دنیا کے بڑے بڑے عظیم الشان کامیابیوں کی کنجی صرف دعا ہے۔

STUDY NOTES FOR COST ACCOUNTING

BY

ATAUSH SHAFI

Last Updated on: Tuesday, January 01, 2013

© For Suggestions & Feedbacks, contact: ATAUSH SHAFI (ataushshafi@gmail.com)

Table of Contents

CIMA OFFICIAL TERMINOLOGY 3
COST OF GOODS SOLD FORMULE 13
COST CLASSIFICATION 17
PROCESS COSTING 18
BY-PRODUCT 30
DECISION MAKING 35
BUDGETING 66
STANDARD COSTING 76
MATERIAL COSTING 100
FACTORY OVERHEAD 112
BREAK EVEN ANALYSIS 117
ABSORPTION/MARGINAL COSTING 128
LABOR 134
COST CYCLE 139
JOB ORDER COSTING 148
PAST PAPERS 150
IMPORTANT POINTS IN EACH PAST PAPERS 169
EXAM RUBRIC 173

CIMA OFFICIAL TERMINOLOGY

Terms	Definitions
Cost accounting	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.
Cost object	A product, service, centre, activity, customer or distribution channel in relation to which costs are ascertained.
Cost unit	Unit of product or service in relation to which costs are ascertained. • As a noun, **cost** is 'The amount of cash or cash equivalent paid …. • As a verb, cost is 'To ascertain the cost of a specified thing or activity. • The word *cost* can rarely stand alone and should be qualified as to its nature and limitations. ***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 جس Product کی costing کرتے ہیں، اس کو cost unit کہتے ہیں۔
Cost Center	جہاں پر cost unit پر کام ہو رہا ہے۔ ***Type of cost centre*** — ***Examples*** Service location — Stores, canteen Function — Sales representative Activity — Quality control Item of equipment — Packing machine
Cost classification	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.
Direct cost	Expenditure that can be attributed to a specific cost unit, for example material that forms part of a product.
Prime cost	Total of direct material, direct labor and direct expenses.

© For Suggestions & Feedbacks, contact: ATAUSH SHAFI (ataushshafi@gmail.com)

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. ***20X1*** ***20X2*** Fixed cost (Rs) 50,000 50,000 No of units produced 500 1,000 (Units have increased) Fixed cost per unit (Rs: 50,000/no. of units) 100 50 (Cost per unit has decreased) 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**. <u>Example: Deprival value of an asset</u> 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? <u>Solution</u> 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. **LOWER OF** REPLACEMENT COST (Rs: 9,000) — HIGHER OF (Rs: 10,000) NRV (Rs: 8,000) — EXPECTED REVENUES (Rs: 10,000) 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.
LIFO (last in, first out)	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.
Average cost	Used to price issues of goods or materials at the weighted average cost of all units held.
Cost-volume-profit analysis (CVP	Study of the effects on future profit of changes in fixed cost, variable cost, sales price, quantity and mix.
Breakeven point	Level of activity at which there is neither profit nor loss.
C/S ratio (P/V ratio)	A measure of how much contribution is earned from each Rs: 1 of sales.
Margin of safety	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.**
Limiting factor or key factor	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**.
Standard cost	Planned unit cost of a product, component or service.
Standard costing	Control technique that reports variances by comparing actual costs to pre-set standards so facilitating action through management by exception.
Management by exception	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
Performance standard	**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

	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.
Variance	The difference between a planned, budgeted, or standard cost and the actual cost incurred. The same comparisons may be made for revenues.
Direct material total variance	Measurement of the difference between the standard material cost of the output produced and the actual material cost incurred.
Direct material price variance	Difference between the actual prices paid for the purchased materials and their standard cost.
Direct material usage variance	Measures efficiency in the use of material, by comparing standard material usage for actual production with actual material used, the difference is valued at standard cost.
Direct labor total variance	Indicates the difference between the standard direct labor cost of the output which has been produced and the actual direct labor cost incurred.
Direct labor rate variance	Indicates the actual cost of any change from the standard labor rate of remuneration.
Direct labor efficiency variance	Standard labor cost of any change from the standard level of labor efficiency.
Direct labour idle time variance	Occurs when the hours paid exceed the hours worked and there is an extra cost caused by this idle time. Its computation increases the accuracy of the labor efficiency variance.

