Demand</td>
<td></td>
<td>Annual production</td>
</tr>
<tr>
<td>Carrying cost</td>
<td>Variable manufacturing cost per unit</td>
<td></td>
</tr>
<tr>
<td>CC%</td>
<td>CC%</td>
<td></td>
</tr>
<tr>
<td>Ordering cost</td>
<td>Set up cost per order</td>
<td></td>
</tr>
<tr>
<td>Reference to Raw Material</td>
<td>Reference to Finished Goods</td>
<td></td>
</tr>
</tbody>
</table>

**Free Stock Balance**

<table>
<thead>
<tr>
<th></th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical stock</td>
<td></td>
</tr>
<tr>
<td>Add – Outstanding purchase order</td>
<td>XXX</td>
</tr>
<tr>
<td>Less – Unfulfilled share requisition</td>
<td>(XXX)</td>
</tr>
<tr>
<td></td>
<td>XXX</td>
</tr>
</tbody>
</table>

**Danger Level**

1. Point below safety stock.
2. Represent limit at which emergency steps must be taken e.g. sending a man personally to bring the required material.

**Cost of Prediction Error**

<table>
<thead>
<tr>
<th></th>
<th>EXISTING</th>
<th>NEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering Cost</td>
<td>AR * OC / EOQ</td>
<td>AR * new OC / old EOQ</td>
</tr>
<tr>
<td>Carrying Cost</td>
<td>CC * I * PU * EOQ / 2</td>
<td>CC * I * PU * old EOQ / 2</td>
</tr>
<tr>
<td></td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>SAVINGS</td>
<td>Difference of Existing &amp; New</td>
<td></td>
</tr>
</tbody>
</table>
OTHER TYPES OF BEP

**Cash BEP**

In the Cash BEP, fixed cost taken at cash cost (only Cash cost). No non cash item will be considered. E.g. Depreciation, Amortization etc. Also called “Out of pocket fixed cost”. This BEP is used in slack period for short time.

**Composite BEP (Overall BEP)**

BEP in case of two or more than two products combined BEP for one company.

**Question:**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Unit A</th>
<th>Unit B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>Rs. 20</td>
<td>Rs. 45</td>
</tr>
<tr>
<td>Variable cost</td>
<td>Rs. 15</td>
<td>Rs. 30</td>
</tr>
<tr>
<td>Contribution</td>
<td>Rs. 05</td>
<td>Rs. 15</td>
</tr>
<tr>
<td>Sales mix</td>
<td>6000 Unit</td>
<td>4000 Unit</td>
</tr>
<tr>
<td>P/V Ratio</td>
<td>1/4</td>
<td>1/3</td>
</tr>
</tbody>
</table>

Product A and B sales different product at different price and product have different cost and different sales mix. Required to find combined BEP of company in Amount when fixed cost =360,000?

**Answer:**

**IN UNIT RATIO** – Avg. contribution per unit

\[
\frac{(5\times 6 + 15\times 4)}{10} = Rs. 9 \text{ per combo unit}
\]

\[
360,000/9 = 40,000 \text{ units}
\]

A: \(40000/10 \times 6 = 24000\), B: \(40000/10 \times 4 = 16000\)

**IN SALES RATIO** – Avg. P/V ratio per unit

\[
\frac{(5\times 6 + 15\times 4)}{(20\times 6 + 45\times 4)} = 30\%
\]

\[
360,000/30\% = 1200,000
\]

**BEP in case of opening stock**

**Question:**

Opening stock 6000 Unit @ Rs.10.00 (VC at 60%) = 60,000

Production 44000 Unit @ (fixed cost = 187000) = 484,000

Selling Price = Rs.10.50 in current year.

**Answer:**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Total Cost</th>
<th>Variable cost</th>
<th>Per U.</th>
<th>Fixed cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening stock</td>
<td>60,000</td>
<td>36,000</td>
<td>6.00</td>
<td>Not tr. In this year</td>
</tr>
<tr>
<td>Produce units</td>
<td>484,000</td>
<td>297,000</td>
<td>6.75</td>
<td>187,000</td>
</tr>
<tr>
<td>Contribution required for absorption of fixed cost</td>
<td>= Rs. 187,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contribution earn by opening units 6,000 *(10.5-6) = Rs. 27,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balance contribution</td>
<td>= Rs. 160,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>= 160,000/3.75 = 42,667</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>= Total sale of units = 6,000+42,667 = 48,667.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### BEP in Case of Change in Variable Cost at Various Levels of Production

**Question:** First 5000 Units @ Rs. 3.00 - Contribution 2.00  
Next Units @ Rs. 2.80 - Contribution 2.20  
Sales price = Rs. 5.00 and fixed cost = Rs. 27500  
**Answer:** 5,000 + 12,500 = 17,500

### BEP in Case of Differential Fixed Cost at Differential Production Levels

**Question:** Sales price = 20.00 and VC = 15.00  
Fixed cost, Rs. 30,000 up to 8000 units and Rs. 45000 above 8000 Unit.  
**Answer:**  
BEP up to 8000 units: 30,000/5 = 6,000 units  
BEP above 8000 units: 45,000/5 = 9,000 units.

### Cost BEP

It is used for profit earning capacity after a specific level of production.  
**Question:**  
<table>
<thead>
<tr>
<th>Particulars</th>
<th>Plant A</th>
<th>Plant B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable cost (per unit)</td>
<td>8.00</td>
<td>6.50</td>
</tr>
<tr>
<td>Fixed cost</td>
<td>90,000</td>
<td>120,000</td>
</tr>
</tbody>
</table>

Which is more profitable and state the level in units and compare the cost per unit when production is 15000 units or 25000 units?  
**Answer:** (120,000-90,000) / (8.00-6.50) = 20,000 Units.

### BEP in Case of Semi Variable Cost

**Question:**  
Engine fixed cost = 32,000, Train bogie Fixed cost = 12,000  
Capacity = 60 persons per bogie, Ticket Contribution = Rs. 300  
Determine the BEP in Bogie number and in persons?  
**Answer:**  
Contribution per bogie = 300*60 – 12000 = 6,000.00  
Bogie required for BEP = 32,000 / 6000 = 5.3333 or 6.00  
BEP tickets = 104,000 / 300 = 347 tickets

### Profit BEP

**IN AMOUNT:** (Fixed cost + Desired profit) / PV ratio  
**IN UNIT:** (Fixed cost + Desired profit) / Contribution per unit

### BEP in Case of Merger of Plants/Company

**Question:**  
<table>
<thead>
<tr>
<th>Particulars</th>
<th>Plant A</th>
<th>Plant B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working capacity</td>
<td>70%</td>
<td>60%</td>
</tr>
<tr>
<td>Sales</td>
<td>350</td>
<td>240</td>
</tr>
<tr>
<td>VC</td>
<td>280</td>
<td>180</td>
</tr>
<tr>
<td>Contribution</td>
<td>70</td>
<td>60</td>
</tr>
<tr>
<td>Fixed cost</td>
<td>50</td>
<td>45</td>
</tr>
<tr>
<td>Profit</td>
<td>20</td>
<td>15</td>
</tr>
</tbody>
</table>

1. Find out the combined BEP of company?  
2. Find out profit/loss at 50% capacity?  
**Answer:**  
(1) Fixed cost = 50.00 + 45.00 = 95.00
### Capacity at 100%

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>500</td>
<td>400</td>
<td>900</td>
</tr>
<tr>
<td>Less: VC (100%)</td>
<td>400</td>
<td>300</td>
<td>700</td>
</tr>
<tr>
<td>Contribution</td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
<td><strong>200</strong></td>
</tr>
</tbody>
</table>

Common P/V ratio = \((200/900) \times 100 = 22.22\%\)

Sales value on BEP = \(95/22.22\% = \text{Rs.}427.50\)

### At 50% capacity

Sales (900 * 50%) = 450

Contribution (450 * 22.22%) = 100

Less : Fixed cost = 95

Profit = 5

---

### MULTI PRODUCT PROFIT STATEMENT

<table>
<thead>
<tr>
<th></th>
<th>XX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale</td>
<td>XX</td>
</tr>
<tr>
<td>Less - VC</td>
<td>XX</td>
</tr>
<tr>
<td>Contribution</td>
<td>XX</td>
</tr>
<tr>
<td>Less – Specific Fixed Cost</td>
<td>XX</td>
</tr>
<tr>
<td>Total</td>
<td>XX</td>
</tr>
<tr>
<td>Less- General Fixed Cost</td>
<td>XX</td>
</tr>
<tr>
<td>Profit</td>
<td>XX</td>
</tr>
</tbody>
</table>
## FACTORY OVERHEAD

### OVERALL VARIANCE / TOTAL VARIANCE / OVER OR UNDER APPLIED FOH

<table>
<thead>
<tr>
<th>Description</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual FOH (Fixed + Variable)</td>
<td>XXX</td>
</tr>
<tr>
<td>Applied FOH (Actual capacity attained * FOH Applied Rate)</td>
<td>(XXX)</td>
</tr>
<tr>
<td>Under / Over Applied</td>
<td>XXX</td>
</tr>
</tbody>
</table>

**FOH Applied Rate**: Estimated FOH/Estimated Capacity level

**Under applied/ Dr/ Unfavorable & Over applied/ Cr/ Favorable**

### CAPACITY / VOLUME VARIANCE

<table>
<thead>
<tr>
<th>Description</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied FOH</td>
<td>XXX</td>
</tr>
<tr>
<td>Budgeted GOH for capacity attained (Fixed FOH + Actual capacity attained * FOH variable rate)</td>
<td>(XXX)</td>
</tr>
<tr>
<td></td>
<td>XXX</td>
</tr>
</tbody>
</table>

**FOH Variable Rate**: Estimated Variable FOH/Estimated Capacity level

### SPENDING/ BUDGETED / EXPENDITURE

<table>
<thead>
<tr>
<th>Description</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted FOH for Capacity Attained</td>
<td>XXX</td>
</tr>
<tr>
<td>Actual FOH</td>
<td>(XXX)</td>
</tr>
<tr>
<td></td>
<td>XXX</td>
</tr>
</tbody>
</table>

### FORMULAE

<table>
<thead>
<tr>
<th>Description</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed FOH</td>
<td>Estimated Total FOH – Variable FOH</td>
</tr>
<tr>
<td>Total FOH</td>
<td>Fixed FOH + Variable FOH</td>
</tr>
<tr>
<td>FOH applied rate (if variable FOH is given)</td>
<td>Fixed FOH/Estimated capacity + Variable rate</td>
</tr>
<tr>
<td>Budgeted volume/ normal capacity / standard activity level</td>
<td>Fixed FOH/Fixed FOH rate (Total rate – Variable rate)</td>
</tr>
<tr>
<td>Variable FOH Rate</td>
<td>Change in budgeted FOH/Change in activity level</td>
</tr>
<tr>
<td>Budgeted Fixed FOH</td>
<td>Total budgeted FOH - Variable FOH (Budgeted volume * variable rate)</td>
</tr>
<tr>
<td>Fixed Cost</td>
<td>Variable FOH + Budgeted fixed FOH</td>
</tr>
<tr>
<td>Budgeted FOH</td>
<td>Fixed cost + Variable cost (Budgeted volume * variable rate)</td>
</tr>
<tr>
<td>Cost of Unused Capacity</td>
<td>Estimated fixed FOH – Fixed FOH Applied</td>
</tr>
<tr>
<td>Stages of absorption costing</td>
<td>Allocation + Apportionment + Absorption</td>
</tr>
<tr>
<td>Blanket / Plant wide/ Single Rate</td>
<td>Total FOH of the factory/Total activity level of the factory</td>
</tr>
<tr>
<td>Departmental Rate</td>
<td>Total FOH of deptt/Total activity level of the deptt</td>
</tr>
</tbody>
</table>
### Actual Rate

- Total Actual FOH/Total actual activity level

### Bases of Activity Level

- (1) - Machine Hour
- (2) - Quantity
- (3) - Prime cost
- (4) - DM cost
- (5) - DL cost
- (6) - DL hours

### Actual Costing

- Actual Direct Material Cost + Actual Direct Labor Cost + Actual Direct Expenses Cost + Actual FOH Cost

### Normal Costing

- Actual Direct Material Cost + Actual Direct Labor Cost + Actual Direct Expenses Cost + Applied FOH Cost

### Under/Over applied Decision Rule

- **NOPU**
  - ( Negative = Over applied & Positive = Under applied)

### Reason of Under/Over applied

1. Actual Overhead costs are different from budgeted overhead
2. Actual Overhead activity levels are different from budgeted overhead
3. Actual Overhead costs & activity levels are different from budgeted overhead

## Accounting Treatment

<table>
<thead>
<tr>
<th></th>
<th>Absorption Costing</th>
<th>Marginal Costing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prime Cost</strong></td>
<td>Product Cost</td>
<td>Product Cost</td>
</tr>
<tr>
<td><strong>Variable FOH</strong></td>
<td>Product Cost</td>
<td>Product Cost</td>
</tr>
<tr>
<td><strong>Fixed FOH</strong></td>
<td>Product Cost</td>
<td>Period Cost</td>
</tr>
<tr>
<td><strong>Admin – Variable</strong></td>
<td>Period Cost</td>
<td>Period Cost</td>
</tr>
<tr>
<td><strong>Admin – Fixed</strong></td>
<td>Period Cost</td>
<td>Period Cost</td>
</tr>
<tr>
<td><strong>Selling – Variable</strong></td>
<td>Period Cost</td>
<td>Period Cost</td>
</tr>
<tr>
<td><strong>Selling – Fixed</strong></td>
<td>Period Cost</td>
<td>Period Cost</td>
</tr>
</tbody>
</table>

## Pre-Determined FOH Rate

### Based on Actual Capacity Attained:

- Estimated FOH at actual capacity attained
- Estimated Capacity level at actual capacity attained

### Based on Normal Capacity:

- Estimated FOH at normal capacity
- Estimated Capacity level at normal capacity

### Estimated FOH at normal capacity

- Fixed Expected actual capacity + normal capacity hours * variable rate

### Variable Rate:

- Variable Actual Capacity Attained/Actual Capacity Attained Hours
### Idle/Rate/Theoretical Capacity

1 - Estimated running = 24 hr a day, 365 days in a year
2 - Estimated machine hour = 24*365*10 = 87600 Machine Hours

### Practical Capacity

1 - Estimated running = 20 hr a day, 5 days per week, 50 weeks per year
2 - Estimated machine hour = 20*5*50*10 = 50000 Machine Hours

### Normal/Budgeted Capacity

1 - Used for long run planning.
2 - Foresee capacity
3 - Based upon past experience considering present circumstances.

### Expected Actual Capacity

Used for short run planning. E.g. seasonal.

### High/Low Analysis

**Step 1**
Take the activity level and cost for:
- The highest activity level
- The lowest activity level.

**Step 2**
The difference between the total cost of the highest activity level and the total cost of the lowest activity level consists entirely of variable costs. This is because the fixed costs are the same at all levels of activity.

<table>
<thead>
<tr>
<th>Activity level</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>High (A)</td>
<td>Total cost of A</td>
</tr>
<tr>
<td>Low (B)</td>
<td>Total cost of B</td>
</tr>
</tbody>
</table>

Difference: \((A - B)\) units

- From this difference, we can therefore calculate the variable cost per unit of activity.
- **Variable cost per unit** = \(\frac{(TC of A - TC of B)}{(A - B)\ units}\)

**Step 3**
Having calculated the variable cost per unit, apply this value to the cost of either the highest or the lowest activity level. (It does not matter whether you use the high level or the low level of activity. Your calculation of fixed costs will be the same.) Calculate the total variable costs at this activity level.

**Step 4**
The difference between the total cost at this activity level and the total variable cost at this activity level is the fixed cost.