Variable production overhead total variance	Measures the difference between variable overhead that should be used for actual output and variable production overhead actually used.
Variable production overhead expenditure variance	Indicates the actual cost of any change from the standard rate per hour.
Variable production OVH efficiency variance	Standard variable overhead cost of any change from the standard level of efficiency.
Sales price variance	Change in revenue caused by the actual selling price differing from that budgeted.
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 sal**es volume revenue variance** and it measures the change in sales revenue caused by sales volume 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.

	Budget	*Actual*
Sales units	600	620
Selling price per unit Rs:	30	29

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.
Budget purposes	Budgets 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.
Budget	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.
Budget period	Period for which a budget is prepared, and used, which may then be sub-divided into control periods.
Budget manual	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.
Principal budget factor	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.
Budget flexing	Flexing variable costs from original budgeted levels to the allowances permitted for actual volume achieved while

	maintaining fixed costs at original budget levels.
Integrated accounts	Set of accounting records that integrates both financial & cost accounts using a common input of data for all accounting purposes.
Process costing	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.
Normal loss	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.
Abnormal loss	Any loss in excess of the normal loss allowance.
Abnormal gain	Improvement on the accepted or normal loss associated with a production activity.
Scrap	Discarded material having some value.
Equivalent units	Notional whole units representing incomplete work. Used to apportion costs between work in progress and completed output.
Joint products	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.
By-product	Output of some value produced incidentally while manufacturing the main product.
Job	Customer order or task of relatively short duration.
Job costing	Form of specific order costing where costs are attributed to individual jobs.
Batch costing	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).
Contract costing	Form of specific order costing where costs are attributed to contracts.
Departmental/functional budget	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.
Approaches to budgeting	**1 - Incremental budgeting** The **traditional approach** to budgeting is to **base next year's budget on the current year's results plus an extra amount**

	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 FORMULE

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

© For Suggestions & Feedbacks, contact: ATAUSH SHAFI (ataushshafi@gmail.com)

FORMAT OF COST OF GOODS SOLD STATEMENT

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

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

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

W-3 = Actual FOH XXX

Applied FOH XXX

Under/Over Applied **XXX**

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

NOPU (Negative: Over applied & Positive: Under applied)

Gross Profit = Sales – Cost of Goods Sold (Actual)

PRDBLEMS IN PREPARATIDN DF CDGS STATEMENT

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

Gross Profit Margin Rate	**Gross Profit margin rate = Gross Profit/ Sales x 100** 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%.
Gross Profit Markup Rate	**Gross Profit markup rate = Gross Profit/Cost of goods sold x 100** 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. **In case of Margin** / **In case of Markup** Sales: 100% / 125% Cost of goods sold: 75% / 100% Gross profit: 25% / 25% 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: **Required information =** **given information x %age of required information / %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%
Net Profit Ratio	Net Profit ratio = Net Profit/Sales x 100
Inventory Turnover Ratio	Inventory turnover ratio = Cost of goods sold / Average inventory Average inventory = (Opening Inventory + Closing Inventory) / 2
Inventory Holding Period	Inventory holding period in days = Number of days in a year / Inventory turnover ratio Alternatively = Average inventory x 365 / Cost of goods sold

COST BEHAVIOR - PER UNIT OF PRODUCTION

	Per Unit	Total
Fixed Cost	Increase	Constant
Variable Cost	Constant	Decrease
Total Cost	Increase	Decrease