Substitute in the ‘low’ equation

<table>
<thead>
<tr>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>$</td>
</tr>
<tr>
<td>Total cost of (low volume of activity) (TC of B)</td>
</tr>
<tr>
<td>Variable cost of (low volume of activity) (V)</td>
</tr>
<tr>
<td>Therefore fixed costs per period of time (TC of B - V)</td>
</tr>
</tbody>
</table>

You now have an estimate of the variable cost per unit and the total fixed costs.
# Responsibility Centers

<table>
<thead>
<tr>
<th></th>
<th>Cost Center</th>
<th>Profit Center</th>
<th>Investment Center</th>
<th>Revenue Center</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What is it?</strong></td>
<td>Part of the business for which costs are identified &amp; recorded.</td>
<td>Part of the business for which costs incurred &amp; revenue earned are identified &amp; recorded.</td>
<td>Part of the business for which profits &amp; capital employed are measured.</td>
<td>Part of the business for which revenue earned are identified &amp; recorded.</td>
</tr>
<tr>
<td><strong>Where might it be found?</strong></td>
<td>Production or service location, function, activity, item of equipment</td>
<td>Division of large organizations. May include several cost &amp; revenue centers.</td>
<td>Business units of large organizations.</td>
<td>Sale divisions.</td>
</tr>
<tr>
<td><strong>How is performance measured?</strong></td>
<td>Have cost targets been achieved?</td>
<td>What profit has been made by the center?</td>
<td>ROCE</td>
<td>What revenue has been earned?</td>
</tr>
<tr>
<td><strong>What are the manager’s information needs?</strong></td>
<td>Cost incurred &amp; charged to cost centers.</td>
<td>Information about costs &amp; revenues allocated to the profit center.</td>
<td>Information about costs, revenues &amp; capital employed to the investment center.</td>
<td>Sale revenue earned by individual revenue center.</td>
</tr>
<tr>
<td><strong>Examples</strong></td>
<td>Audit, Tax &amp; Accounting deptt in accountancy firms.</td>
<td>Wholesale &amp; retail division in a paint company.</td>
<td>UK &amp; European division of multinational company.</td>
<td>Regional sales areas within the retail division of manufacturing company.</td>
</tr>
</tbody>
</table>

## Bases of FOH Apportionment

The following tables indicates the various bases of apportionment for the usual items of factory overhead

<table>
<thead>
<tr>
<th>Item of factory Overhead</th>
<th>Basis of apportionment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent</td>
<td>Area or volume of building</td>
</tr>
<tr>
<td>Depreciation of Machinery</td>
<td>% of original cost of machinery or machine hour rate</td>
</tr>
<tr>
<td>Power</td>
<td>Horse power multiplied by machine hours or KWH or value of machine.</td>
</tr>
<tr>
<td>Electric lighting</td>
<td>Number of light points or area</td>
</tr>
<tr>
<td>Canteen expenses</td>
<td>Number of employees</td>
</tr>
<tr>
<td>Store-keeping and materials handling</td>
<td>Number of stores requisition or material consumed</td>
</tr>
<tr>
<td>Indirect wages of maintenance</td>
<td>Estimated of actual time spent. or direct wages</td>
</tr>
<tr>
<td>department</td>
<td>Measure</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Delivery expenses</td>
<td>Weight, volume or ton-kilometre</td>
</tr>
<tr>
<td>Repairs of plant</td>
<td>Value of plant</td>
</tr>
<tr>
<td>Supervision</td>
<td>no. of machine/employee or Direct wages</td>
</tr>
<tr>
<td>Fire Insurance</td>
<td>Value of Asset or area occupied</td>
</tr>
<tr>
<td>Machine shop exp</td>
<td>Machine hours or Labours hours</td>
</tr>
<tr>
<td>General Exp</td>
<td>Direct Wages or No. of Employees</td>
</tr>
<tr>
<td>Audit Fees</td>
<td>Sales or total cost</td>
</tr>
<tr>
<td>Maintenance of building</td>
<td>Area or labour hours</td>
</tr>
<tr>
<td>Repair and Maintenance Cost</td>
<td>Value of assets or hours worked for each department</td>
</tr>
<tr>
<td>Stores Department</td>
<td>No. of stores requisitions</td>
</tr>
<tr>
<td>Canteen Exp</td>
<td>No. of meal served or no. of employees.</td>
</tr>
<tr>
<td>Transport Dept</td>
<td>Weight or volume or ton-km</td>
</tr>
<tr>
<td>Civil Service Dept</td>
<td>Area.</td>
</tr>
<tr>
<td>Purchase Department</td>
<td>No. of purchase orders placed or value of materials purchased for each department</td>
</tr>
<tr>
<td>Crane service</td>
<td>Crane hours or weight of materials handled</td>
</tr>
<tr>
<td>Time-keeping</td>
<td>No. of employees</td>
</tr>
<tr>
<td>Power house</td>
<td>Heat area of cubic contents or KWH</td>
</tr>
<tr>
<td>Tool Room</td>
<td>Direct Labour hours</td>
</tr>
<tr>
<td>Inspection</td>
<td>Number of units</td>
</tr>
<tr>
<td>Hospital and Dispensary</td>
<td>Number of units</td>
</tr>
</tbody>
</table>
# Break Even Analysis

## Formulae

### Breakeven point

\[
\text{C/M Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100
\]

\[\text{OR}\]

\[
1 - \frac{\text{Variable cost}}{\text{Sales}}
\]

\[\text{OR}\]

\[
\frac{\text{Fixed Cost}}{\text{Contribution per unit (S.P. Per Unit – V.C. Per Unit)}\text{ IN VALUES}}
\]

### In opening stock

\[
\text{Units from opening stock} + (\text{total fixed cost} - \text{total contribution from opening stock/Current Contribution per unit})
\]

### Contribution margin

\[
\text{Sale} - \text{Variable Expense}
\]

### Profit computation

\[
(\text{Sale} \times \text{C/M Ratio}) - \text{Fixed Cost}
\]

### New fixed cost

\[
\text{Sale} - (\text{C/M} - (\text{Margin of safety} \times \text{C/M}))
\]

### Old fixed cost

\[
(\text{Sale} - (100 - \text{Margin of safety}) \times \text{C/M Ratio})
\]

### Variable expenses

\[
(1 - \text{C/M Ratio}) \times \text{Sales}
\]

### Contribution margin ratio

\[
\frac{\text{Contribution}}{\text{Sales}} \times 100
\]

\[\text{OR}\]

\[
\frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100
\]

\[\text{OR}\]

\[
\frac{\text{Change in Contribution}}{\text{Change in Sale}} \times 100
\]

\[\text{OR}\]

\[
\frac{\text{Change in Total Cost}}{\text{Change in Sale}} \times 100
\]

\[\text{OR}\]

\[
\frac{\text{Sale} - \text{Variable Expense}}{\text{Sales}} \times 100
\]

### Decision Clue

\[
\text{Higher the C/M ratio} \rightarrow \text{more will be the profit.}
\]

\[
\text{Lower the C/M ratio} \rightarrow \text{lower will be the profit.}
\]

### Sale projection

\[
\text{Fixed Cost} + \text{Profit (Loss) Projection}
\]

\[
\text{C/M Ratio (Contribution Margin Ratio)}
\]
<table>
<thead>
<tr>
<th>Extra units sold to maintain same profit</th>
<th>Revised Units – Existing Units</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Increase in selling price</th>
<th>Revised Units – Existing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>When marginal cost is Rs: X1X, the selling price is Rs: X2X. When marginal cost is Rs: X3X, the selling price is Rs: X2X * X3X / X1X. Increase in selling price = New Price – Old Price</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No of unit sold to get desired level of profit</th>
<th>Revised Units – Existing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IN UNITS:</strong> Total Required Contribution (Fixed cost + Target profit) Contribution per unit (Sale per unit – Variable cost per unit)</td>
<td>Revised Units – Existing Units</td>
</tr>
<tr>
<td><strong>IN VALUES:</strong> Total Required Contribution (Fixed cost + Target profit) C/M Ratio (Contribution Margin Ratio) • C/M Ratio = Contribution / Sales * 100</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tax impact</th>
<th>Revised Units – Existing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Change in volume in units) * (contribution margin per unit) * (1 – tax rate)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Net decline in contribution margin</th>
<th>Revised Units – Existing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decline in Revenue (unit produce * old sale price – new sale price) XXX Decline in Cost (Further Processing Cost) XXX XXX</td>
<td></td>
</tr>
<tr>
<td>Note: No offer acceptance if net decline in contribution margin &amp; vice versa.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Margin Safety Ratio</th>
<th>Revised Units – Existing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selected sale figure – break even point * 100</td>
<td>Revised Units – Existing Units</td>
</tr>
<tr>
<td>Selected sale figure</td>
<td>Revised Units – Existing Units</td>
</tr>
<tr>
<td><strong>OR</strong></td>
<td>Revised Units – Existing Units</td>
</tr>
<tr>
<td>Profit / C/M Ratio * 100</td>
<td>Revised Units – Existing Units</td>
</tr>
<tr>
<td><strong>IN UNITS</strong> = Actual/Budgeted unit sold – break even unit</td>
<td>Revised Units – Existing Units</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Layman Rule</th>
<th>Revised Units – Existing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost = Total Revenue</td>
<td>Revised Units – Existing Units</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accountant Rule</th>
<th>Revised Units – Existing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribution Margin = FC+ Profit</td>
<td>Revised Units – Existing Units</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cash BEP</th>
<th>Revised Units – Existing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash Fixed Cost</td>
<td></td>
</tr>
<tr>
<td>Cash C/M Per Unit</td>
<td></td>
</tr>
<tr>
<td>• Cash FC means all FC excluding Depreciation+ Amortization + all non cash items.</td>
<td></td>
</tr>
<tr>
<td>• It determines at point where total cash cost &amp; total sales line intersect each other.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Revised P/V ratio</th>
<th>Revised Units – Existing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revised contribution margin per unit</td>
<td>Revised Units – Existing Units</td>
</tr>
<tr>
<td>Revised sale price per unit</td>
<td>Revised Units – Existing Units</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>New Contribution</th>
<th>Revised Units – Existing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule</td>
<td>Revised Units – Existing Units</td>
</tr>
<tr>
<td>No variable expense, all sale price will be C/M</td>
<td>Revised Units – Existing Units</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Profit</th>
<th>Revised Units – Existing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>margin of safety % * C/M %</td>
<td>Revised Units – Existing Units</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Margin of safety</th>
<th>Revised Units – Existing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>total sales – break even sales</td>
<td>Revised Units – Existing Units</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Margin of safety %</th>
<th>Revised Units – Existing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>total sales – break even sales / total sales</td>
<td>Revised Units – Existing Units</td>
</tr>
<tr>
<td><strong>Total sales</strong></td>
<td>Margin of safety profit</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td><strong>Profit</strong></td>
<td>Sales * margin of safety % * C/M %</td>
</tr>
<tr>
<td><strong>Required Contribution</strong></td>
<td>Fixed Cost + Target Profit – Target Loss – Donation – Shut down</td>
</tr>
<tr>
<td><strong>Margin of Safety</strong></td>
<td>Profit</td>
</tr>
<tr>
<td></td>
<td>C/M %</td>
</tr>
<tr>
<td></td>
<td>OR</td>
</tr>
<tr>
<td></td>
<td>Profit</td>
</tr>
<tr>
<td></td>
<td>C/M Per Unit</td>
</tr>
<tr>
<td><strong>Sale Price</strong></td>
<td>Fixed Cost/Unit + Variable Cost Per Unit</td>
</tr>
<tr>
<td><strong>At Break Even Level</strong></td>
<td>Sale – VC – FC = Profit</td>
</tr>
<tr>
<td></td>
<td>OR</td>
</tr>
<tr>
<td></td>
<td>Sale = VC + FC + Profit</td>
</tr>
<tr>
<td><strong>Target Profit</strong></td>
<td>Sale = VC + FC + Profit</td>
</tr>
<tr>
<td><strong>Cost Break even point</strong></td>
<td>It is the production level at which production cost is same irrespective of the alternative adopted.</td>
</tr>
<tr>
<td></td>
<td>Cost B.E.P. = Difference in fixed costs</td>
</tr>
<tr>
<td></td>
<td>Difference in variable costs</td>
</tr>
<tr>
<td><strong>Tax Impact</strong></td>
<td>Before (Divide) = After Tax Income/1-t</td>
</tr>
<tr>
<td></td>
<td>After (Multiply) = Before Tax * (1-t)</td>
</tr>
<tr>
<td><strong>Profitability</strong></td>
<td>Contribution / key factor</td>
</tr>
<tr>
<td><strong>Contribution / key factor</strong></td>
<td>Annual production / Install capacity</td>
</tr>
<tr>
<td>(Break even sale + M/S ratio) * C/M ratio = Contribution</td>
<td></td>
</tr>
<tr>
<td>(Break even sale + C/M ratio) * (M/S ratio * C/M ratio) = FC + Profit</td>
<td></td>
</tr>
<tr>
<td>BEP Sales ( % ) + MOS Sales ( % ) = 100 %</td>
<td></td>
</tr>
<tr>
<td>Contribution at BEP = Fixed cost</td>
<td></td>
</tr>
<tr>
<td>Contribution at MOS = Profit</td>
<td></td>
</tr>
<tr>
<td>Contribution on BEP + Contribution on MOS = Total Contribution</td>
<td></td>
</tr>
<tr>
<td><strong>Fixed Cost</strong></td>
<td>BEP Sales * PV Ratio</td>
</tr>
<tr>
<td><strong>Profit</strong></td>
<td>MOS sales * PV Ratio</td>
</tr>
<tr>
<td>Variable cost = per unit cost is constant but change in total amount.</td>
<td></td>
</tr>
<tr>
<td>Fixed cost = Change in per unit cost but total cost are constant.</td>
<td></td>
</tr>
<tr>
<td>Semi variable Cost = It is Combination of Variable cost and fixed cost.</td>
<td></td>
</tr>
<tr>
<td>If sales price constant than variable cost change in same ratio to sales changes.</td>
<td></td>
</tr>
<tr>
<td>If sales price is change but sales Qty is same than Variable cost also constant but only change in P/V Ratio.</td>
<td></td>
</tr>
<tr>
<td>Question say find out increase in sales price to req. BEP at ….% Than % increase in Sales price = (Current BEP – Revised BEP) / Revised BEP</td>
<td></td>
</tr>
</tbody>
</table>
1. It is the level of activity where total cost equals sale price.
2. It is the point where contribution is equal to fixed cost.
3. It is a point of no profit & no loss.
4. It is the point available to cover fixed expenses & then to provide profits for the period.
5. It is the logical extension of Marginal Costing.
6. It is a powerful instrument for decision making.
7. Contribution means contribution towards fixed cost & profit.
8. Break even point = Zero profit point

ASSUMPTIONS

1. All costs can be separated in fixed & variable costs.
2. No change in operating efficiency.
3. Number of units produced & sold will be the same so that there is no opening & closing stock.
4. All fixed costs will fluctuate & will not change with change of activity level.
5. Only product or in case of many products, product mix will remain unchanged.
6. Selling price will remain constant despite competition or change of volume.
7. Variable cost will fluctuate in same proportion in which volume of output varies.

MARGIN SAFETY RATIO

Sale or output behind break even point is called margin of safety. Margin of safety is that sales or output which is above break even point. All fixed costs are recovered at break even point, so fixed expenses have been excluded from the formula of margin of safety. The margin of safety at break even point is nil as actual unit sold is equal to break even unit sold. It can be increased by:

1. Increase in level of production.
2. Increase in sale price.
3. Reduce fixed cost or variable cost or both.
4. Substitute existing products by more profitable products.

<table>
<thead>
<tr>
<th>Large Margin of Safety</th>
<th>Indicator of strength as substantial reduce in sales &amp; production, profit will be made.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Margin of Safety</td>
<td>Indicator of weakness as small reduce in sales &amp; production, loss will be made.</td>
</tr>
</tbody>
</table>

**ANGLE OF INCIDENCE**

It is an angle at break even point where sales line cuts total cost line. It shows the rate at which the profit is made.

<table>
<thead>
<tr>
<th>Large Angle of Incidence</th>
<th>Profit at high rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Angle of Incidence</td>
<td>Profit at low rate</td>
</tr>
</tbody>
</table>

**REQUIRED SALE TO EARN TARGET PROFIT**

<table>
<thead>
<tr>
<th>In Rupees</th>
<th>In %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed cost + target profit / CM %</td>
<td>Fixed cost / CM % - Target Profit %</td>
</tr>
</tbody>
</table>

**AFTER TAX CALCULATIONS**

<table>
<thead>
<tr>
<th>In Rupees</th>
<th>In %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed cost + Net Profit / (1-t) / CM %</td>
<td>Fixed cost + / CM % - Net Profit / (1-t)</td>
</tr>
</tbody>
</table>

**PRODUCT MIX**

<table>
<thead>
<tr>
<th>In %</th>
<th>Per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed cost + Target Profit / CM %</td>
<td>Fixed cost + Target profit / CM per unit</td>
</tr>
</tbody>
</table>

- $C/M \% = \frac{\text{total contribution}}{\text{total sales}} \times 100$
- $C/M \text{ per unit} = \frac{\text{total contribution}}{\text{total sales}}$

**Note:** In product mix, there is only one fixed cost. That FC is common for all the products.
REQUIRED SALES

<table>
<thead>
<tr>
<th>Required Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Cost + Target Profit</td>
</tr>
<tr>
<td>Less - X &amp; Y Contribution (Demand*Contribution Per Unit)</td>
</tr>
<tr>
<td>Z’s Contribution</td>
</tr>
<tr>
<td>Divided By</td>
</tr>
<tr>
<td>Per Unit contribution of Z’s</td>
</tr>
<tr>
<td>Required sales</td>
</tr>
</tbody>
</table>

ACCOUNTANT VS ECONOMIST

<table>
<thead>
<tr>
<th>ACCOUNTANT</th>
<th>ECONOMIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>One BEP</td>
<td>Two BEP</td>
</tr>
<tr>
<td>Total Cost is straight line</td>
<td>Total Cost is not a straight line (first reduce &amp; then climb as per law of diminishing return)</td>
</tr>
<tr>
<td>Revenue Line is straight line</td>
<td>Revenue Line is not straight line (less steep to depict the need to give discount to achieve higher sale volume)</td>
</tr>
<tr>
<td>Fixed Cost is straight line</td>
<td>-</td>
</tr>
<tr>
<td>Ignore economies / diseconomies of scale, elasticity of demand; discount to secure increase in volume.</td>
<td>Recognize economies / diseconomies of scale.</td>
</tr>
<tr>
<td>Break even time = sale = FC + VC</td>
<td>Break even time = Average revenue = Average cost</td>
</tr>
<tr>
<td>Use is limited to area within relevant range.</td>
<td>-</td>
</tr>
<tr>
<td>Difficult to make chart when step FC occurs.</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>To increase sale, price reductions have to be offered &amp; as output increase, marginal cost of additional production increases.</td>
</tr>
<tr>
<td>-</td>
<td>Economist argues that accountant distinction between FC &amp; VC is unrealistic. In reality, whether cost is fixed or variable depends on time frame taken.</td>
</tr>
<tr>
<td>-</td>
<td>Break even point is intersection of line representing two functions</td>
</tr>
</tbody>
</table>
**BREAKEVEN CHART STEPS**

**Step: 1**  *Select appropriate scales for the axes and draw and label them.* Put the extremes of the axes right at the end of the available space. The furthest point on the vertical axis will be the monthly sales revenue, that is, 1,700 units * Rs: 50 = Rs: 85,000.

The furthest point on the horizontal axis will be monthly sales volume of 1,700 units.

Make sure that you do not need to read data for volumes higher than 1,700 units before you set these extremes for your scales.

**Step: 2**  *Draw the fixed cost line and label it.* This will be a straight line parallel to the horizontal axis at the Rs: 20,000 levels. The Rs: 20,000 fixed costs are incurred in the short term even with zero activity.

**Step: 3**  *Draw the total cost line and label it.* The best way to do this is to calculate the total costs for the maximum sales level, which is 1,700 units in our example. Mark this point on the graph and join it to the cost incurred at zero activity, that is, Rs: 20,000.

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable costs for 1,700 units</td>
<td>51,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>20,000</td>
</tr>
<tr>
<td>Total cost for 1,700 units</td>
<td><strong>71,000</strong></td>
</tr>
</tbody>
</table>

**Step: 4**  *Draw the revenue line and label it.* Once again the best way is to plot the extreme points. The revenue at maximum activity in our example is 1,700 * Rs: 50 = Rs: 85,000. This point can be joined to the origin, since at zero activity there will be no sales revenue.

**Step: 5**  *Mark any required information on the chart and read off solutions as required.*

Check that your chart is accurate by reading off the measures that we have already calculated the breakeven point, the margin of safety, the profit for sales of 1,700 units.