COST CLASSIFICATION

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

Figure 1.10 Elements of cost

PROCESS COSTING

POINTS	TREATMENTS
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 / Good units **OR** Unit cost after adjustment (Total cost / good units) = XXX Unit cost before adjustment = XXX **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 **E**quivalent **P**roduction **R**eport (**EPR**).
- Cost of Work-In-Process beginning inventory included in "Cost Charged to department". Ignore unit cost.
- **Unit Cost calculation:**

$$\frac{\text{WIP beginning inventory cost * cost charged by department}}{\text{EPR units}}$$

SECOND & FURTHER DEPARTMENT:

- No change in **E**quivalent **P**roduction **R**eport (**EPR**).
- Cost of WIP beginning inventory included in "Cost Charged to department". Ignore unit cost.
- **Unit Cost calculation:**

$$\frac{\text{WIP beginning inventory cost * cost charged by department}}{\text{EPR units}}$$

- **Cost of preceding department:**

	T.C.	U.C.
Cost of last department	XXX	XXX
Cost of WIP opening inventory	XXX	XXX
	XXX	**XXX**

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 gods 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

Inventory Cost	(As given in the question)
Direct Material	(WIP unit * stage completion % * unit cost)
Direct labor	(WIP unit * stage completion % * unit cost)
Factory Overhead	(WIP unit * stage completion % * unit cost)

FROM CLOSING WIP INVENTORY

Direct Material	(WIP unit * stage completion % * unit cost)
Direct labor	(WIP unit * stage completion % * unit cost)
Factory Overhead	(WIP unit * stage completion % * unit cost)

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:**

Last deptt	XXX (unit loss * unit cost)
Material	XXX (unit loss * unit cost)
Labor	XXX (unit loss * unit cost)
FOH	XXX (unit loss * unit cost)

EQUIVALENT PRODUCTION REPORT

FOR FIFO

	Previous Deptt	Direct Material	Direct Labor	FOH
Transfer	XXX	XXX	XXX	XXX
Opening WIP (Given)	XXX	XXX	XXX	XXX
Abnormal Loss	XXX	XXX	XXX	XXX
Abnormal Gain	(XXX)	(XXX)	(XXX)	(XXX)
Current Production	**XXX**	**XXX**	**XXX**	**XXX**
Opening WIP (1 – % * 100)	XXX	XXX	XXX	XXX
Closing WIP (Given)	XXX	XXX	XXX	XXX
TOTAL UNITS	**XXX**	**XXX**	**XXX**	**XXX**

FOR OTHERS

	Previous Deptt	Direct Material	Direct Labor	FOH
Transfer	XXX	XXX	XXX	XXX
Closing WIP	XXX	XXX	XXX	XXX
Abnormal Loss	XXX	XXX	XXX	XXX
Abnormal Gain	(XXX)	(XXX)	(XXX)	(XXX)
Normal Loss (2nd Deptt)	XXX	XXX	XXX	XXX
Normal Loss at end	XXX	XXX	XXX	XXX
TOTAL UNITS	**XXX**	**XXX**	**XXX**	**XXX**

COST PER UNIT = Total costs/Total equivalent production units

TOTAL COST FOR PERIOD = Value of completed units + 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

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

PROCESS ACCOUNT - BRITISH APPROACH

Particulars	Qty	Amount	Particulars	Qty	Amount
		Rs.			Rs.
Opening Balance	XXX	XXX	Transfer to next deptt	XXX	XXX
Direct Material		XXX	Normal Loss	XXX	XXX
Direct Labor		XXX	Abnormal Loss	XXX	XXX
Factory Overhead		XXX			
Additional Overhead		XXX			
Direct Expenses		XXX			
FOH Allocated		XXX			
Abnormal Gain	XXX	XXX			
TOTAL		**XXX**	**TOTAL**		**XXX**