**Step: 6**  *Check the accuracy of your readings using arithmetic.* It is always good examination practice to check the accuracy of your answers and make adjustments for any errors in your chart (if you have time!)
A **contribution breakeven chart** depicts variable costs, so that contribution can be read directly from the chart. The main problem with the traditional breakeven chart is that it is not possible to read contribution directly from the chart.

The contribution breakeven chart remedies this by **drawing the variable cost line instead of the fixed cost line**. A contribution breakeven chart would include the variable cost line passing through the origin and the total variable cost of Rs: XXX for XXX units.

![Contribution Breakeven Chart](image1)

**Figure 3.1** Basic breakeven chart

**Figure 3.2** Contribution breakeven chart
The profit/volume (P/V) graph is a variation of the breakeven chart and illustrates the relationship of profit to sales volume.

**CONSTRUCTION OF A PROFIT/VOLUME GRAPH**

(a) 'P' is on the y axis and actually comprises not only 'profit' but contribution to profit (in monetary value), extending above and below the x axis with a zero point at the intersection of the two axes, and the negative section below the x axis representing fixed costs. This means that at zero production, the firm is incurring a loss equal to the fixed costs.

(b) 'V' is on the x axis and comprises either volume of sales or value of sales (revenue).

(c) The profit-volume line is a straight line drawn with its starting point (at zero production) at the intercept on the y axis representing the level of fixed costs, and with a gradient of contribution/unit (or the C/S ratio if sales value is used rather than units). The P/V line will cut the x axis at the breakeven point of sales volume. Any point on the P/V line above the x axis represents the profit to the firm (as measured on the vertical axis) for that particular level of sales.

Let us draw a P/V graph for our example. At sales of 120,000 units, total contribution will be 120,000 × Rs: (1 – 0.5) = Rs: 60,000 and total profit will be Rs: 20,000.
ADVANTAGES OF THE P/V GRAPH

(a) If the budgeted selling price of the product in our example is increased to Rs: 1.20, with the result that demand drops to 105,000 units despite additional fixed costs of Rs: 10,000 being spent on advertising, we could add a line representing this situation to our P/V chart.

(b) At sales of 105,000 units, contribution will be 105,000 × Rs: (1.20 – 0.50) = Rs: 73,500 and total profit will be Rs: 23,500 (fixed costs being Rs: 50,000).

(c) The diagram shows that if the selling price is increased, the breakeven point occurs at a lower level of sales revenue (71,429 units instead of 80,000 units), although this is not a particularly large decrease when viewed in the context of the projected sales volume. It is also possible to see that for sales above 50,000 units, the profit achieved will be higher (and the loss achieved lower) if the price is Rs: 1.20. For sales volumes below 50,000 units the first option will yield lower losses.

(d) The P/V graph is the clearest way of presenting such information; two conventional breakeven charts on one set of axes would be very confusing.

(e) Changes in the variable cost per unit or in fixed costs at certain activity levels can also be incorporated easily into a P/V graph. The profit or loss at each point where the cost structure changes should be calculated and plotted on the graph so that the profit/volume line becomes a series of straight lines.

(f) For example, suppose that in our example, at sales levels in excess of 120,000 units the variable cost per unit increases to Rs: 0.60 (perhaps because of overtime premiums that are incurred when production exceeds a certain level). At sales of 130,000 units, contribution would therefore be 130,000 × Rs: (1 - 0.60) = Rs: 52,000 and total profit would be Rs: 12,000.

EXAMPLE
A company manufactures a single product which incurs fixed costs of Rs: 30,000 per annum. Annual sales are budgeted to be 70,000 units at a sales price of Rs: 30 per unit. Variable costs are Rs: 28.50 per unit.

(a) Draw a profit–volume chart, and use it to determine the breakeven point. The company is now considering improving the quality of the product and increasing the selling price to Rs: 35 per unit. Sales volume will be unaffected, but fixed costs will increase to Rs: 45,000 per annum and variable costs to Rs: 33 per unit.

(b) Draw, on the same graph as for part (a), a second profit–volume chart and comment on the results.
SOLUTION
The two lines have been drawn as follows:

Situation (a). The profit for sales of 70,000 units is Rs: 75,000.

<table>
<thead>
<tr>
<th>Contribution</th>
<th>Rs: 000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed costs</td>
<td>(30)</td>
</tr>
<tr>
<td>Profit</td>
<td>75</td>
</tr>
</tbody>
</table>

This point is joined to the loss at zero activity, Rs: 30,000, that is, the fixed costs.

Situation (b). The profit for sales of 70,000 units is Rs: 95,000.

<table>
<thead>
<tr>
<th>Contribution</th>
<th>Rs: 000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed costs</td>
<td>(45)</td>
</tr>
<tr>
<td>Profit</td>
<td>95</td>
</tr>
</tbody>
</table>

This point is joined to the loss at zero activity, Rs: 45,000, that is, the fixed costs.

Comment on the results

The chart depicts clearly the larger profits available from option (b). It also shows that the breakeven point increases from 20,000 units to 22,500 units but that this is not a large increase when viewed in the context of the projected sales volume. It is also possible to see that for sales volumes above 30,000 units the profit achieved will be higher with option (b). For sales volumes below 30,000 units option (a) will yield higher profits (or lower losses).

The profit–volume chart is the clearest way of presenting information like this. If we attempted to draw two conventional breakeven charts on one set of axes the result would be a jumble that would be very difficult to interpret.
**ABSORPTION/MARGINAL COSTING**

<table>
<thead>
<tr>
<th>Marginal costing</th>
<th>Direct Material + Direct Labor + Variable FOH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absorption costing</td>
<td>Direct Material + Direct Labor + Total FOH</td>
</tr>
</tbody>
</table>

**Fixed FOH (under absorption)**

<table>
<thead>
<tr>
<th>Fixed FOH</th>
<th>Normal Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual capacity/Production</td>
<td></td>
</tr>
<tr>
<td>Normal Capacity</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** If actual capacity is missing, it is assume that normal capacity is actual capacity.

<table>
<thead>
<tr>
<th>Finished goods inventory</th>
<th>Total COGM * (purchase unit + Opening stock – sale unit) / Actual capacity/production</th>
</tr>
</thead>
</table>

**Marginal cost**

The marginal cost of an item is its variable cost.

- Marginal production cost = Direct materials + Direct labour + Variable production overhead.
- Marginal cost of sale for a product = Direct materials + Direct labour + Variable production overhead + Other variable overhead (for example, variable selling and distribution overhead).
- Marginal cost of sale for a service = Direct materials + Direct labour + Variable overhead.

It is usually assumed that direct labour costs are variable (marginal) costs, but in some situations, direct labour costs might be fixed costs, and so would not be included in marginal cost.

**ALTERNATIVE CONCEPTS OF MARGINAL COSTING**

To **economist**, marginal cost is the additional cost incurred by the production of one extra unit. To **accountant**, marginal cost is average variable cost which is conventionally presumed to act in linear fashion i.e. marginal cost per unit is assumed to be constant on the short run.

**ASSUMPTIONS IN MARGINAL COSTING**

1. Every additional unit of output or sale, or every additional unit of activity, has the same variable cost as every other unit. In other words, the variable cost per unit is a constant value.
2. Fixed costs are costs that remain the same in total in each period, regardless of how many units are produced and sold.
3. Costs are either fixed or variable, or a mixture of fixed and variable costs. Mixed costs can be separated into a variable cost per unit and a fixed cost per period. Techniques such as high/low analysis or linear regression analysis should be used to do this.
4. The marginal cost of an item is therefore the extra cost that would be incurred by making and selling one extra unit of the item.
MARGINAL COSTING DIAGRAM:

Total Cost

Manufacturing Cost

DM  DL  OH

Treated as product cost i.e., considered for stock valuation.

Non-Manufacturing Cost

Treated as period cost & charged to costing P&L A/c.

ABSORPTION COSTING DIAGRAM:

Total Cost

Manufacturing Cost

Treated as Product Cost.

Non-Manufacturing Costs

Treated as period & charged to costing P&L A/c.
## Cost Accounting Manual 2013

### Absorption/Full/Traditional/Conventional Costing

<table>
<thead>
<tr>
<th></th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sale</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Less - Cost of Goods Sold:</strong></td>
<td></td>
</tr>
<tr>
<td>Direct Material</td>
<td>XXX</td>
</tr>
<tr>
<td>Direct Labor</td>
<td>XXX</td>
</tr>
<tr>
<td>Factory Overhead Applied (Fixed + Variable)</td>
<td>XXX</td>
</tr>
<tr>
<td>Cost of Good Manufactured</td>
<td>XXX</td>
</tr>
<tr>
<td>Add – Opening Finished Goods</td>
<td>XXX</td>
</tr>
<tr>
<td><strong>Less – Closing Finished Goods</strong></td>
<td>(XXX)</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td>XXX</td>
</tr>
<tr>
<td>Add – Under Applied</td>
<td>XXX</td>
</tr>
<tr>
<td>Less – Over Applied</td>
<td>(XXX)</td>
</tr>
<tr>
<td>Cost of Goods Sold (Adjusted)</td>
<td>(XXX)</td>
</tr>
<tr>
<td><strong>Gross Profit</strong></td>
<td>XXX</td>
</tr>
<tr>
<td><strong>Less – Operating Expenses:</strong></td>
<td></td>
</tr>
<tr>
<td>Selling overhead (Fixed + Variable)</td>
<td>XXX</td>
</tr>
<tr>
<td>Administration overhead (Fixed + Variable)</td>
<td>XXX</td>
</tr>
<tr>
<td><strong>Operating Profit/ Net Profit</strong></td>
<td>XXX</td>
</tr>
</tbody>
</table>

### Notes:

1. To calculate fixed FOH, see formula above.
2. Capacity will be of two types: 1: Budgeted 2: Normal. Use budgeted capacity. If not given, then use Normal capacity.
3. Opening Finished Goods = Cost of Good Manufactured/Production Units * Opening Stock Units
4. Closing Finished Goods = Cost of Good Manufactured/Production Units * Closing Stock Units
5. Opening Stock Units will be given in the question.
6. Closing Stock Units will be calculated as follows: Opening Stock Units + Purchases – Sales
7. Gross Profit = Sales – COGS
8. Under / Over applied as calculated as per FOH method. Both Fixed & Variable Variances will be considered here.
# Marginal/Direct/Variable Costing

<table>
<thead>
<tr>
<th>Sale</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less- <strong>Cost of Goods Sold:</strong></td>
<td></td>
</tr>
<tr>
<td>Direct Material</td>
<td>XXX</td>
</tr>
<tr>
<td>Direct Labor</td>
<td>XXX</td>
</tr>
<tr>
<td>Factory Overhead Applied (Variable only)</td>
<td>XXX</td>
</tr>
<tr>
<td>Variable Cost of Good Manufactured</td>
<td>XXX</td>
</tr>
<tr>
<td>Add – Opening Finished Goods</td>
<td>XXX</td>
</tr>
<tr>
<td>Less – Closing Finished Goods</td>
<td>(XXX)</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td>XXX</td>
</tr>
<tr>
<td>Add – Under Applied</td>
<td>XXX</td>
</tr>
<tr>
<td>Less – Over Applied</td>
<td>(XXX)</td>
</tr>
<tr>
<td>Cost of Goods Sold (Adjusted)</td>
<td>(XXX)</td>
</tr>
<tr>
<td>Gross Contribution</td>
<td>XXX</td>
</tr>
<tr>
<td>Less – Variable selling &amp; administration overhead</td>
<td>(XXX)</td>
</tr>
<tr>
<td>Net Contribution</td>
<td>XXX</td>
</tr>
<tr>
<td>Less – Operating Expenses:</td>
<td></td>
</tr>
<tr>
<td>Selling overhead (Fixed)</td>
<td>XXX</td>
</tr>
<tr>
<td>Factory overhead (Fixed)</td>
<td>XXX</td>
</tr>
<tr>
<td>Administration overhead (Fixed)</td>
<td>XXX</td>
</tr>
<tr>
<td>Operating Profit/ Net Profit</td>
<td>XXX</td>
</tr>
</tbody>
</table>

**Notes:**

1. Opening Finished Goods = Variable Cost of Good Manufactured/Production Units * Opening Stock Units
2. Closing Finished Goods = Variable Cost of Good Manufactured/Production Units * Closing Stock Units
3. Opening Stock Units will be given in the question.
4. Closing Stock Units will be calculated as follows: Opening Stock Units + Purchases – Sales
5. Under / Over applied as calculated as per FOH method. Only Variable Variances will be considered here.

## Reconciliation

<table>
<thead>
<tr>
<th>Net income (Absorption costing)</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less- Difference in closing stock</td>
<td>XXX</td>
</tr>
<tr>
<td>Add- Difference in opening stock</td>
<td>XXX</td>
</tr>
<tr>
<td><strong>Net income (Marginal costing)</strong></td>
<td>XXX</td>
</tr>
</tbody>
</table>

Difference in profit under two costing system is due to different stock valuation methods use.
## Concepts

| AC = MC | Same Profit |
| AC > MC | High Profit |
| AC < MC | Low Profit |

| Total Contribution > FC | Profit |
| Total Contribution = FC | No Profit & no loss |
| Total Contribution > FC | Loss |

| Production > Capacity | Over applied |
| Production < Capacity | Under applied |

## Marginal Costing vs Absorption Costing

<table>
<thead>
<tr>
<th>Absorption Costing</th>
<th>Marginal Costing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Marginal cost is the part of the cost of one unit of product or service which would be avoided if that unit was not produced or which would increase if one extra unit were produced.</td>
<td>• Marginal cost is the variable cost of one unit of product or service.</td>
</tr>
<tr>
<td>• Marginal cost is the variable cost of one unit of product or service.</td>
<td>• If volume of sales falls by one unit, profit will fall by amount of contribution earned from that unit.</td>
</tr>
<tr>
<td>Fixed production cost are absorbed into the cost of units &amp; carried forward.</td>
<td>Fixed production cost are treated as period cost &amp; written off as incurred.</td>
</tr>
<tr>
<td>Absorption costing will report high profit when stock level increases as fixed overhead will be carried forward to closing stock.</td>
<td></td>
</tr>
<tr>
<td>Closing stocks are valued at full production cost.</td>
<td>Closing stocks are valued at marginal/variable production cost.</td>
</tr>
<tr>
<td>Absorption costing will report low profit when stock level decreases.</td>
<td></td>
</tr>
<tr>
<td>When unit of product is made, the extra cost incurred in its manufacture is variable production costs. Fixed costs are unaffected &amp; no extra fixed costs are incurred when output is increased.</td>
<td></td>
</tr>
</tbody>
</table>

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### Difference Between Various Types of Costing

#### Marginal Costing V/S Absorption Costing
- **Marginal cost** excludes fixed costs.
- **Under absorption costing**, even fixed costs are charged to the product/service.

#### Marginal Costing V/S Direct Costing
- Under marginal costing only variable cost (both direct and indirect) is charged to the cost unit.
- Under direct costing, only direct cost (both fixed and variable) is charged to the cost unit.

#### Absorption Costing V/S Direct Costing
- Under absorption costing, all costs (both direct and indirect) are assigned to the cost unit.
- Under direct costing, only direct cost is assigned to the cost unit. In both types of costing, variability of cost is ignored.

#### Differential Costing V/S Marginal Costing

<table>
<thead>
<tr>
<th>Differential costing</th>
<th>Marginal Costing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope</strong></td>
<td></td>
</tr>
<tr>
<td>Wider than marginal costing.</td>
<td>Narrower than differential costing.</td>
</tr>
<tr>
<td><strong>Variability</strong></td>
<td></td>
</tr>
<tr>
<td>Both fixed and variable costs are considered</td>
<td>Only variable costs are considered.</td>
</tr>
<tr>
<td><strong>Definition</strong></td>
<td></td>
</tr>
<tr>
<td>Cannot be precisely defined except in terms of increase or decrease in total costs.</td>
<td>Can be defined as prime cost plus variable overheads.</td>
</tr>
<tr>
<td><strong>Basis of Decision Making</strong></td>
<td></td>
</tr>
<tr>
<td>Comparison of differential cost with incremental / decremental revenue.</td>
<td>Margin of contribution and profit volume.</td>
</tr>
<tr>
<td><strong>Incorporation in Accounting System</strong></td>
<td></td>
</tr>
<tr>
<td>This type of costing does not find a place in the accounting system as it involves future course of action. However, it may be incorporated in the budgets.</td>
<td>Marginal costs may be incorporated in the accounting system.</td>
</tr>
<tr>
<td><strong>Applicability</strong></td>
<td></td>
</tr>
<tr>
<td>Applicable to both, long term as well as short term decision making.</td>
<td>Applicable only to short term decision making.</td>
</tr>
</tbody>
</table>
LABOR

THREE TYPES OF REMUNERATION

1. **Time work:**
   
   Wages = Hours worked * rate of pay per hour
   
   Overtime = Paid at a premium rate.
   
   a. Overtime premium is extra rate per hour which is paid. It is not the whole of the payment for the overtime hours.
   
   b. Basic rate is Rs; 4 per hour and overtime is paid at time and a quarter. Eight hours of overtime is paid as follows:
      1. Basic Pay \((8 \times 4)\) = 32
      2. Overtime \((8 \times 1)\) = 8
   
   c. Shift premium is given when employees work for unsocial hours. It is similar to overtime premium. It is the extra amount paid per hour above the basic hourly rate.

2. **Piece work:**
   
   Wages = Units produced * rate of pay per unit
   
   a. Guaranteed minimum wage rate is given to piece workers.

3. **Bonus/incentive system**
   
   i. High day rate system
   
   ii. Individual bonus scheme
   
   iii. Group bonus scheme
   
   iv. Profit sharing scheme
   
   v. Incentive scheme involving shares
   
   vi. Value added incentive scheme: \((Value\ added = sales - cost\ of\ bought\ in\ material\ &\ services)\).
   
   vii. Hasley constant partial sharing scheme
   
   viii. Taylor differential piece rate plan
   
   ix. GANTT task & bonus plan
   
   x. Emerson efficiency bonus plan
   
   xi. Rowan variable sharing plan
   
   xii. Bedaux point plan
   
   xiii. Berth variable sharing plan
## FORMULAE

<table>
<thead>
<tr>
<th>Hasley constant partial sharing scheme</th>
<th>Wage rate * 50% * time save</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taylor differential piece rate plan</td>
<td>Wage rate * time save / time allowed * time taken</td>
</tr>
<tr>
<td>Unit</td>
<td>Production</td>
</tr>
<tr>
<td>Time</td>
<td>Hour</td>
</tr>
<tr>
<td>Unit Labor Cost</td>
<td>Labor / Units</td>
</tr>
<tr>
<td>Unit Overhead Cost</td>
<td>FOH / Units</td>
</tr>
<tr>
<td>Conversion Cost Per Unit</td>
<td>DL + FOH / Units</td>
</tr>
</tbody>
</table>

### PRODUCTIVITY

| 1 - Output man per hour               | Total Output / Total Man hours |
| 2 - Labor Hour per unit of production| Total Labor Hour / Total Output |
| 3 - Extent of ineffective/Lost time   | Man hours Lost / Possible Man Hours * 100 |
| 4 - Actual Time compared with standard time | Actual Time - Standard Time |

| 5 - Other Methods                    | Sale Value / No of workers |
|                                      | Direct Wages / No of units |
| Premium Costing Methods              | Added value of the product / Total wages cost |
| Effective Per hour                   | Total Weekly Earnings / Total Hours |
| Labor Turnover Methods               | Number of employees leaving / Avg number on payroll |
|                                      | OR Number of employees leaving + joining / Avg number on payroll |
|                                      | OR Number of employees replaced / Avg number on payroll |
| Idle time formula                    | Idle hours / total hours * 100 |
| Halsey-Weir plan                     | Earnings = Hours worked*rate per hour + 30% of time saved*rate per hour |
| Gantt Task and bonus system          | a) Output below standard = Net payment is of guaranteed time rate |
|                                      | b) Output at standard = Net payment is 120% of time rate |
|                                      | c) Output above standard = Net payment is 120% of piece rate |
| Emerson Efficiency Plan              | a) Efficiency below 66-2/3% = No bonus, only guaranteed time rate |
b) From 66-2/3% to 100% = It changes at various levels, at 100% bonus rate is 20% of the Time wages
c) Above 100% = 120% of time wages + 1% increase for every 1% increase in efficiency beyond 100%

<table>
<thead>
<tr>
<th>Bedaux Pont System</th>
<th>Earnings = hours worked * rate per hour + 75% of hours saved * rate per hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taylor’s System</td>
<td>a) Efficiency Less than 100% = Payment is 80% of piece rate</td>
</tr>
<tr>
<td></td>
<td>b) Efficiency of 100% or more = Payment is 120% of piece rate</td>
</tr>
<tr>
<td>Merrick differential piece rate System</td>
<td>a) For efficiency up to 83% = payment is ordinary piece rate</td>
</tr>
<tr>
<td></td>
<td>b) For efficiency from 83% to 100% = payment is 110% of ordinary piece rate</td>
</tr>
<tr>
<td></td>
<td>c) For efficiency more than 100% = Payment is 120% of ordinary piece rate</td>
</tr>
<tr>
<td>Barth System</td>
<td>Earnings = rate per hour * √standard hour * hours worked</td>
</tr>
</tbody>
</table>

**Rowan Variable Sharing Plan**

1. Base wage are generally guaranteed up to task. Above such task, bonuses are paid according to a variable share of the time saved.
2. Time saved is the function of standard time allowed whereas in other bonus plan, it is the function of actual time worked.

<table>
<thead>
<tr>
<th></th>
<th>Worker – 1</th>
<th>Worker – 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard time allowed in hours</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Actual time taken in hours</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>% bonus (Standard time allowed in hours - Actual time taken in hours) / Standard time allowed in hours</td>
<td>8-4/8*100 = 50%</td>
<td>8-6/8*100 = 25%</td>
</tr>
</tbody>
</table>

**Emerson Efficiency Bonus Plan**

1. Empirical scale of bonus ratios
2. 66% efficiency = ZERO bonus
3. 87.5% efficiency = agreed % bonus
Assume normal wage rate | 7.50
---|---
66% efficiency | ZERO
87.5% efficiency | 7.50+10% = 8.25
100% efficiency | 7.50+20% = 9
101% efficiency | 7.50+21% = 9.075

**GANTT TASK & BONUS PLAN**

<table>
<thead>
<tr>
<th>Standard Production</th>
<th>Below Production</th>
<th>Above Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piece Produced</td>
<td>300</td>
<td>291</td>
</tr>
<tr>
<td>Production % to standard</td>
<td>100%</td>
<td>97%</td>
</tr>
</tbody>
</table>

**Wages Calculation**

<table>
<thead>
<tr>
<th>Normal Wage</th>
<th>Normal Wage</th>
<th>Normal Wage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonus</td>
<td>-</td>
<td>Bonus</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>Additional Bonus (wage + bonus * %)</td>
</tr>
</tbody>
</table>

**BEDAUX POINT PLAN**

1. Time saved = 75%
2. Remaining time of 25% to foreman, serviceman, other indirect personnel
3. Normal performance index = 60% (not 100%) on assumption that 60 units of standard time can be produced with normal effort in 60 minutes of actual time. Technically, one point = one minute.
4. For first 60 points, worker will get normal wages. For additional points, say 75 – 60 = 15 points will be distributed in 75:25 ratio.

**PRODUCTION VS PRODUCTIVITY**

<table>
<thead>
<tr>
<th>Production</th>
<th>Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity or volume of output produced.</td>
<td>Measure of efficiency with which output has been produced.</td>
</tr>
<tr>
<td>Relative measure of hours actually taken &amp; the hours that should have been taken to make the output.</td>
<td></td>
</tr>
<tr>
<td>Improved productivity is the mean of reducing total unit costs.</td>
<td></td>
</tr>
</tbody>
</table>
LABOR COST BEHAVIOUR

1. Payment in piecework basis = variable cost
2. Labor cost is often mixed costs due to bonus, overtime premium, and commission.
3. Payment in day rate wage = pay per week is fixed regardless of volume.

DIFFERENCE BETWEEN DIRECT & INDIRECT LABOR

<table>
<thead>
<tr>
<th>Basic pay of direct worker</th>
<th>Direct cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic pay of indirect worker</td>
<td>Indirect cost unless customer asks for order which involve dedicated use of indirect worker time</td>
</tr>
<tr>
<td>Bonus</td>
<td>Indirect cost</td>
</tr>
<tr>
<td>Wage of support staff</td>
<td>Indirect costs</td>
</tr>
<tr>
<td>Idle time</td>
<td>Indirect costs</td>
</tr>
<tr>
<td>Cost of work on capital equipment</td>
<td>Added to cost of equipment</td>
</tr>
<tr>
<td>Employers National insurance contribution</td>
<td>Indirect labor costs</td>
</tr>
</tbody>
</table>
| Overtime premium to direct or indirect workers | Indirect costs. Exceptions are:  
  - Overtime worked at specific request of customer to get his order completed, direct costs  
  - Overtime is worked regularly by production deptt in normal course of operation, overtime premium paid to direct workers will be direct costs. |

ACCOUNTING TREATMENT

<table>
<thead>
<tr>
<th>IDLE TIME</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Idle time</td>
<td>Should be charged to the cost of production</td>
</tr>
<tr>
<td>Abnormal Idle time</td>
<td>Should be charged to Costing Profit and Loss account.</td>
</tr>
</tbody>
</table>
## COST CYCLE

<table>
<thead>
<tr>
<th>GENERAL</th>
<th>HEAD OFFICE</th>
<th>FACTORY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purchase of Material:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voucher/Account Payable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voucher/Account Payable</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Purchase of Material:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory Ledger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory Ledger</td>
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<td></td>
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<tr>
<td>Voucher/Account Payable</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Material Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Return of Material:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voucher/Account Payable</td>
<td></td>
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<td>Factory Ledger</td>
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<td></td>
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<td>Factory Ledger</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Return of Material:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Ledger</td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Material Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Material Issued:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work-in-Process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work-in-Process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory Overhead</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory Overhead</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material Control</td>
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<td>Prepaid Expenses</td>
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<td><strong>Material Issued:</strong></td>
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<td>Material Control</td>
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<td>Material Control</td>
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<td>Work-in-Process</td>
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<td>Work-in-Process</td>
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<td>Factory Overhead</td>
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<td><strong>FOH Payment:</strong></td>
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<td>Various Credits</td>
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<td>Various Credits</td>
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<td>Voucher Payable</td>
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<td><strong>FOH Applied:</strong></td>
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<tr>
<td>Work-in-Process</td>
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<td>Work-in-Process</td>
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<td>FOH Applied</td>
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<td>FOH Applied</td>
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<td><strong>FOH Applied:</strong></td>
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<tr>
<td>Factory Ledger</td>
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<td>Factory Ledger</td>
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<td>FOH Applied</td>
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<td>FOH Applied</td>
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<td><strong>Disposal FOH Applied:</strong></td>
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<td>FOH Applied</td>
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<td>FOH Control</td>
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<td>NO ENTRY WILL BE RECORDED AT FACTORY OFFICE.</td>
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<td><strong>Payroll:</strong></td>
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<td>Payroll</td>
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<tr>
<td>Income tax with held Provident fund</td>
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<td>Income tax with held Provident fund</td>
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<tr>
<td>Accrued Payroll</td>
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<td>Accrued Payroll</td>
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<td>NO ENTRY WILL BE RECORDED AT HEAD OFFICE.</td>
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<td>NO ENTRY WILL BE RECORDED AT FACTORY OFFICE.</td>
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<tr>
<td><strong>Payroll Payment:</strong></td>
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<td>Accrued Payroll</td>
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<td>Accrued Payroll</td>
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<td>Voucher Payable</td>
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<tr>
<td><strong>Payroll Disposal:</strong></td>
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<td>Voucher Payable</td>
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<td>NO ENTRY WILL BE RECORDED AT HEAD OFFICE.</td>
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<tr>
<td>NO ENTRY WILL BE RECORDED AT FACTORY OFFICE.</td>
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</tr>
</tbody>
</table>
Payroll Distribution:
- Work-in-Process
- Factory Overhead
- Selling Overhead
- Distribution Overhead
- Payroll

Payroll Distribution:
- Factory Ledger
- Selling Overhead
- Distribution Overhead
- Payroll
  (Factory ledger will be used for WIP & FOH)

Payroll Distribution:
- Work-in-Process
- Factory Overhead
- General Ledger
  (General ledger will be used for SOH & DOH)

Payroll Contribution:
- Work-in-Process
- Factory Overhead
- Selling Overhead
- Distribution Overhead
- Income tax with held
- Provident fund
- Social Security Fund

Payroll Contribution:
- Factory Ledger
- Selling Overhead
- Distribution Overhead
- Income tax with held
- Provident fund
- Social Security Fund

Payroll Contribution:
- Work-in-Process
- Factory Overhead
- General Ledger

Finished Goods:
- Finished Goods
- Work-in-Process

NO ENTRY WILL BE RECORDED AT HEAD OFFICE.

Finished Goods:
- Finished Goods
- Work-in-Process

NO ENTRY WILL BE RECORDED AT FACTORY OFFICE.

Cost Of Goods Sold:
- Cost Of Goods Sold
- Finished Goods

Cost Of Goods Sold:
- Cost Of Goods Sold
- Factory Ledger

Cost Of Goods Sold:
- General Ledger
- Finished Goods

Credit Sale:
- Trade Debtor
- Sale

NO ENTRY WILL BE RECORDED AT HEAD OFFICE.

Credit Sale:
- Trade Debtor
- Sale

NO ENTRY WILL BE RECORDED AT FACTORY OFFICE.

**Note:** We will always use General Ledger for Head Office & Factory Ledger for Factory while recording journal entries.

**INTEGRATED ACCOUNTING SYSTEM**

In the integrated accounting system, separate set of accounts under cost accounting and financial accounting systems are not maintained. The accounts are integrated and only a single set of accounts are maintained. This enables a firm to eliminate separate Profit and Loss Accounts under financial accounting and cost accounting systems and only one Profit and Loss Account is prepared. Thus there is no question of two separate amounts of profits being disclosed from the two different set of books. The need for reconciliation of profits shown by cost accounts and financial accounts is therefore is eliminated.

**NON-INTEGRATED ACCOUNTING SYSTEM**

Under the non-integrated system, separate ledgers are maintained for financial transactions while the cost accounts department is responsible for maintaining cost accounts.
ACCOUNTS IN THE COST LEDGER

- The costs of materials, labour and expenses
- Overhead costs
- The costs of production
- Sales and the cost of sales
- Profit or loss.
- Under-absorbed or over-absorbed production overhead

THE INVENTORY ACCOUNTS

**Raw materials:** The raw materials inventory account, or stores account, is used to record the cost of materials purchased, and the cost of materials issued from the stores department to other departments. The balance on the raw materials inventory account shows the cost of the raw materials currently held as inventory.

**Work-in-progress (WIP):** WIP account records the costs of direct materials, direct labour and direct expenses (if any), and absorbed production overhead costs. It also records the cost of finished production. (Finished production is either transferred to a finished goods store or sold directly to the customer.) The balance on the WIP inventory account shows the cost of production still in progress and not yet completed. This inventory of unfinished production is called ‘work-in-progress’.

**Finished goods:** It records the production cost of completed units transferred from production into the finished goods store, and the production cost of goods that are then transferred from the store and sold to customers. The balance on the finished goods inventory account shows the production cost of finished output held in store.

RECORDING COSTS INCURRED

- The raw materials account records the cost of materials purchased.
- The wages and salaries cost account records the cost of labour. (Sometimes, you might come across a direct labour cost account, which records the wages and salary costs of direct labour only.)
- Overhead cost accounts record the overhead costs incurred.
- The work-in-progress account records the production costs of items produced.
- It records the cost of direct materials, direct labour and production overheads absorbed. These costs are transferred to work in progress from the raw materials account, wages and salaries cost account and production overheads account.
- The finished goods account records the production cost of completed production that is transferred from work in progress to the store of finished goods inventory.
The cost of sales account records the total cost of sales, which consists of production costs, administration costs and sales and distribution costs. Costs incurred are recorded as debit entries in these accounts.

### COSTS OF PRODUCTION AND THE WIP ACCOUNT

<table>
<thead>
<tr>
<th>Nature:</th>
<th>The WIP account is used to record the costs of production – direct materials, direct labour and production overheads absorbed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debit</td>
<td>Credit</td>
</tr>
<tr>
<td>1) Direct materials issued from stores to production</td>
<td>WIP account</td>
</tr>
<tr>
<td>2) Direct labour costs in production</td>
<td>WIP account</td>
</tr>
<tr>
<td>3) Production overheads absorbed into production costs</td>
<td>WIP account</td>
</tr>
</tbody>
</table>

### FROM RAW MATERIALS TO COST OF SALES

<table>
<thead>
<tr>
<th>Nature:</th>
<th>Materials progress through the production system, from raw materials to work in progress, from work in progress to finished goods, and from finished goods to cost of sales.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debit</td>
<td>Credit</td>
</tr>
<tr>
<td>1) Direct materials issued from stores to production (work in progress)</td>
<td>WIP account</td>
</tr>
<tr>
<td>2) Completed production transferred from WIP to finished goods (at production cost)</td>
<td>Finished goods account</td>
</tr>
<tr>
<td>3) Finished goods sold to customers</td>
<td>Cost of sales account</td>
</tr>
</tbody>
</table>

### NON-PRODUCTION OVERHEADS

<table>
<thead>
<tr>
<th>Nature:</th>
<th>Non-production overheads are recorded initially in an administration overheads account and a sales and distribution overheads account. They are transferred from these accounts to the cost of sales account. The cost of sales account therefore records the production cost of finished goods sold, administration overheads costs and sales and distribution overheads costs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debit</td>
<td>Credit</td>
</tr>
<tr>
<td>1) Administration overheads</td>
<td>Cost of sales account</td>
</tr>
</tbody>
</table>
OPENING AND CLOSING INVENTORY

1. The raw materials account, work-in-progress account (incomplete production) and finished goods account provide a record of the cost of opening and closing inventory at the beginning and end of each accounting period.

2. The value of the inventory is the current balance on the inventory account. This is always either 0 or a debit balance.

3. However, at the end of an accounting period, an account is ‘closed off’ for the period, and the balance on the account is:
   1) carried forward as a closing balance for the period that has just ended, and
   2) an opening balance at the beginning of the new period.

4. The closing inventory at the end of a period is entered on the credit side ‘above the line’ and the corresponding double entry is a debit entry ‘below the line’ as opening inventory at the beginning of the next period.

5. ‘b/f’ means ‘brought forward’. You might also see the letters ‘b/fwd’ or ‘b/d’ (meaning ‘brought down’). Similarly, ‘c/f’ means carried forward. You might also see the letters ‘c/fwd’ or c/d (for ‘carried down’). The opening inventory brought forward is called the ‘balance’ on the account at the beginning of the period.

THE COSTING SYSTEM INCOME STATEMENT

Nature: There is an income statement in the cost ledger, for recording the profit or loss in each accounting period. This is a part of the double entry cost accounting system. The credit side of the income statement records sales. The debit side of the income statement records the cost of sales. There might also be other items in this account, such as under- or over-absorbed overheads (in an absorption costing system) or variances (in a standard costing system) or abnormal loss or abnormal gain (in a process costing system).

The balance on this income statement account is:
   1) A credit balance when sales are higher than the cost of sales, and there is a profit.
   2) A debit balance when sales are less than the cost of sales, and there is a loss.

The profit or loss for the period is then transferred to a retained profits account, so that the balance on the income statement becomes 0.
THE FINANCIAL LEDGER CONTROL ACCOUNT

**Nature:**

The cost ledger includes accounts relating to costs. There are many other accounts that are not specifically related to costs, such as the bank account, the account for trade receivables, the account for trade payables, an account for accumulated profits, and so on. In the cost ledger, a special account called the financial ledger control account (or the cost ledger control account) may be used to record one of the double entry transactions required when the appropriate account does not exist in the cost ledger.

ACCOUNTING FOR DIRECT AND INDIRECT MATERIALS AND LABOUR COSTS

**Nature:**

Direct materials costs and direct labour costs are direct costs of production and are charged to the work-in-progress account. Indirect materials costs and indirect labour costs are overhead costs of production and are charged to the production overhead account, administration overhead account or selling and distribution overheads account, as appropriate.