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**

Points	Normal Loss	Abnormal Loss
Nature	Unavoidable	Avoidable
Existence	Inherent	Non- Inherent
Factors	1. Shrinkage 2. evaporation 3. spoilage	1. Unforeseen factors 2. Abnormal conditions like: • Maladministration • Bad design • Negligence on part of labor
Inclusion	Credited to process account	Credited to process account

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?**

Total Units	XXX
Normal Loss	(XXX)
Transfer	(XXX)
Abnormal Loss/ Gain	**XXX**
DECISION RULE	
Positive	**Abnormal Loss**
Negative	**Abnormal Gain**

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**:

Normal Loss at the end	100% completed units
Abnormal Loss	100% completed units
Abnormal Gain	100% completed units

12. Accounting for Scrap Values:

Normal Loss	Credited to process account
Abnormal Loss	Credited to abnormal loss account. Process account is credited with per unit cost only.
Abnormal Gain	Debited to abnormal loss account. Process account is debited with per unit cost only.

13. Formula to determine Abnormal Loss/ Gain:

STEP # 01	
Total Input	XXX
Expected Output	(XXX)
Normal Loss	**XXX**
STEP # 02	
Actual Loss	XXX
Normal Loss	(XXX)
Abnormal Loss	**XXX**
DECISION RULE	
Positive	**Abnormal Loss**
Negative	**Abnormal Gain**

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.

Particulars	Qty	Amount	Particulars	Qty	Amount
		Rs.			Rs.
Process Account	XXX	XXX	Scrap Account (units * scrap value)	XXX	XXX
			Profit & Loss Account	XXX	XXX
TOTAL		**XXX**	**TOTAL**		**XXX**

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.

Particulars	Qty	Amount	Particulars	Qty	Amount
		Rs.			Rs.
Scrap Account (units * scrap value)	XXX	XXX	Process Account	XXX	XXX
Profit & Loss Account	XXX	XXX			
TOTAL		**XXX**	**TOTAL**		**XXX**

COST OF PRODUCTION REPORT - AMERICAN APPROACH

QUANTITY SCHEDULE:		
Units Started/put into process	XXX	
Units added	XXX	
Units received from last deptt	XXX	**XXX**
Units transferred to next deptt	XXX	
Units Completed in deptt	XXX	
Abnormal Loss	XXX	
Normal loss at the end	XXX	**XXX**
COST CHARGED BY THE DEPTT:		
Cost of preceding deptt:	**Total Cost**	**Unit Cost**
Cost of WIP Opening inventory (Open WIP Units : XXX)		
Cost of previous deptt (Last deptt Units : XXX)		
(Total Units : XXX)		XXX (W-1)
Cost added by the deptt:		
Cost added during month:		
Direct Material	XXX	XXX
Direct Labor	XXX	XXX
Factory Overhead	XXX	XXX
Cost of Opening WIP:		
Direct Material	XXX	XXX
Direct Labor	XXX	XXX
Factory Overhead	XXX	XXX
Total Cost Added by the deptt	XXX	XXX
Adjustment of normal loss units	XXX	XXX
Total Cost To Be Accounted For	**XXX**	**XXX**
TOTAL COST ACCOUNTED FOR AS FOLLOWS:		
Cost of goods transferred		XXX
Cost of preceding deptt/Adjusted Cost of last deptt		XXX
Closing WIP:		
Direct Material	XXX	
Direct Labor	XXX	
Factory Overhead	XXX	XXX
Total Cost Accounted For		**XXX**

Notes:

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

Start	During	End
Not included in EPR	Not included in EPR	Included in EPR

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)

$$\frac{\text{Unit loss * unit cost of last deptt}}{\text{Good Units}}$$

6. Cost Per Unit:

$$\frac{\text{Total cost – Normal Loss scrap value}}{\text{EPR units}}$$

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

Normal Loss at the end	Inspection %
Abnormal Loss	Inspection %
Abnormal Gain	Inspection %

© For Suggestions & Feedbacks, contact: ATAUSH SHAFI (ataushshafi@gmail.com)

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.

BY PRODUCT CHART:

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:

$$\frac{\text{Total cost – scrap value of normal loss – NRV of by-product produced}}{\text{Equivalent units – By-product}}$$

ALLOCATION OF JOINT COSTS

MARKET VALUE/ SALE VALUE METHOD

$$\frac{\text{Total joint product cost}}{\text{Total market cost}} * 100$$

= Answer * each market value = 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

$$\frac{\text{Total joint product cost}}{\text{Total number of unit produced}} * 100$$

= Answer * quantity produce = apportionment of joint cost

WEIGHTED AVERAGE METHOD

$$\frac{\text{Total joint product cost}}{\text{Total number of unit weight}} * 100$$

= Answer * individual weight = 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:

DIFFERENCE	JOINT PRODUCT	BY PRODUCT
SALE VALUE	High	Low
FURTHER PROCESS	After spit off point	Not economical
ACCOUNTING	Allocate on various bases	Many Methods
INTENTION TO PRODUCE	Intentionally	No intention

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:

Demand * Per Unit scarce Hour	XXX
Less- Available hour	XXX
Shortfall (if positive)	**XXX**

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.

OPTIMUM PLAN:

Demand * Contribution Margin per Unit	XXX
Demand * Contribution Margin per Unit	XXX
Demand * Contribution Margin per Unit	XXX
TOTAL CONTRIBUTION	**XXX**

NOTE: Unit contribution is not the correct way to decide priorities.

© For Suggestions & Feedbacks, contact: ATAUSH SHAFI (ataushshafi@gmail.com)

MORE THAN TWO PRODUCTS

DETERMINING LIMITING FACTOR / RESOURCE:

Demand * Per Unit scarce Hour	XXX
Less- Available hour	XXX
Shortfall (if positive)	**XXX**

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:

Demand * Scarce Hour	XXX
Demand * Scarce Hour	XXX
Demand * Scarce Hour	XXX
TOTAL CONTRIBUTION	**XXX**

MINIMUM DEMAND GIVEN

DETERMINING LIMITING FACTOR / RESOURCE:

Demand * Per Unit scarce Hour	XXX
Less- Available hour	XXX
Shortfall (if positive)	**XXX**

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:

Demand * Scarce Hour	XXX
Demand * Scarce Hour	XXX
Demand * Scarce Hour	XXX
TOTAL CONTRIBUTION	**XXX**
Total Demand -- Minimum Demand * Scarce Hour	XXX
Total Demand -- Minimum Demand * Scarce Hour	XXX
Total Demand -- Minimum Demand * Scarce Hour	XXX
TOTAL CONTRIBUTION	**XXX**

HOW MUCH TO BUY -- FORMAT

Available Mix	XXX
A – (Demand * Limiting factor)	(XXX)
	XXX
B – (Demand * Limiting factor)	(XXX)
	XXX
C – (Demand * Limiting factor)	(XXX)
Balance	**XXX**
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	(XXX)
Units Bought	**XXX**

ILLUSTRATION TO ABOVE FORMULA:

	Pentagon	Hexagon	Octagon
Machine time per unit (Hours) – Limiting factor	4	2.5	3
Ranking	3rd	2nd	1st
Estimated demand (Units)	10000	20000	9000
Available Hours		100000	

SOLUTION TO ABOVE FORMULA:

Available Mix	100000
A – (9000 * 3)	(27000)
	73000
B – (20000 * 2.5)	(50000)
	23000
C – (5750 * 4)	(23000)
Balance	**NIL**
In above case, we divide 23000 hrs (Balance of B) to 4 (limiting factor) to get 5750 hrs, unit bought will be as follows:	
Total Demand of C	10000
Demand of C	(5750)
Units Bought	**4250**

RELEVANT COST

1. Five Vital **Criteria**:

   a. Bearing on the future. (**Relate, incur & تعلق** with future). 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.
3. Opportunity Cost.
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.
9. Actual Overhead.
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:

Particulars	Do not re-arrange	Re-arrange
	Rs.	Rs.
Direct materials cost/unit	10.00	10.00
Direct labour cost/unit	5.00	4.00

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 offi ce 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.