<table>
<thead>
<tr>
<th>Debit</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials issued from stores to production</td>
<td>WIP account</td>
</tr>
<tr>
<td>Raw materials account (inventory account)</td>
<td></td>
</tr>
<tr>
<td>Direct labour costs in production</td>
<td>WIP account</td>
</tr>
<tr>
<td>Wages and salaries account</td>
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<tr>
<td><strong>Indirect materials</strong></td>
<td></td>
</tr>
<tr>
<td>Indirect materials issued from stores to production cost centres</td>
<td>Production overheads account</td>
</tr>
<tr>
<td>Raw materials account (inventory account)</td>
<td></td>
</tr>
<tr>
<td>Indirect materials issued from stores to administration cost centres</td>
<td>Administration overheads account</td>
</tr>
<tr>
<td>Raw materials account (inventory account)</td>
<td></td>
</tr>
<tr>
<td>Indirect materials issued from stores to sales and distribution cost centres</td>
<td>Sales and distribution overheads account</td>
</tr>
<tr>
<td>Raw materials account (inventory account)</td>
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<tr>
<td><strong>Indirect labour</strong></td>
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<tr>
<td>Indirect labour production Cost</td>
<td>Production overheads account</td>
</tr>
<tr>
<td>Wages and salaries account</td>
<td></td>
</tr>
<tr>
<td>Administration costs of Labour</td>
<td>Administration overheads account</td>
</tr>
<tr>
<td>Wages and salaries account</td>
<td></td>
</tr>
<tr>
<td>Sales and distribution labour costs</td>
<td>Sales and distribution overheads account</td>
</tr>
<tr>
<td>Wages and salaries Account</td>
<td></td>
</tr>
</tbody>
</table>
ABSORBED PRODUCTION OVERHEADS

| Nature: | Production overheads are absorbed into the cost of production. The balance on the production overhead account is the under-absorbed overhead or over-absorbed overhead. At the end of each accounting period, this balance is transferred to an under- or over-absorbed overhead account. |

| Production overheads | WIP account (Absorbed overheads are added to the cost of production) | Production overheads account |

COMPLETING THE COST ACCOUNTING INCOME STATEMENT

| Nature: | The cost ledger includes an income statement where sales are matched with the cost of sales. Other adjustments, such as an adjustment for under- or over-absorbed overheads, are also recorded in the income statement, and the balance on the account is the profit or loss for the period. |

THE FINISHED GOODS ACCOUNT

| Nature: | The finished goods account records the production cost of finished goods completed in the period, and the production cost of goods sold in the period. |

THE COST OF SALES ACCOUNT AND THE SALES ACCOUNT

| Nature: | The cost of sales account records the total cost of sales in the period – the production cost of sales and administration and sales and distribution overheads. |

THE COST ACCOUNTING INCOME STATEMENT

| Nature: | The profit or loss is recorded in a cost accounting income statement. The income statement also includes any other adjustments to profit, such as under or over absorbed overhead, abnormal loss or gain, or standard cost variances. The balance on the income statement is the profit or loss for the period. The matching double entry is in the financial ledger control account (accumulated profits). |

RECONCILIATION OF COST AND FINANCIAL ACCOUNTS

**Reasons for Difference in Profit**

The profit shown by financial accounts and cost accounts differ on account of the following reasons.
I] **Items of Financial Nature not recorded in Cost Accounts:** The following items are not recorded in cost accounts as they are of purely financial nature and consequently the profits differ as these items are recorded in the financial accounts.

- Interest received on bank deposits.
- Dividend, interest received on investments.
- Rent received
- Losses on sale of assets
- Bad debts written off, recovered
- Transfer fees received
- Interest on proprietor’s capital
- Fines and penalties payable
- Compensation payable.

II] **Items Charged to Profit and Loss Account but not Recorded in Cost Accounts:** The following items are found in the cost accounts but not recorded in the financial accounts.

- Corporate taxes
- Appropriations out of profits, such as transfer of profits to reserves
- Certain payments like dividend
- Additional provisions of depreciation
- Certain amounts written off such as goodwill, patents, preliminary expenses, underwriting commission etc.

III] **Items Peculiar in Cost Accounts:** The items described below are peculiar in cost accounts while their treatment in financial accounts is different. Hence there is a difference between the profits shown by both the systems

**Overheads:** In cost accounts, overheads are finally absorbed in the products by computing the predetermined rate of absorption. In such cases, there may be under/over absorption of overheads.

This means that the overheads actually incurred will not tally with the overheads charged to the product. In financial accounts overheads are always taken at actual basis irrespective of under/over absorption of the same. In such cases the profits shown by both the systems will differ. However, if the under/over absorbed overheads are charged to the costing profit and loss account, the profits shown by financial accounts and cost accounts will not differ.

**Valuation of Closing Stock and Work-in-Progress:** The principle of valuation of closing stock in financial statements is cost price or market price whichever is less. However, in cost accounts, valuation of closing stock may be made on the basis of marginal costing where only the variable costs are taken into consideration while valuing the closing stock. Thus the closing stock valuation may differ. Work-in-Progress in cost accounts is often valued on the basis of prime cost and sometimes variable manufacturing overheads are added in the same. On the other hand, in financial accounting, work-in-progress may be valued after taking into
consideration administrative expenses also. Due to this difference in valuation, profits shown by cost accounts and financial accounts differ.

**Abnormal Losses and Gains:** In cost accounts, abnormal losses and gains are computed and transferred to the Costing Profit and Loss A/c. No such computation is made in the financial accounts. This results in difference between the profits shown by cost accounts and financial accounts.

### PROFORMA OF A RECONCILIATION STATEMENT

<table>
<thead>
<tr>
<th>Profit as per cost accounts</th>
<th>XX</th>
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</thead>
<tbody>
<tr>
<td><strong>Add:</strong></td>
<td></td>
</tr>
<tr>
<td>1. Income and profits taken in financial accounts and not in cost accounts.</td>
<td>XX</td>
</tr>
<tr>
<td>2. Notional expenses taken in cost accounts and not in financial accounts.</td>
<td>XX</td>
</tr>
<tr>
<td>3. Over-absorption overheads in cost accounts.</td>
<td>XX</td>
</tr>
<tr>
<td>4. Excess valuation of opening inventory in cost accounts as compared to valuation in financial accounts.</td>
<td>XX</td>
</tr>
<tr>
<td>5. Lower valuation of closing inventory in cost accounts as compared to valuation in financial accounts.</td>
<td>XX</td>
</tr>
<tr>
<td>6. Excess depreciation accounted for in cost accounts.</td>
<td>XX</td>
</tr>
<tr>
<td><strong>Less:</strong></td>
<td></td>
</tr>
<tr>
<td>1. Expenses and losses accounted for in financial accounts and not in cost accounts.</td>
<td>XX</td>
</tr>
<tr>
<td>2. Appropriations in financial accounts only.</td>
<td>XX</td>
</tr>
<tr>
<td>3. Notional income taken in cost accounts and not in financial accounts.</td>
<td>XX</td>
</tr>
<tr>
<td>4. Under-absorption of overheads in cost accounts.</td>
<td>XX</td>
</tr>
<tr>
<td>5. Lower valuation of opening inventory in cost accounts as compared to valuation in financial accounts.</td>
<td>XX</td>
</tr>
<tr>
<td>6. Higher valuation of closing inventory in cost accounts as compared to valuation in financial accounts.</td>
<td>XX</td>
</tr>
<tr>
<td>7. Lower depreciation accounted for in cost accounts.</td>
<td>XX</td>
</tr>
<tr>
<td><strong>Profit or loss as per Financial A/c</strong></td>
<td>XX</td>
</tr>
</tbody>
</table>
# Job Order Costing

## Job Cost Sheet Format

**JOB ORDER COST SHEET**

<table>
<thead>
<tr>
<th>Job #</th>
<th>Customer Name</th>
<th>Date Started</th>
<th>Description</th>
<th>Date Ordered</th>
<th>Date Wanted</th>
<th>Date Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
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</tbody>
</table>

**Direct Material**

<table>
<thead>
<tr>
<th>Date</th>
<th>Department</th>
<th>Description</th>
<th>Unit Cost</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
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</table>

**Total**

|       |             |             |           |       |

**Direct Labor**

<table>
<thead>
<tr>
<th>Date</th>
<th>Department</th>
<th>Description</th>
<th>Hour</th>
<th>Rate</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</table>

**Total**

|       |             |             |           |       |

**Applied Factory Overhead**

<table>
<thead>
<tr>
<th>Date</th>
<th>Department</th>
<th>Basis</th>
<th>Hour</th>
<th>Rate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</table>

**Total**

|       |             |             |           |       |

**Summary**

<table>
<thead>
<tr>
<th></th>
<th>XXX</th>
<th>Selling Price</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material</td>
<td>XXX</td>
<td>Less – Factory Cost</td>
<td>XXX</td>
</tr>
<tr>
<td>Direct Labor</td>
<td>XXX</td>
<td>Admin Exp</td>
<td>XXX: (XXX)</td>
</tr>
<tr>
<td>Applied Factory Overhead</td>
<td>XXX</td>
<td>Profit</td>
<td>XXX</td>
</tr>
<tr>
<td>Total</td>
<td>XXX</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Date Started** | **WIP**
--- | ---
**Date Finished** | **FG**
**Date Sold** | **COGS**
**BID PRICE / MINIMUM SALE PRICE**

<table>
<thead>
<tr>
<th></th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material</td>
<td></td>
</tr>
<tr>
<td>Direct Labor</td>
<td>XXX</td>
</tr>
<tr>
<td>Factory Overhead</td>
<td></td>
</tr>
<tr>
<td>Admin Exp</td>
<td></td>
</tr>
<tr>
<td>Selling Exp</td>
<td></td>
</tr>
<tr>
<td>Other Exp</td>
<td></td>
</tr>
<tr>
<td>Total Cost</td>
<td>XXX</td>
</tr>
<tr>
<td>Allowance for contingency</td>
<td></td>
</tr>
<tr>
<td>Bid Price/ Minimum Sale Price</td>
<td>XXX</td>
</tr>
</tbody>
</table>

**OVERTIME CASES**

**CASE # 01**
- NORMAL
- OVERTIME

**CASE # 02**
- OVERTIME DONE AT CLIENT
- SPECIAL REQUEST FOR EARLY JOB COMPLETION

**CASE # 03**
- OVERTIME DONE AT CLIENT
- SPECIAL REQUEST FOR EARLY COMPLETION OF ANOTHER JOB

<table>
<thead>
<tr>
<th>BASIC</th>
<th>Job Cost</th>
<th>Job Cost</th>
<th>Job Cost</th>
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</thead>
<tbody>
<tr>
<td>OVERTIME PREMIUM</td>
<td>FOH</td>
<td>FOH</td>
<td>Other Job Cost</td>
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</table>

**RECTIFICATION WORK**

<table>
<thead>
<tr>
<th>Normal Activity</th>
<th>Charge to FOH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Normal Activity</td>
<td>Charge to JOB</td>
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</table>
## Q # 1 [spring – 2011]

### A

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>(180000<em>12</em>110)</td>
<td>273600</td>
</tr>
<tr>
<td>Less- Material – A</td>
<td>(2025000*45)</td>
<td>91125</td>
</tr>
<tr>
<td>Material – B</td>
<td>(675000*30)</td>
<td>20250</td>
</tr>
<tr>
<td>Labor</td>
<td>(18000/200 = 90<em>180000</em>12*20/60)</td>
<td>64800</td>
</tr>
<tr>
<td>V/FOH</td>
<td>(180000*12/80% * 15)</td>
<td>40500</td>
</tr>
<tr>
<td>F/FOH</td>
<td></td>
<td>10000</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td></td>
<td>(226675)</td>
</tr>
<tr>
<td><strong>Gross Profit</strong></td>
<td></td>
<td>46925</td>
</tr>
</tbody>
</table>

**Workings:**


### B

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>(180000<em>12</em>110)</td>
<td>273600</td>
</tr>
<tr>
<td>Less- Material – A</td>
<td>(1800000*48)</td>
<td>86400</td>
</tr>
<tr>
<td>Material – B</td>
<td>(600000*30)</td>
<td>18000</td>
</tr>
<tr>
<td>Labor</td>
<td>(See Working)</td>
<td>54108</td>
</tr>
<tr>
<td>V/FOH</td>
<td>(180000*12/90% * 15 – 20%)</td>
<td>28800</td>
</tr>
<tr>
<td>Depreciation</td>
<td>(7.5 Million/5)</td>
<td>1500</td>
</tr>
<tr>
<td>F/FOH</td>
<td>(10000 -15%)</td>
<td>8500</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td></td>
<td>(197308)</td>
</tr>
<tr>
<td><strong>Gross Profit</strong></td>
<td></td>
<td>40292</td>
</tr>
</tbody>
</table>

**Workings:**

Material: 180000*12/90% = 2400000 (Material – A: 1800000 + Material –B: 600000)

Labor:  
- \((18000/200 = 90*180000*12*14/60) = 45360\)  
- \((720000-504000 = 216000*90*45%) = 8748\)  
  \(54108\)
Q # 5 [spring – 2011]

**PART - A**

**Sales Quantity** = Fixed Cost + Target Profit = 61000+65660 /208 = 608.942 units

C/M Per Unit

Target profit:
- Profit of Q: 1 = 62540
- Shortfall of Q: 2 = 3120 (62540-59420)

Total profit = 65660

C/M Per Unit Revi
e Sale Price (860-15) = 845

VC = (637)

C/M = 208

Note = 464400/540000 = 860

<table>
<thead>
<tr>
<th>FOH</th>
<th>Selling</th>
</tr>
</thead>
<tbody>
<tr>
<td>580000</td>
<td>84660</td>
</tr>
<tr>
<td>540000</td>
<td>80580</td>
</tr>
<tr>
<td>40000</td>
<td>4080</td>
</tr>
<tr>
<td>VC (Per Unit)</td>
<td>102</td>
</tr>
<tr>
<td>FC</td>
<td>25500</td>
</tr>
</tbody>
</table>

VC Per Unit:
- Material (183.6/540) = 340
- Labor (91.8/540) = 170
- FOH = 102
- Selling = 25

Total FC
- FOH = 25500
- Selling = 12000
- Admin = 23500

**Total FC** = 61000
PART - B

Minimum Sales Price =

\[
\begin{align*}
&\text{Total Variable Cost (650 * 637)} = 414050 \\
&\text{Total Fixed Cost (61000 + 2500)} = 63500 \\
&\text{Target Profit} = 65600 \\
&\text{Total Sale Value Required} = 543210
\end{align*}
\]

\[
\text{Sale Price will be} = \frac{543210}{650000} = 835.70
\]

Q # 4 [spring – 2011]

Material: 150000 units require 25000 kg * 3 of Mat: C = 75000 kg.

Market Demand = 75000 kg of Mat: C

Capacity: 100000 kg.

Purchase: 50000 (75000-25000) from outside.

Normal Loss: 4%

Production: 25000-1000 (25000*4%) = 24000 kg

Company will buy 51000 kg of Mat: C by outside. Normal Loss is also there. So, company will buy 51000/0.96 = 53125 kg of Mat: C by outside.

\[
\text{VC (25000*200)} = \text{5000000}
\]

Set up Cost = 80000

Purchase cost = 53125 * 225 = 11953125

Total = 5000000+80000+11953125 = 17033125

VC: 250*230625 = 5765625

Labor: Labor rate per hr = 9000/200 = 45

Labor required for this job = 150000/100*150 = 225000 hrs

Normal Loss is there. So more labor hr will be needed.

\[
\begin{align*}
&x-0.04 = 225000 \\
&\Rightarrow x = 225000/0.04 = 234375
\end{align*}
\]
234375 - 225000 = 9375 is Normal loss for total production but inspect 60% of process, the Normal Loss will be = 9375 * 60% = 5625 hr.

Total hr = 225000 + 5625 = 230625

Idle hr = 20000

Labor hr required = 230625 – 20000 = 210625

It will be: 210625 * 45 = 9478125

20000*45*60% = 540000

\[ \text{10018125} \]

**FIXED FOH:**

Only incremental FOH will be charged. Company is running at 80% capacity. Specific order requires 30% additional capacity. So 80% + 30% = 110% capacity is needed.

Enhance capacity = 110% - 100% = 10%

22000000 for 100%

22000000/100% = 220000 for 10% capacity

220000*10 (for 10% capacity) * 1.5 = 3300000

**Total cost will be:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>17033125</td>
</tr>
<tr>
<td>Labor</td>
<td>10018125</td>
</tr>
<tr>
<td>V/FOH</td>
<td>5765625</td>
</tr>
<tr>
<td>F/FOH</td>
<td>3300000</td>
</tr>
</tbody>
</table>

\[ \text{36116875} \]

Profit is 20% of Sale price

\[ \text{X} - 0.2x = 36116875 \quad \Rightarrow 0.8x = 36116875 \quad \Rightarrow x = 36116875/0.8 = 45146093.75 \]

Sale Price = 45146093.75 / 150000 = 300.97
Q # 8 [Spring – 2001]

**Sale:**
- Sale (99) \(=\) 6500
- Sale (2000) \(=\) 6000 (7200/120%)
- Decrease in qty \(=\) 500
- Ratio of fall in qty \(=\) 500/6500 \(=\) 1/13

**Material:** Decrease in qty is 1/13th; VC should decrease to 12/13th.
- Cost of (2000) \(=\) 3600 (3900*12/13)
- Actual Cost (2000) \(=\) 3400
- Reduction in MC \(=\) 200

**Sale Price:**
- Sale (7200/120%) \(=\) 6000
- Actual Cost \(=\) 7200
- Change \(=\) 1200

**Sale Volume:**
- CM (2600*1/13) \(=\) 200

Or
- Fall in sale (6500*1/3) \(=\) 500
- Fall in VC (3900*1/13) \(=\) 300
- Fall in CM \(=\) 200

**Fixed Cost:**
- Increase in FC \(=\) 200

**Effect:**
- Fall in MC \(=\) 200
- Increase in SP \(=\) 1200
- Decrease in SP \(=\) 1000
- Increase in FC \(=\) 200
- Net Profit \(=\) 1200
Illustration of above:

**Year: 1**
- Actual Qty = 10000 unit
- Consumption of DM = 3 kg
- DM consume = 30000 kg (10000*3)
- AR = 4
- AC = Rs: 120000 (10000*3*4)

**Year: 2**
- Actual Qty = 10% increase (10000+10% = 11000)
- Consumption of DM per unit = 5% increase (3+5% = 3.15)
- AR = 15% increase (4+15% = 4.6)
- AC = Rs: 159930 (11000*3.15*4.6)

120000-159930 = 39390 (A)

**Check:**
- Price : 20790 (A) (159390 * 15/115) OR 34650 (4.6-4)
- VOL : 12000 (A) (120000 * 10%)
- Qty : 6600 (A) (Balancing figure) OR 4 (34650-33000) =6600(A)
- Price + Vol + Qty = 20790 (A) + 12000 (A) + 6600 (A) = 39390 (A)
- Efficiency Var : SR (AQ – SQA) = 4(34650-33000) = 6600(A)
Q # 6 [Autumn – 2004]

<table>
<thead>
<tr>
<th></th>
<th>Without Discount</th>
<th>With Discount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material (42*37)</td>
<td>1554</td>
<td>1549.8</td>
</tr>
<tr>
<td>(42*36.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Labor</td>
<td>850</td>
<td>850</td>
</tr>
<tr>
<td>Direct Material</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td><strong>Total Variable Cost</strong></td>
<td><strong>2704</strong></td>
<td><strong>2699.8</strong></td>
</tr>
<tr>
<td>Sale Price</td>
<td>2862</td>
<td>2862</td>
</tr>
<tr>
<td><strong>C/M</strong></td>
<td><strong>158</strong></td>
<td><strong>162.2</strong></td>
</tr>
<tr>
<td>Annual FC</td>
<td>6007320</td>
<td>6307320</td>
</tr>
<tr>
<td><strong>BE Unit (FC / CM per unit)</strong></td>
<td><strong>38021</strong></td>
<td><strong>38886</strong></td>
</tr>
</tbody>
</table>

Q # 6 [Spring – 2005]

Main Point = No VC is given, then all Sale Price will be assumed to be C/M.

Req # 01

<table>
<thead>
<tr>
<th></th>
<th>4550/4000</th>
<th>4550/5000</th>
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</thead>
<tbody>
<tr>
<td>BEP</td>
<td>1138</td>
<td>910</td>
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Req # 02

<table>
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<tr>
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<th>3550</th>
<th>3550</th>
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</thead>
<tbody>
<tr>
<td>Revise FC</td>
<td>3000</td>
<td>3750</td>
</tr>
<tr>
<td>BEP</td>
<td>1138</td>
<td>947</td>
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</tbody>
</table>

Req # 03

Note: Eliminate the difference will be indifferent.

<table>
<thead>
<tr>
<th></th>
<th>1000/1000 (4000*25%)</th>
<th>1000/1250 (5000*25%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of Tickets (for indifferent point)</td>
<td>1000</td>
<td>800</td>
</tr>
</tbody>
</table>

Req # 04

1. Demand / good will in market
2. Availability of alternatives
3. Nature of concert
4. Taste of audience
5. Area
6. Expectation of sale of ticket
Q # 7 [Autumn – 2005]

Sale Price = 1000 per unit
Other VC = 600 per unit
Commission & discount = 5% of Sales

Note for students:
Other variable cost per unit will remain constant in case for fall in sale price. Where commission & discount per unit will also fall if there is fall in sale price.

Q # 7 [Spring – 2006]

Computation of sale price:

Direct Material = 193600
Direct Labor = 90000
Over Head = 80000
Admin = 30000
Total Cost (82% of sales) = 393600
Add – Commission (8% of sales): (393600*8%) = 38400
Net Profit (10% of sales)

Q # 2 [Nov – 1996]

There is nothing in the question. Student will get confused due to Marks: 14 given in the question & wrote lot of irrelevant material & lost precious marks & time.

Q # 8 [Autumn – 2000]

Net profit : 412500
FC = 127500
Contribution = 540000
C/M per unit (15-6) = 9
Sales (540000/9) = 60000
Q # 5 [Spring – 2004]

It is assume that minimum order qty is purchase order. Limiting factor is availability of funds.

Available funds:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Working Capital</td>
<td>=  800000</td>
<td></td>
</tr>
<tr>
<td>Running Finance</td>
<td>=  50000</td>
<td></td>
</tr>
<tr>
<td>Less – Admin</td>
<td>=  152700</td>
<td></td>
</tr>
<tr>
<td>Marketing</td>
<td>=  72842</td>
<td></td>
</tr>
<tr>
<td>Finance Cost (500000*24%*6/12)</td>
<td>=  60000</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>=  285542</td>
<td></td>
</tr>
<tr>
<td>Total Grand</td>
<td>=  1014458</td>
<td></td>
</tr>
</tbody>
</table>

Sale          | 318 | 421 | 280
VC            | 248 | 345 | 204
C/M           | 70  | 76  | 76
C/M % ( C/M /VC*100) | 28% | 22% | 37%
Ranking       | 2   | 3   | 1   

Q # 7 [Spring – 2007]

<table>
<thead>
<tr>
<th></th>
<th>Dress</th>
<th>Scarf</th>
<th>Handbag</th>
</tr>
</thead>
<tbody>
<tr>
<td>60% completed</td>
<td>11700</td>
<td>11700</td>
<td>11700</td>
</tr>
<tr>
<td>10% dress &amp; scarf</td>
<td>1950</td>
<td>1950</td>
<td>-</td>
</tr>
<tr>
<td>20% dress &amp; handbag</td>
<td>3900</td>
<td>-</td>
<td>3900</td>
</tr>
<tr>
<td>10% dress only</td>
<td>1950</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total Units (15000 * 30% = 19500)</td>
<td>19500</td>
<td>13650</td>
<td>15600</td>
</tr>
<tr>
<td>Existing Units</td>
<td>15000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Incremental Units</td>
<td>4500</td>
<td>13650</td>
<td>15600</td>
</tr>
</tbody>
</table>

Incremental Sales Value

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dress</td>
<td>(4500*2000)</td>
<td>9000000</td>
</tr>
<tr>
<td>Scarf</td>
<td>(13650*400)</td>
<td>5460000</td>
</tr>
<tr>
<td>Handbag</td>
<td>(15600*500)</td>
<td>7800000</td>
</tr>
<tr>
<td>Total Sales</td>
<td></td>
<td>22260000</td>
</tr>
</tbody>
</table>

Incremental Costs

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>(4500<em>3.5</em>100)</td>
<td>1575000</td>
</tr>
<tr>
<td>Cost of designer</td>
<td></td>
<td>150000</td>
</tr>
<tr>
<td>Hooks</td>
<td>(15600*8)</td>
<td>124800</td>
</tr>
</tbody>
</table>
Reduction in Resale value:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing (15000*20)</td>
<td>300000</td>
<td></td>
</tr>
<tr>
<td>Revised (19500*5)</td>
<td>(97500)</td>
<td>202500</td>
</tr>
</tbody>
</table>

Cutting Costs:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dress (4500*35)</td>
<td>157500</td>
<td></td>
</tr>
<tr>
<td>Scraf (13650*75)</td>
<td>204750</td>
<td></td>
</tr>
<tr>
<td>Handbag (15600*20)</td>
<td>312000</td>
<td>674250</td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dress (4500<em>2000</em>40%)</td>
<td>3600000</td>
<td></td>
</tr>
<tr>
<td>Scraf (13650<em>400</em>55%)</td>
<td>3003000</td>
<td></td>
</tr>
<tr>
<td>Handbag (15600<em>500</em>60%)</td>
<td>4680000</td>
<td>11283000</td>
</tr>
</tbody>
</table>

Total Costs: (14009550)

Incremental Profit: 8250450

Q # 7 [Autumn – 2003]

Req # 01

<table>
<thead>
<tr>
<th></th>
<th>Semi</th>
<th>Auto</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy Cost</td>
<td>2000</td>
<td>2000</td>
</tr>
<tr>
<td>Variable Manufacturing Cost</td>
<td>1500</td>
<td>1200</td>
</tr>
<tr>
<td>Savings</td>
<td>500</td>
<td>200</td>
</tr>
<tr>
<td>FC</td>
<td>5000000</td>
<td>10000000</td>
</tr>
<tr>
<td>Quantity to justify (FC / Savings)</td>
<td>10000</td>
<td>12500</td>
</tr>
</tbody>
</table>

Req # 02

<table>
<thead>
<tr>
<th></th>
<th>Semi</th>
<th>Auto</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Requirement</td>
<td>15000</td>
<td>15000</td>
</tr>
<tr>
<td>Savings</td>
<td>500</td>
<td>800</td>
</tr>
<tr>
<td>Total Savings</td>
<td>7500000</td>
<td>12000000</td>
</tr>
<tr>
<td>FC</td>
<td>5000000</td>
<td>10000000</td>
</tr>
<tr>
<td>Net Saving</td>
<td>2500000</td>
<td>2000000</td>
</tr>
</tbody>
</table>

Req # 03

Difference in VC savings = 300 per unit
Difference in FC = 5000000
Quantity to justify allocation = 16667 (5000000/300)
**Q # 3 [Autumn – 2007]**

\[
\begin{align*}
\text{Finished Goods} &= \frac{20000}{97\%} = 20619 \\
\text{Raw Material} &= \frac{20619}{98\%} = 21040 \\
\text{Direct Material} &= 21040 \times 42.3 = 889992
\end{align*}
\]

Assume = 1 kg equals 1 unit.

**Q # 3 [Spring – 1998]**

Duty drawback is an income in case of export. It is paid on import time & will be refunded later.

**Q # 8 [Spring – 2005]**

\[
\begin{align*}
\text{C/M Per unit} &= \frac{4500000}{300000} + 30 = 45
\end{align*}
\]

**Effect on profit:**

a) **Stitching elimination**

- Loss of C/M \((300000 \times 10\% = 30000 \times 45) = 1350000\)
- Reduction of VC \((300000-10\% = 270000 \times 6) = 162000\)
- Net Benefit \(= 270000\)

b) **Use of plastic eye**

- Cost of glass eye \((300000-10\% = 270000 \times 2/95\% \times 4/100) = 227368\)
- Cost of plastic eye \((300000-10\% = 270000 \times 2/90\% \times 3/100) = 180000\)
- Net Benefit \(= 47368\)

c) **Filling material**

- Cost of synthetic \((300000-10\% = 270000 \times 2000 \times 1600) = 216000\)
- Net loss of using scrap \((300000-10\% = 270000 \times 1) = 270000\)
- Net Benefit \(= (54000)\)
- **NET EFFECT** \(= 263368\)

**Q # 4 [Autumn – 2010]**

Note: This question is a copy of same question from 100 Qs & As by Chart Foulk Lynch
Unit produce:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale</td>
<td>21000</td>
</tr>
<tr>
<td>Closing Stock (21000*10%)</td>
<td>2100</td>
</tr>
<tr>
<td>Opening Stock (19000*5%)</td>
<td>(950)</td>
</tr>
<tr>
<td><strong>Unit Made</strong></td>
<td>22150</td>
</tr>
</tbody>
</table>

**Total & Per Unit Fixed FOH =**

- Annual Fixed FOH on 30-06-11 (6000000*1.08) = 6480
- Train Cost = 300
- **Total** = 6780

Per Unit (2011) = 6780/22150 = 306.09

Per Unit (2010) = 6000/18000 = 333.33

**VC per unit on 30-06-11 =**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Material (5 kg * 95% = 4.75<em>60</em>4%)</td>
<td>62.4</td>
</tr>
<tr>
<td>Material Inspect (4.75*2)</td>
<td>9.50</td>
</tr>
<tr>
<td>Labor (4<em>85%=3.4</em>75*1.1)</td>
<td>280.50</td>
</tr>
<tr>
<td>Labor Incentive (4<em>15% =0.6</em>82.5(75+10%)*30%)</td>
<td>14.85</td>
</tr>
<tr>
<td>V/FOH (15<em>1.05</em>3)</td>
<td>47.25</td>
</tr>
<tr>
<td>Variable Selling (10 m * 30% /19000)</td>
<td>157.89</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>806.39</td>
</tr>
</tbody>
</table>

**VC per unit on 30-06-10 for Opening Stock =**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Material (5*60)</td>
<td>300</td>
</tr>
<tr>
<td>Labor (4*75)</td>
<td>300</td>
</tr>
<tr>
<td>V/FOH (15*3)</td>
<td>45</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>645</td>
</tr>
</tbody>
</table>

**Profit:**

- **MC = (7610865)**
- **AC = (7284740)**
Q # 4 [Spring – 2012]

(a) How many units of the small pack of product-B should be sold to achieve break-even?

\[
\text{Rs.} \\
\text{Fixed Cost (7600000*12)} & 91200000 \\
\text{Target Profit} & - \\
\text{Required Contribution} & 91200000 \\
\text{Less – A (Large) = (250000*120 <W-1>)} & 30000000 \\
\text{B (Small) = (150000*45 <W-2>)} & 6750000 \\
\text{B (Large) = (225000*150 <W-3>)} & 33750000 \\
\hline
\text{Required Contribution} & (70500000) \\
\text{Sales} & 20700000 \\
\hline
\text{B (Small) C/M Per Unit <W-4>} & 90 \\
\text{Number of Unit Sold (Small Pack: B)} & 230000
\]

\text{W-1:}

\begin{align*}
A & = \text{large Pack} \\
\text{C/M} & = \text{Sale – VC} \\
25\% & = 100\% - 75\% \\
\text{VC} & = 120/25*75 = 360 \\
\text{Sale} & = 120/25*100 = 480 \\
\text{C/M} & = 480-360=120
\end{align*}

\text{W-2:}

\begin{align*}
A & = \text{Small Pack} \\
\text{VC} & = 360*67.5\% = 243 \\
\text{As the ratio of the selling price of both the packs of product-A are same as the ratio of their quantities, Sales will be as follows:} \\
\text{Sale} & = 480*3/5 = 288 \\
\text{C/M} & = 288-243=45
\end{align*}

\text{W-3:}

\begin{align*}
B & = \text{large Pack} \\
\text{C/M} & = \text{Sale – VC} \\
\text{As the ratio of contribution margin to variable cost for the large pack of product-B is 2:3, C/M will be as follows:} \\
\text{Here, C/M} & = 2 \\
\text{VC} & = 3 \\
\text{C/M} & = \text{Sale – VC} \\
2 & = 5 - 3 \\
\text{Sale} & = 150/2*5 = 375 \\
\text{VC} & = 150/2*3 = 225 \\
\text{C/M} & = 325 – 225 = 150
\end{align*}

\text{W-4:}

\begin{align*}
B & = \text{Small Pack} \\
\text{Sale} & = 375*64\% = 240 \\
\text{As the ratio of the VC is not given, we will assume that VC of both the packs of product-A are same as the ratio of their quantities, VC will be as follows:} \\
\text{VC} & = 225*2/3 = 150 \\
\text{C/M} & = 240-150 = 90
\end{align*}
(b) How many units of the small pack of product-B should be sold to earn a net income of Rs. 10,530,000? Applicable tax rate for the company is 25%.

Fixed Cost \( (7600000 \times 12) \) 91200000
Target Profit \( \frac{10530000}{1 - 0.25} \) 14040000
Required Contribution 105240000

\[
\text{Less – A (Large)} = (250000 \times 120 <W-1>) \quad 30000000 \\
\text{B (Small)} = (150000 \times 45 <W-2>) \quad 6750000 \\
\text{B (Large)} = (225000 \times 150 <W-3>) \quad 33750000 \\
\]
\[
\text{B (Small) C/M Per Unit <W-4}> 90 \\
\text{Number of Unit Sold (Small Pack: B)} 386000
\]

(c) Based on the results of (b) above prepares a product wise and consolidated income statement for the period ending 31 December 2012.

<table>
<thead>
<tr>
<th>Products</th>
<th>Sale Per Unit</th>
<th>VC Per Unit</th>
<th>Sale Volume</th>
<th>Sales</th>
<th>VC</th>
<th>C/M</th>
</tr>
</thead>
<tbody>
<tr>
<td>A – Large Pack</td>
<td>480</td>
<td>360</td>
<td>250000</td>
<td>120000000</td>
<td>90000000</td>
<td>30000000</td>
</tr>
<tr>
<td>A – Small Pack</td>
<td>288</td>
<td>243</td>
<td>150000</td>
<td>43200000</td>
<td>36450000</td>
<td>6750000</td>
</tr>
<tr>
<td>B – large Pack</td>
<td>375</td>
<td>225</td>
<td>225000</td>
<td>84375000</td>
<td>50625000</td>
<td>33750000</td>
</tr>
<tr>
<td>B – Small Pack</td>
<td>240</td>
<td>150</td>
<td>386000</td>
<td>92640000</td>
<td>57900000</td>
<td>34740000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Products</th>
<th>Sales</th>
<th>Less - VC</th>
<th>C/M</th>
<th>Budgeted Profit Before Tax</th>
<th>Less - Tax</th>
<th>Budgeted Profit After Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>340215000</td>
<td>(234975000)</td>
<td>105240000</td>
<td>14040000</td>
<td>(3510000)</td>
<td>10530000</td>
</tr>
</tbody>
</table>

Q # 8 [Autumn – 2012]

1. Manager annual salary amounting Rs: 2500/- is irrelevant as it is past cost.
2. Fixed Overhead @ Rs: 25/- per DLH is irrelevant for decision making.
3. Motor adjustment will be as follows:
4. Where there is required balance less than the available balance & material is of regular use, we will always work out relevant cost as follows:

Required units * current replacement price

120*68 = Rs: 8160

5. Where minimum quantity is given, this is the required units & remaining units is of no use to entity hence being irrelevant. Relevant cost will be calculated as: 60*10 = Rs: 600/-. 

6. Whenever we bought any material from outside market, then full purchase cost will be relevant. Therefore, relevant cost is: Rs: 2400 (30*80).

7. Labor Case:
   - 100 hours are idle hours (spare capacity) & idle hours are always irrelevant for decision making.
   - There are two alternatives given in labor case which means that there is opportunity cost. In opportunity cost, lower of two alternatives will always be selected.
   - Alternative # 01: Overtime is Rs: 3450/- (23 * 150)
   - Alternative # 02: Temporary workers cost is Rs: 3150/- (21*150) + Rs: 100 (20*5) = Rs: 3250/-. 
   - Lower of Rs: 3450/- or Rs: 3250/- will be selected. Hence Rs: 3250/- will be selected for Direct Labor cost.