Revenue			XXX
Less-	Cost	XXX	
	Savings	XXX	
	Avoidable cost	XXX	(XXX)
			XXX

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:

Variable manufacturing cost	XXX
Add-- Opportunity Cost	XXX
Less—Savings	XXX
TOTAL	**XXX**

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

No Limiting Factor	High CM ratio is good.
Limiting Factor	High contribution per scarce resource is good.

INCREMENTAL ANALYSIS

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

Expected C/M (Expected sale * C/M ratio)	XXX
Previous C/M (Old sale * C/M ratio)	XXX
Increased C/M	XXX
Less- Additional Sales	XXX
Increased Net Operating Income	**XXX**

© For Suggestions & Feedbacks, contact: ATAUSH SHAFI (ataushshafi@gmail.com)

DECISION MAKING MODEL

SAME C/M PER LIMITING FACTOR

SALES	A	B	C
CM (Per limiting factor)	48	40	40
Ranking	**1**	**2**	**2**

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

اس کی وجہ سے ہمیں کہیں اور جو Gain ہوگا، اسے **Opportunity Gain** کہتے ہیں۔

اس کی وجہ سے ہمیں کہیں اور جو Loss ہوگا، اسے **Opportunity Loss** کہتے ہیں۔

CONCEPTS

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

	A	B	TOTAL
Qty	100	300	400
VC Per unit	3	3	3
Total VC	**300**	**900**	**1200**

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

	A	B	TOTAL
Qty	200	200	400
VC Per unit	2	3	
Total VC	**400**	**600**	**1000**

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

	A	B	TOTAL
Qty	300	500	800
VC Per unit	1	4	
Total VC	**300**	**2000**	**2300**

WHEN TO USE WEIGHTED AVERGAE 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:

Total Variable Cost	836000		
VC Ratio	1	1.5	1.75
Units	15000	10000	10000

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:

	Pre	Post	Total
Sales	300000	900000	1200000
COGS	(216216)	(583783)	(800000)
Gross Profit	**83784**	**316217**	**400000**
Gross Profit (%)	27.93%	35.13%	

Working: Weighted average is calculated as follows-

Qty	3	9
VC	1	0.9 (1-10%)
	3	**8.1**

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**

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 fixe costs expenditure.

4. LABOR - 1

LABOR - 2

5. MATERIAL

RAW MATERIAL ALREADY PURCHASED

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

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

CRITERIA:

1 – Required is more.

2 – Available is less.

3 – Regular uses

→

Required Unit = XXX

Available Unit = (XXX) * current replacement price

Balance = **XXX** * current replacement price

CASE # 02

CRITERIA:

1 – Required is more.

2 – Available is less.

3 – Non - Regular uses

→

Required Unit = XXX

Available Unit = (XXX) * disposal cost

Balance = **XXX** * current replacement price

CASE # 03

CRITERIA:

1 – Required is less.

2 – Available is High.

3 – Regular uses

→

Required Unit * current replacement price

CASE # 04

CRITERIA:

1 – Required is less.

2 – Available is high.

3 – Non - Regular uses

→

Required Unit = XXX * disposal cost

CASE # 05

CRITERIA:

Required = Available.