8. Monthly rent of Rs: 5000/- relates to last year & hence irrelevant.

9. Spare capacity of 110 hours is irrelevant for decision making.

10. Guarantee rate of Rs: 20/- is irrelevant.

Q # 3 [Autumn – 2012]

Assume that:

\[ X = \% \text{ of Direct Labor (FOH)} \]
\[ Y = \% \text{ of Direct Material (AOH)} \]
We know that total cost is calculated as follows:

Direct Material + Direct Labor + Direct Expenses + Factory Overhead

Applying the above formula on data given in the question:

<table>
<thead>
<tr>
<th></th>
<th>Petal</th>
<th>Leaf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material</td>
<td>20000 (250*80)</td>
<td>16000 (125*128)</td>
</tr>
<tr>
<td>Direct Labor</td>
<td>18000 (720*25)</td>
<td>24000 (960*25)</td>
</tr>
<tr>
<td>Factory Overhead</td>
<td>18000 X</td>
<td>24000 X</td>
</tr>
<tr>
<td>Admin Overhead</td>
<td>20000 Y</td>
<td>16000 Y</td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td><strong>52000 (Calculated as below)</strong></td>
<td><strong>56000 (Calculated as below)</strong></td>
</tr>
</tbody>
</table>

We know the formula of Profit i.e. Profit = Sale – Cost. Apply this formula on data given in the question:

**25% ON COST**

Profit = Sale – Cost

25% = 125% - 100%

= 65000/125*100 = 52000.

**30% ON SALES PRICE**

Profit = Sale – Cost

30% = 100% - 70%

= 80000/100*70 = 56000.

38000 + 18000 X + 20000 Y = 52000 - - - - - Equ: 1

40000 + 24000 X + 24000 Y = 56000 -------- Equ: 2

Multiply equation # 2 with 0.75, we will get:

30000 + 18000 X + 12000 Y = 42000

So, we get this equation:

38000 + 18000 X + 20000 Y = 52000

30000 + 18000 X + 12000 Y = 42000

8000 + 0 X + 8000 Y = 10000

8000 Y = 10000-8000
Applying Y: 25% on equation # 01, we will get:

\[
\begin{align*}
38000 + 18000 \times X + 20000 \times (0.25) &= 52000 \\
38000 + 18000 \times X + 20000 &\times 0.25 = 52000 \\
43000 + 18000 \times X &= 52000 \\
18000 \times X &= 52000 - 43000 \\
18000 \times X &= 9000 \\
X &= \frac{9000}{18000} = 50\
\end{align*}
\]

**Check:** If we apply X: 50% & Y: 25% on the variables given in the table, we will get the same answers.

<table>
<thead>
<tr>
<th></th>
<th>Petal</th>
<th>Leaf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material</td>
<td>20000 (250*80)</td>
<td>16000 (125*128)</td>
</tr>
<tr>
<td>Direct Labor</td>
<td>18000 (720*25)</td>
<td>24000 (960*25)</td>
</tr>
<tr>
<td>Factory Overhead</td>
<td>9000 (18000*50%)</td>
<td>12000 (24000*50%)</td>
</tr>
<tr>
<td>Admin Overhead</td>
<td>5000 (20000*50%)</td>
<td>4000 (16000*50%)</td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td><strong>52000</strong></td>
<td><strong>56000</strong></td>
</tr>
</tbody>
</table>

**Q # 5 [Autumn – 2012]**

<table>
<thead>
<tr>
<th>Required</th>
<th>Material – A</th>
<th>Material – B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha (900 + 200 = 1100)</td>
<td>2200 (1100*2)</td>
<td>2200 (1100*2)</td>
</tr>
<tr>
<td>Beta (3000 + 300 = 3300)</td>
<td>0 (3300*0)</td>
<td>9900 (3300*3)</td>
</tr>
<tr>
<td>Gamma (5000 + 400 = 5400)</td>
<td>16200 (5400*3)</td>
<td>21600 (5400*4)</td>
</tr>
<tr>
<td></td>
<td>18400</td>
<td>33700</td>
</tr>
<tr>
<td>Available</td>
<td>(22000)</td>
<td>(34000)</td>
</tr>
<tr>
<td>Excess</td>
<td>(3600)</td>
<td>(300)</td>
</tr>
</tbody>
</table>

Limiting factor will either be given in the question or calculated as follows:

Cost / Per Hour Rate
Variable Overhead for Zeta will be calculated as follows:

<table>
<thead>
<tr>
<th></th>
<th>Alpha</th>
<th>Beta</th>
<th>Gamma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine Hour (02)</td>
<td>1.6/8 = 0.2</td>
<td>1.4/7 = 0.2</td>
<td>1.2/6 = 0.2</td>
</tr>
<tr>
<td>Labor Hour (01)</td>
<td>1.5/2.5 = 0.6</td>
<td>1.8/3 = 0.6</td>
<td>1.5/2.5 = 0.6</td>
</tr>
<tr>
<td>Total Per Unit Cost:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine Hour</td>
<td>2*0.2 = 0.4</td>
<td>2*0.2 = 0.4</td>
<td>2*0.2 = 0.4</td>
</tr>
<tr>
<td>Labor Hour</td>
<td>1*0.6 = 0.6</td>
<td>1*0.6 = 0.6</td>
<td>1*0.6 = 0.6</td>
</tr>
<tr>
<td>Total</td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
</tr>
</tbody>
</table>

**Optimal Mix:**

Available = 34000
Less – Beta (3300*3) = (9900)
24100
Less – Gamma (5400*4) = (21600)
2500
Less – Alpha (1100*2) = (2200)
300
Less – Zeta (120*2.5) = (300) **NIL**

Zeta will have to make 120 units & buy 480 (600-120) rest units from outside.
Q # 7 [Autumn – 2012]

<table>
<thead>
<tr>
<th></th>
<th>5 Months</th>
<th>7 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capacity</strong></td>
<td>87500</td>
<td>161000</td>
</tr>
<tr>
<td></td>
<td>(300000<em>5/12</em>70%)</td>
<td>(300000<em>7/12</em>92%)</td>
</tr>
<tr>
<td><strong>Sale Price (87500*34)</strong></td>
<td>297500</td>
<td>?</td>
</tr>
<tr>
<td><strong>Direct Material (87500<em>12) &amp; (161000</em>12)</strong></td>
<td>(1050000)</td>
<td>(1932000)</td>
</tr>
<tr>
<td><strong>Direct Labor (Higher of Rs: 8/- OR Rs: 150000 per month)</strong></td>
<td>(750000)</td>
<td>(1288000)</td>
</tr>
<tr>
<td><strong>Variable Overhead (87500<em>6) &amp; (161000</em>6)</strong></td>
<td>(262500)</td>
<td>(472500)</td>
</tr>
<tr>
<td><strong>Semi Variable</strong></td>
<td>(262500)</td>
<td>(472500)</td>
</tr>
<tr>
<td><strong>Fixed Overhead (750000<em>5/12) &amp; (750000</em>7/12)</strong></td>
<td>(312500)</td>
<td>(437500)</td>
</tr>
<tr>
<td><strong>Profit</strong></td>
<td>75000</td>
<td>509600</td>
</tr>
<tr>
<td><strong>Cost for 7 months</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Semi-variable cost will be calculated as follows:

<table>
<thead>
<tr>
<th>Capacity</th>
<th>At 55% Capacity</th>
<th>At 70% Capacity</th>
<th>At 92% Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>37500 (450000/12)</td>
<td>52500 (4500000+180000 = 630000/12)</td>
<td>67500 (630000+180000 = 810000/12)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>262500 (52500*5)</td>
<td>472500 (67500*7)</td>
</tr>
</tbody>
</table>

We know that required sale price is calculated as: Required contribution/Unit Produced

Total profit for the year = 5 Months Profit + 7 months Profit
936000 = 75000 + 7 months Profit
7 months Profit = 936000-75000 = 861000

Putting the data in the formula:

Required Contribution = Fixed Cost + Target Profit
Unit Produced

= 861000 + 5096000

161000

= Rs: 37 Per Unit
Q # 1(b):
Marginal revenues and marginal costs can also be calculated in this fashion at different levels of demand.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Marginal Revenue</th>
<th>Marginal Cost</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>-</td>
<td>-</td>
<td>26000</td>
</tr>
<tr>
<td>1100</td>
<td>2 (55-53)</td>
<td>1 (29-28)</td>
<td>27500</td>
</tr>
<tr>
<td>1200</td>
<td>1 (53-52)</td>
<td>1 (28-27)</td>
<td>30000</td>
</tr>
<tr>
<td>1300</td>
<td>3 (52-49)</td>
<td>1 (27-26)</td>
<td>29900</td>
</tr>
</tbody>
</table>

Maximum profit will be at 1200 units @ Rs: 30000/-.  

Q # 2:
Labour cost per piece at 10% intervals between 60% and 130% efficiency, assuming that at 100% efficiency 80 pieces are produced per day is calculated as follows:

<table>
<thead>
<tr>
<th>Efficiency Intervals</th>
<th>Output</th>
<th>Piece Rate</th>
<th>Total Wages</th>
<th>Labor Cost Per Piece</th>
</tr>
</thead>
<tbody>
<tr>
<td>60%</td>
<td>48</td>
<td>3</td>
<td>168</td>
<td>3.5 (168/48)</td>
</tr>
<tr>
<td>70%</td>
<td>56</td>
<td>3</td>
<td>168</td>
<td>3 (168/56)</td>
</tr>
<tr>
<td>80%</td>
<td>64</td>
<td>3</td>
<td>192</td>
<td>3 (192/64)</td>
</tr>
<tr>
<td>90%</td>
<td>72</td>
<td>3.6 (3*120%)</td>
<td>259</td>
<td>3.6 (259/72)</td>
</tr>
<tr>
<td>100%</td>
<td>80</td>
<td>3.6 (3*120%)</td>
<td>288</td>
<td>3.6 (288/80)</td>
</tr>
<tr>
<td>110%</td>
<td>88</td>
<td>3.9 (3*130%)</td>
<td>343</td>
<td>3.90 (343/88)</td>
</tr>
<tr>
<td>120%</td>
<td>96</td>
<td>3.9 (3*130%)</td>
<td>374</td>
<td>3.90 (374/96)</td>
</tr>
<tr>
<td>130%</td>
<td>104</td>
<td>3.9 (3*130%)</td>
<td>405</td>
<td>3.90 (405/104)</td>
</tr>
</tbody>
</table>

Output will be calculated as follows:

\[
\begin{align*}
100 & \rightarrow 80 \\
60 & \rightarrow ? \\
60\% &= \frac{60}{100}*80 = 48. \\
70\% &= \frac{70}{100}*80 = 56.
\end{align*}
\]
80% = 80/100*80 = 64.
90% = 90/100*80 = 72.
100% = 100/100*80 = 80.
110% = 110/100*80 = 88.
120% = 120/100*80 = 96.
130% = 130/100*80 = 104.

Q # 6:
Tested units’ means final product ready for sold. There should be department for testing & the cost would be associated to testing the units. We can refer to this as Unit Transferred.

ATTEMPT = [AUTUMN – 2011]

Q # 3:

1. Production cost budget = DM + DL + V/FOH + F/FOH
2. Direct Labor will be calculated as follows:

\[ \frac{75000}{4} = 18750 + 10\% = 20625 \times 0.96 \times 3 = 64453. \]

Q # 4:

EPR will be calculated as follows

\[ \text{EPR} = \text{WIP} \% \times \text{Completion} \% \]

<table>
<thead>
<tr>
<th>WIP %</th>
<th>Completion %</th>
</tr>
</thead>
<tbody>
<tr>
<td>50%</td>
<td>40%</td>
</tr>
<tr>
<td>20%</td>
<td>30%</td>
</tr>
<tr>
<td>30%</td>
<td>24.5%</td>
</tr>
</tbody>
</table>

\[ 20\% \times 40\% = 8\% \times 3 = 24.5\% \times 24.5\% = 6\% \]

\[ 20\% \times 30\% = 6\% \times 3 = 18\% \times 3 = 54\% \times 3 = 162\% \]

\[ 30\% \times 24.5\% = 7.35\% \times 3 = 22.05\% \]

\[ 33.35\% \]

Q # 6:

1. When variable cost will not be given, then all variable cost is cost of good sold.
2. Average stock level = Min + Max / 2

ATTEMPT = [AUTUMN – 2010]

Q # 1:

1. Direct labor hr will be used to allocate FOH.
2. Cost per unit = FOH cost / unit produced
Q # 3: Total input – net input – loss → 1.8-1.6-0.09 = 0.11

Q # 5:
1. Ignore cost of monthly payroll
2. Ignore fixed FOH.
3. Direct labor cost is not possible to calculate here.

ATTEMPT = [SPRING – 2010]

Q # 1:
Closing stock =
   i. Weighted avg – Opening stock + purchases
   ii. FIFO = Purchases
      Formula = Cost of purchase * closing stock
                 Purchases

Q # 2:
Average Inventory = EOQ/2 + Safety Stock
   6500/2+2000 = 5250

Carrying Cost = Average inventory * 17700 = 92925000 * 1% = 9292500

Ordering cost = 4224000*10% = 422400

Q # 3:
Material COX is introduced at the start of the process in department A and subsequently transferred to department B. Normal loss in department A is 5% of the units transferred.

<table>
<thead>
<tr>
<th>Total</th>
<th>Transfer + WIP + Normal Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>664500</td>
<td>Transfer + 24000 + Normal Loss</td>
</tr>
<tr>
<td>664500 – 24000</td>
<td>Transfer + Normal Loss</td>
</tr>
<tr>
<td>640500</td>
<td>Transfer + Normal Loss</td>
</tr>
<tr>
<td>105%</td>
<td>100% + 5%</td>
</tr>
<tr>
<td>Transfer to next deptt</td>
<td>640500 * 100/105 = 610000</td>
</tr>
<tr>
<td>Normal Loss of deptt – A</td>
<td>640500 * 5/105 = 30500</td>
</tr>
</tbody>
</table>

10% of the units processed are evaporated before the inspection stage.
This means this is Normal Loss & is calculated as follows:

Unit received by last deptt * 10% = 610000 * 10% = 61000

During the year, actual evaporation in department B was 10% higher than the estimated normal losses because of high level of Sulpher contents in natural gas used for processing.
Actual Loss = 110
Normal Loss = 100
Abnormal Loss = 10
Abnormal Loss Amount = 61000*10/100 = 6100

Q # 4:

1. Standard qty + Closing FG – Opening FG = Purchases
2. Purchases are calculated as follows:

<table>
<thead>
<tr>
<th>Standard Qty (unit made * per hr)</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add – Adverse Material Usage Variance (Variance /30)</td>
<td>XXX</td>
</tr>
<tr>
<td>Less – Favorable Material Usage Variance (Variance /30)</td>
<td>XXX</td>
</tr>
<tr>
<td>Add – Closing FG (Standard Qty * days given /365)</td>
<td>XXX</td>
</tr>
<tr>
<td>Less – Opening FG (Standard Qty * days given /365)</td>
<td>XXX</td>
</tr>
</tbody>
</table>

ATTEMPT = [AUTUMN – 2009]

Q # 2:

1. Always record actual FOH in FOH distribution sheet.
2. Actual FOH will be found at FOH distribution sheet.

Q # 3:

1. Total contribution % = Total contribution / total sales * 100
2. BEP = FC / Total contribution %

Q # 4:

1. Purchase Cost = Demand * unit price
2. Transport Cost = Quantity / Capacity * No of order = XXX * one trip cost given
3. Hired Cost = Highest EOQ * third party rate (add in second unit)
EXAM RUBRIC

DECISION MAKING

EXAM RUBRIC: Purchase new equipment which would cost Rs. 240 million and have a useful life of six years with no salvage value. The company uses straight-line method of depreciation.

ACCOUNTING TREATMENT: A notion that depreciation on new machine being a fixed cost will be ignored is partially correct. But at the same time it is relevant cost as it could, be avoided if the other equipment were purchased from external supplier.

EXAM RUBRIC: Fixed overhead: 1) Depreciation = 60 2) General overheads = 30

ACCOUNTING TREATMENT: Ignore fixed overhead of all types unless a direction is given in the question. Another option was to include these but in that case one should give a note explaining their assumption.

EXAM RUBRIC: Skilled labour can work on other contracts which are presently operated by semiskilled labour who have been hired on temporary basis at a cost of Rs. 325,000 per month. The company will need to give them a notice of 30 days before terminating their services.

ACCOUNTING TREATMENT: Skilled labour required for this contract could have been used to replace the semi-skilled workers who were working on other contracts and had been hired on temporary basis. The amount payable to such semi-skilled workers was Rs. 3.9 million (325,000x12). Consequently, many students took Rs. 3.9 million as the opportunity cost. In doing so, they ignored the information that even if the semi-skilled labour were laid off, 30 days salary would have to be paid to them and consequently the company will only be saving Rs. 3,575,000. On the other hand, many students erroneously took the opportunity cost as Rs. 4,225,000 i.e. equal to 13 months salaries of the unskilled labour.

EXAM RUBRIC:
1. DM rate: 42.3
2. Unit: 20000
3. Reject rate: 2%

ACCOUNTING TREATMENT:
1. DM cost will be calculated as follows = 20000*42.3*100/98
2. FG rejection rate will be calculated as follows = Cost /100-% * %

EXAM RUBRIC: Purchase cost plus additional charges

ACCOUNTING TREATMENT: Cost * 100/100+%
EXAM RUBRIC: Which component to be purchased from supplier

ACCOUNTING TREATMENT: Lowest cost will be ranked higher than highest cost.

EXAM RUBRIC:

<table>
<thead>
<tr>
<th>SALES</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refined</td>
<td>6</td>
<td>5.50</td>
<td>7</td>
</tr>
<tr>
<td>Unrefined</td>
<td>2.50</td>
<td>2.75</td>
<td>4</td>
</tr>
</tbody>
</table>

ACCOUNTING TREATMENT: When two revenue figures are given in the question, we will use incremental revenue.