→

Required Unit = XXX

OR

Available Unit = XXX * 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

© For Suggestions & Feedbacks, contact: ATAUSH SHAFI (ataushshafi@gmail.com)

- 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

	Differential Costing	Incremental Costing
Definition	Alternative course of action	Change in FC due to increase or decrease in output
Approach	Absorption / Marginal costing	Contribution
Yard Stick	Increase or Decrease in revenue	Contribution Margin
Help	Managerial & non accounting decisions	All decisions. Both accounting & non accounting
Fixed Cost	FC is not added	FC is added

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
		5kg 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

Material =		
	1000 * 5	5000
A :	600 * 5	3000
B :	400 * 9	3600
Labor =		
Skilled	(85 * 5)	425
Semi Skilled	(100 * 6.67)	667
Working – 5 +5 *1/3 = 1.67 <5 +1.67 = 6.67>		
Variable Overhead :		
Skilled	(85*4)	340
Semi Skilled	(100*4)	400
Machine =		
Outflow	3000	
Inflow	(2500)	500
Outflow	4000 (3000+1000)	
Inflow	(3700)	300
TOTAL		**14232**

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 ahs 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:

Material:	
A : 2000 kg @ Rs: 10 per kg	20000
B : 1000 kg @ Rs: 15 per kg	15000
C : 500 kg @ Rs: 40 per kg	20000
D : 50 liter @ Rs: 12 per liter	600
Labor:	
Skilled : 1000 hrs @ Rs: 25 per hr	25000
Semi - Skilled : 2000 hrs @ Rs: 15 per hr	30000
Un Skilled : 500 hrs @ Rs: 10 per hr	5000
Fixed overhead : 3500 hrs @ Rs: 12 per hr	42000
Costs of preparing the tender :	
Mr. Bill Gates time	1000
Other expenses	500
Minimum profit (5% of total costs)	7725
Minimum tender price	**166825**

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 ahs 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

Material:	
A : 1000 kg @ Rs: 10 per kg	10000
1000*2 = 2000 – 300 = 1700 <Working – Rs: 300 are opportunity savings>	1700
B : 1000 kg @ Rs: 15 per kg	15000
C : Higher of Rs: 6000/- OR Rs: 8000/-	8000
D : (50 * 50) < opportunity savings>	(2500)
Labor:	
Skilled : 1000 hrs @ Rs: 25 per hr	25000
Semi - Skilled : Required = 2000 Available = (1500) Shortfall = 500 (500 * 22.50) Working – overtime of Rs: 22.50 (15+50%) will always be paid at premium.	11250
Un Skilled : (500 * 2 = 1000) & (10 * 500 = 5000) = (1000+5000 = 6000)	6000
Minimum Tender Price	**74450**

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 ahs 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:

Material:	
A : 5 kg @ Rs: 100 per kg	500
B : 10 kg @ Rs: 150 per kg	1500
C : 10 kg @ Rs: 75 per kg	750
D : 7 kg @ Rs: 10 per kg	700
Labor:	
Skilled : 100 hrs @ Rs: 10 per hr	1000
Semi - Skilled : 75 hrs @ Rs: 7 per hr	525
Un Skilled : 80 hrs @ Rs: 5 per hr	400
Variable overhead : 255 hrs @ Rs: 3 per hr	765
Fixed overhead : 255 hrs @ Rs: 2 per hr	510
Costs of preparing the statement	100
Minimum tender price	**6750**

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

Material:	
A : higher of Rs: 120/- OR Rs: 130/- = 130*5	650
B : higher of Rs: 200/- OR Rs: 160/- = 200*10	2000
C : (4*100 = 400) & (6 * 75 = 450) : <400+450=950>	950
D	0
Labor:	
Skilled : (25*10)	250
Semi - Skilled : (75*6 = 400 & 75*7=525) Working – lower of Rs: 1500 (75*20=1500) OR Rs: 975	975
Un Skilled : (80*5)	400
Variable overhead (225*3)	765
Rent of workshop for modification work	100
Cash proceeds	4000
Hire of special machine	200
Minimum Tender Price	**10290**