<table>
<thead>
<tr>
<th>SALES</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refined</td>
<td>6</td>
<td>5.50</td>
<td>7</td>
</tr>
<tr>
<td>Unrefined</td>
<td>2.50</td>
<td>2.75</td>
<td>4</td>
</tr>
<tr>
<td>Incremental Revenue</td>
<td>3.5</td>
<td>2.75</td>
<td>3</td>
</tr>
</tbody>
</table>

EXAM RUBRIC:

<table>
<thead>
<tr>
<th></th>
<th>Pentagon</th>
<th>Hexagon</th>
<th>Octagon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales price per unit (Rs.)</td>
<td>2300</td>
<td>1550</td>
<td>2000</td>
</tr>
<tr>
<td>Material cost per Kg. (Rs.)</td>
<td>250</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Labour time per unit (Minutes)</td>
<td>20</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>Machine time per unit (Hours)</td>
<td>4</td>
<td>2.5</td>
<td>3</td>
</tr>
<tr>
<td>Net weight per unit of finished product (Kg.)</td>
<td>6</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Yield (%)</td>
<td>90</td>
<td>95</td>
<td>92</td>
</tr>
<tr>
<td>Estimated demand (Units)</td>
<td>10000</td>
<td>20000</td>
<td>9000</td>
</tr>
</tbody>
</table>

Each worker is paid monthly wages of Rs. 15,000 and works a total of 200 hours per month. BL’s total overheads are estimated at 20% of the material cost. Fixed overheads are estimated at Rs. 5 million per month and are allocated to each product on the basis of machine hours. 100,000 machine hours are estimated to be available in February 2012.

ACCOUNTING TREATMENT:

Material + Labor + Variable FOH will be calculated as follows:

<table>
<thead>
<tr>
<th></th>
<th>Pentagon</th>
<th>Hexagon</th>
<th>Octagon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Cost (Material cost per kg * Net Weight / Yield)</td>
<td>250*6/0.90 = 1666.67</td>
<td>250*4/0.95 = 1052.63</td>
<td>250*5/0.92 = 1358.70</td>
</tr>
<tr>
<td>Labour Cost</td>
<td>15000/200 = 75</td>
<td>15000/200 = 75</td>
<td>15000/200 = 75</td>
</tr>
<tr>
<td>* 20/60 = 25</td>
<td>*30/60 = 37.5</td>
<td>*45/60 = 56.25</td>
<td></td>
</tr>
<tr>
<td>Variable FOH (see box below for calculation)</td>
<td>133.33</td>
<td>85.33</td>
<td>121.74</td>
</tr>
</tbody>
</table>
Variable FOH calculation:

<table>
<thead>
<tr>
<th></th>
<th>Total Overhead = Fixed FOH + Variable FOH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20% of Material = Fixed FOH + Variable FOH</td>
</tr>
<tr>
<td>FOR PENTAGON:</td>
<td>1666.67<em>20% → 333.33 = 333.33 – 200 (5000000/100000</em>4) = 133.33</td>
</tr>
<tr>
<td>FOR HEXAGON:</td>
<td>1052.63<em>20% → 210.53 = 210.53 – 125 (5000000/100000</em>2.5) = 85.53</td>
</tr>
<tr>
<td>FOR OCTAGON:</td>
<td>1666.67<em>20% → 271.74 = 271.74 – 150 (5000000/100000</em>3) = 121.74</td>
</tr>
</tbody>
</table>

**BREAK EVEN POINT**

**NOTE:**

1. Whenever sales increases. All variable cost will increase unless specified.
2. No Variable cost, all sales price will be contribution margin.

**EXAM RUBRIC:** Compute the break-even point in units if the company offers a discount of 10% on purchase of 20 bottles or more, assuming that 20% of the sales will be to buyers who will avail the discount.

**ACCOUNTING TREATMENT:** Correct discount calculation will be:

10% discount on 20% of Rs: 16 → 16*20% = 3.2 *10% = 0.32 paisa per bottle.

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>175000</td>
<td>225000</td>
</tr>
<tr>
<td>Total Costs</td>
<td>1190000</td>
<td>16518600</td>
</tr>
</tbody>
</table>

Rate of inflation in 2007: 15%
Required: Variable cost & fixed costs in real terms.

**ACCOUNTING TREATMENT:** Real Rate for current year = current year cost /1+ inflation rate = 16518600/1.15 = 14364000.

<table>
<thead>
<tr>
<th></th>
<th>Production</th>
<th>Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>225000</td>
<td>14364000</td>
</tr>
<tr>
<td>2006</td>
<td>175000</td>
<td>1190000</td>
</tr>
<tr>
<td>Difference</td>
<td>50000</td>
<td>2464000</td>
</tr>
</tbody>
</table>

Variable cost per unit = 2464000/50000 = 49.28

Fixed cost = 14364000 – (225000*49.28) = 14364000 – 11088000 = 3276000
EXAM RUBRIC: When per unit cost of sales & variable cost is not given in breakeven mix case.

ACCOUNTING TREATMENT:

\[
\text{BEP} = \frac{\text{FIXED COSTS}}{C/M \times \text{individual ratio}}
\]

EXAM RUBRIC: What price per unit to be quoted for the next year if it is desired to earn 10% profit on sales assuming that the variable cost will increase by 10%, fixed cost by 10% & production by 10%.

Variable cost = 4400 → Unit = 1100 → FC = 1595000

ACCOUNTING TREATMENT:

When sales increase, variable expense increases by same ratio.

Sale = variable cost + fixed cost + profit

No of unit * sale price per unit = No of unit * variable cost per unit + fixed cost + No of unit * sale price per unit * 10%

\[
1100 \times S = 1100 \times 4400 + 1595000 + (1100 \times S) \times 10%
\]

\[
1100 \times S = 4840000 + 1595000 + 110S
\]

\[
1100 \times S - 110S = 6435000
\]

\[
S = 6435000 / 990
\]

\[
S = 6500 \text{ units}
\]

ENTRY:

EXAM RUBRIC: The valuation is carried out by the Finance Department using stores memorandum record.

ACCOUNTING TREATMENT: It exhibits that only quantity is recorded in the stores ledger.

LABOR

EXAM RUBRIC: bonus hours

ACCOUNTING TREATMENT: bonus hours will be compared with direct hours worked.
EXAM RUBRIC: Direct wages per unit, when overtime is worked:
   (i) Due to labor shortage.
   (ii) Specifically at the customer’s request, to expedite delivery.

ACCOUNTING TREATMENT:
   (i) Due to labor shortage.
When overtime was worked due to labor shortage, the overtime premium should have been excluded from direct wages per unit.

   (ii) Specifically at the customer’s request, to expedite delivery.
When overtime was worked on specific request of the customer to expedite delivery, the overtime premium should have been included in direct wages per unit.

EXAM RUBRIC:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of employees</td>
<td>180</td>
</tr>
<tr>
<td>Standard working hours (9 hours/day)</td>
<td>54</td>
</tr>
<tr>
<td>Standard hours per unit (at 100% efficiency)</td>
<td>3</td>
</tr>
<tr>
<td>Standard labour rate per hour (Rupees)</td>
<td>30</td>
</tr>
</tbody>
</table>

An analysis of the employee’s performance report has revealed that the company is suffering on account of the following:
   1. A tendency to waste time as a result of which approximately 9 working hours are lost per week per employee.
   2. A tendency to work inefficiently, as a result of which the production efficiency is only 74%.

In order to meet the increased demand, the management is considering an increase in wages by Rs. 5 per hour. The increase is likely to motivate the employees and reduce the wastage of time by 5 hours and will also improve the production efficiency to 88%. Calculate labor cost per unit.

ACCOUNTING TREATMENT:

1. At current wages = 30*3*54/45 = 145.92
2. After increase in wages = 35*3*54/49 = 131.49

54/45 & 54/49 represent the ratio between total hours per week & the actual hours that were worked.
EXAM RUBRIC: Most of the workers have raised objection on the company’s bonus plan. They are of the view that bonus calculation should be based on daily production instead of weekly production.

ACCOUNTING TREATMENT:

The amount of bonus worked out on daily basis was different from the amount worked out on weekly basis because in the latter case higher production on a particular day will be offset by lower production on other days.

EXAM RUBRIC: The workers are eligible for a “Guaranteed Day Rate “which is equal to 70% efficiency

ACCOUNTING TREATMENT: Upto 70% efficiency, guaranteed rate @ Rs: 168/- will eb paid being the rate used upto 70% efficiency.

EXAM RUBRIC: It is budgeted that the machine will work for 2,600 hours in 2008. The budgeted hours include:
- 80 hours for setting up the machine; and
- 120 hours for maintenance.

ACCOUNTING TREATMENT: Total hour – idle hour → 2600 – 200 (120+80 = 200) = 2400

EXAM RUBRIC: The cost of opening finished goods inventory determined under the absorption costing method system was Rs. 450,000.Fixed overhead constituted 16% of the total cost last year.

ACCOUNTING TREATMENT: Opening stock value = Rs: 450000 -16% fixed overhead cost.

EXAM RUBRIC: Fixed overhead cost for the year Rs. 1,000,000

Annual budgeted capacity of the plant units 40,000

ACCOUNTING TREATMENT: Fixed overhead rate will be calculated on annual budgeted capacity of the plant. If budgeted capacity is not given, then use normal capacity.
EXAM RUBRIC:

Direct materials per unit = 0.8 kg at Rs. 60 per kg
Labour per unit = 27 minutes at Rs. 80 per hour
Variable production overheads = Rs. 40 per labour hour
Fixed production overheads, at a normal output level of 105,000 units per month, are estimated at Rs. 2,100,000.

ACCOUNTING TREATMENT:

Material + Labor + Variable FOH will be calculated as follows:

Direct materials per unit = (120000*0.8*60) = 5760000
Labour per unit = (120000*27/60*80) = 4320000
Variable production overheads = (120000*27/60*40) = 2160000
Fixed production overheads = (2100000*120000/105000) = 2400000

- Where minutes are given, it will always be divided by 60.
- Production Cost (DM + DL + FOH) will be multiplied by production units & selling cost (selling FOH) by sale units unless stated otherwise & writes this assumption in the paper as note.

MATERIAL

EXAM RUBRIC: Godown rent of Rs. 10,000 per month

ACCOUNTING TREATMENT: This will not be included in carrying cost calculation.

EXAM RUBRIC: What would be the safety stock and re-order point if the company is willing to take:

1. a 20% risk of being out of stock?
2. a 10% risk of being out of stock?

ACCOUNTING TREATMENT: If the company is ready to take 20% risk of being out of stock meant that it needed to keep sufficient safety stock to ensure that it would only be out of stock if the lead time reached 13 days or in other words it would need to reorder when 12 days stock was left. i.e. the re-order point should be 12 days.

The average usage per day was 450 units (162000/360)

Since the usual lead time was 11 days, safety stock should be equal to 12-11=1 day’s stock i.e. 450 units & re-ordering point was 450*12 = 5400 units
EXAM RUBRIC:

Ordered Quantity | Unit price Rs.
--- | ---
Upto 999 units | 160.00
1000 to 1999 units | 158.40
2000 or more units | 156.80

ACCOUNTING TREATMENT:

1. Take lower class boundaries i.e 999, 1000 & 2000 as annual demand for calculating EOQ.
2. Quantity discount will be calculated as follows:
   i. Purchase Cost = unit made * cost per unit * (100% - % given)
   ii. Ordering Cost = Annual demand * ordering cost / EOQ
   iii. Carrying Cost = EOQ * Carrying Cost/2 * (100% - % given)

EXAM RUBRIC: When next order be placed?

ACCOUNTING TREATMENT:

1. Frequency = 365/ No of order
2. Days Supply left = Unit in inventory /EOQ * Frequency
3. Supply left – lead time

EXAM RUBRIC: Holding cost per year

ACCOUNTING TREATMENT: (EOQ /2 * safety stock) * Carrying cost

EXAM RUBRIC: ABC CHART

<table>
<thead>
<tr>
<th>Material Code</th>
<th>Yearly Usage</th>
<th>Unit Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX01</td>
<td>10000</td>
<td>0.50</td>
<td>5000</td>
</tr>
<tr>
<td>TX02</td>
<td>7100</td>
<td>0.65</td>
<td>4615</td>
</tr>
<tr>
<td>TX03</td>
<td>2000</td>
<td>2.50</td>
<td>5000</td>
</tr>
<tr>
<td>TX04</td>
<td>5250</td>
<td>2.00</td>
<td>10500</td>
</tr>
<tr>
<td>TX05</td>
<td>6000</td>
<td>1.75</td>
<td>10500</td>
</tr>
<tr>
<td>TX06</td>
<td>2750</td>
<td>0.80</td>
<td>2200</td>
</tr>
<tr>
<td>TX07</td>
<td>1500</td>
<td>1.00</td>
<td>1500</td>
</tr>
<tr>
<td>TX08</td>
<td>5500</td>
<td>1.85</td>
<td>10175</td>
</tr>
</tbody>
</table>
ACCOUNTING TREATMENT:

1. Per unit will decide which unity falls in A, B & C
2. Unit & total cost will be used for calculating A, B & C
3. Unit/usage * per unit = total cost

<table>
<thead>
<tr>
<th>Material Code</th>
<th>Yearly Usage</th>
<th>Unit Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX03</td>
<td>2000</td>
<td>2.50</td>
<td>5000</td>
</tr>
<tr>
<td>TX04</td>
<td>5250</td>
<td>2.00</td>
<td>10500</td>
</tr>
<tr>
<td>A</td>
<td>7250 (18.08%)</td>
<td></td>
<td>15500 (31.31%)</td>
</tr>
<tr>
<td>TX05</td>
<td>6000</td>
<td>1.75</td>
<td>10500</td>
</tr>
<tr>
<td>TX07</td>
<td>1500</td>
<td>1.00</td>
<td>1500</td>
</tr>
<tr>
<td>TX08</td>
<td>5500</td>
<td>1.85</td>
<td>10175</td>
</tr>
<tr>
<td>B</td>
<td>20250 (50.49%)</td>
<td></td>
<td>37675 (76.12%)</td>
</tr>
<tr>
<td>TX06</td>
<td>2750</td>
<td>0.80</td>
<td>2200</td>
</tr>
<tr>
<td>TX01</td>
<td>10000</td>
<td>0.50</td>
<td>5000</td>
</tr>
<tr>
<td>TX02</td>
<td>7100</td>
<td>0.65</td>
<td>4615</td>
</tr>
<tr>
<td>C</td>
<td>40100 (100%)</td>
<td></td>
<td>49490 (100%)</td>
</tr>
</tbody>
</table>

EXAM RUBRIC: Reconcile the physical inventory balances with the balances as per book.

ACCOUNTING TREATMENT:

<table>
<thead>
<tr>
<th>Opening balance (Opening Balance + Receipts – Issue)</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less – Contamination</td>
<td>(XXX)</td>
</tr>
<tr>
<td>Add – Not included in Books</td>
<td>XXX</td>
</tr>
<tr>
<td>Add – Return by production Deptt</td>
<td>XXX</td>
</tr>
<tr>
<td>Less – Wrong Recording</td>
<td>(XXX)</td>
</tr>
<tr>
<td>Add – Held on behalf of customer</td>
<td>XXX</td>
</tr>
<tr>
<td>Physical Balance</td>
<td>XXX</td>
</tr>
</tbody>
</table>
EXAM RUBRIC:

<table>
<thead>
<tr>
<th>Sales</th>
<th>Rs. '000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Actual:</strong></td>
<td></td>
</tr>
<tr>
<td>January 2012</td>
<td>85000</td>
</tr>
<tr>
<td>February 2012</td>
<td>95000</td>
</tr>
<tr>
<td><strong>Forecast:</strong></td>
<td></td>
</tr>
<tr>
<td>March 2012</td>
<td>55000</td>
</tr>
<tr>
<td>April 2012</td>
<td>60000</td>
</tr>
<tr>
<td>May 2012</td>
<td>65000</td>
</tr>
<tr>
<td>June 2012</td>
<td>75000</td>
</tr>
</tbody>
</table>

60% of the debtors are collected in the first month subsequent to sale whereas the remaining debtors are collected in the second month following sales.

ACCOUNTING TREATMENT:

Terms meanings:

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Now</td>
<td>Current Period</td>
</tr>
<tr>
<td>First Month</td>
<td>Next Month</td>
</tr>
<tr>
<td>2nd Month</td>
<td>Subsequent Next Month</td>
</tr>
</tbody>
</table>

Sales will be calculated as follows:

<table>
<thead>
<tr>
<th></th>
<th>March</th>
<th>April</th>
<th>May</th>
</tr>
</thead>
<tbody>
<tr>
<td>January (85000*80%*40%)</td>
<td>27200</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>February (95000*80%*60%)</td>
<td>45600</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>February (95000*80%*40%)</td>
<td>-</td>
<td>30400</td>
<td>-</td>
</tr>
<tr>
<td>March (55000*80%*60%)</td>
<td>-</td>
<td>26400</td>
<td>-</td>
</tr>
<tr>
<td>March (55000*80%*40%)</td>
<td>-</td>
<td>-</td>
<td>17600</td>
</tr>
<tr>
<td>April (60000*80%*60%)</td>
<td>-</td>
<td>-</td>
<td>28800</td>
</tr>
<tr>
<td>Cash Sales</td>
<td>11000</td>
<td>12000</td>
<td>13000</td>
</tr>
<tr>
<td><strong>Total Sales</strong></td>
<td>83800</td>
<td>68800</td>
<td>59400</td>
</tr>
</tbody>
</table>

Credit Sales rule is as follows:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>February + March</td>
</tr>
<tr>
<td>February</td>
<td>March + April</td>
</tr>
<tr>
<td>March</td>
<td>April + May</td>
</tr>
<tr>
<td>April</td>
<td>May + June</td>
</tr>
</tbody>
</table>
EXAM RUBRIC: ZL earns a gross profit of 25% of sales and uniformly maintains stocks at 80% of the projected sale of the following month.

ACCOUNTING TREATMENT:

GP = Sale – CGS
25% = 100% - 75%
GP = 55000/100*25 = 13750

February = CGS = 95000/100 *75 = 71250
March = CGS = 55000/100 *75 = 41250
April = CGS = 60000/100 *75 = 45000
May = CGS = 65000/100 *75 = 48750

Opening Stock (80% of CGS) + Purchase – Closing Stock = CGS
February = 57000 + P – 33000 = 71250
March = 33000 + P – 36000 = 41250
April = 36000 + P – 39000 = 45000
May = 39000 + P – 45000 = 48750

Rule:
- Opening Stock = current year CGS
- Closing Stock = Next / Projected year CGS

Purchases will be calculated as follows:
- February = 47250
- March = 44250
- April = 48000
- May = 54750