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

			Model - 1	Model – 2
			Rs:	Rs:
Selling price			5.00	7.50
Materials	1.25	1.63		
Labour	1.50	2.25	(2.75)	(3.88)
Contribution			2.25	3.62
÷			÷	÷
Limiting Factor			0.25	0.375
Contribution per direct labour hour			**9.00**	**9.65**

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

			Rs:
Materials			1,000
Labour	(Rs: 6 *150 hours)	900	
Opportunity cost	(150 hours * Rs: 9.00)	1,350	
			3,250

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

		Rs:
Sales revenue		35,000
Materials	9,000	
Component	2,500	
Labour (Rs: 6 * 1,200)	7,200	(18,700)
Contribution		16,300
Contribution per direct labour hour		**13.58**

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:

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

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:

Product	*W*	*X*	*Y*	*Z*	*Total*
	Rs:	**Rs:**	**Rs:**	**Rs:**	**Rs:**
Variable costs	4,800	1,600	13,200	5,000	24,600
Fixed costs	11,200	6,400	8,800	5,000	31,400
Total	**16,000**	**8,000**	**22,000**	**10,000**	**56,000**

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.

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

*Total overhead less Rs: 5,000 fixed cost

Workings

1.

Product	*W*	*X*	*Y*	*Z*	*Total*
	Rs:	**Rs:**	**Rs:**	**Rs:**	**Rs:**
Fixed costs	11,200	6,400	8,800	5,000	31,400
Non-specific fixed cost*	6,000	4,000	7,000	3,000	20,000
Specific fixed costs	5,200	2,400	1,800	2,000	11,400

*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

		Rs:
Contribution from 40% additional sales of Y	(Rs: 18,300 * 0.4)	7,320
Additional specific fixed costs (Rs: 1,800 * 0.3)		(540)
Loss of net benefit from Z		(6,500)
Net gain		**280**

(ii) Profit reconciliation

	Rs:
Existing profit	6,000
Discontinuation of Z	(6,500)
Additional contribution from Y	7,320
Additional specific fixed costs	(540)
Profit if Z is discontinued and sales of Y substituted	**6,280**

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

BUDGET	FORECAST
Relate to planned event.	**Concern with probable event.**
Comprise whole business unit.	**Cover limited function.**
Planned separately for each account period.	**Cover long period.**
Tool of control.	**Not a tool for control.**
Budget starts when forecast ends & convert it into budget.	**Forecast end with forecast of likely event.**

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.

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

SHORT TERM:

Period	It is prepared for less than 12 months.
Useful For	• Lower management level. • Control purposes. e.g.

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

Budgeted Unit Sold	XXX
Add- Ending Inventory of Finished Goods	XXX
Total needs	XXX
Less- Beginning Inventory of Finished Goods	XXX
Required production/Units to be produced	**XXX**

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.

Raw Material needed to meet the production schedule	XXX
Add- Ending Inventory of raw material	XXX
Total Raw Material needs	XXX
Less- Beginning Inventory of raw material	XXX
Raw Material to be production	**XXX**

SALES BUDGET

Sale in units	XXX
Sale price per unit	XXX
Total Price	**XXX**

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.
6. Expected action of competitors.
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.

Required Production (from production budget)	XXX
Direct labor hour	XXX
Total direct labor hour needs	XXX
Direct labor cost per hour	XXX
Total direct labor cost	**XXX**

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.

Direct Material	XXX
Direct labor	XXX
Variable Overhead	XXX
Fixed Overhead	XXX
Total Overhead cost	**XXX**

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.

Flexed 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

Opening Cash balance	**XXX**	**YYY**	**ZZZ**
Add- Receipts from debtors	XXX	YYY	ZZZ
Add- Sales of Capital items	XXX	YYY	ZZZ
Add- Any loan received	XXX	YYY	ZZZ
Add- Proceed for share issues	XXX	YYY	ZZZ
Add- Any other cash receipts	XXX	YYY	ZZZ
= Total Cash Available	**XXX**	**YYY**	**ZZZ**
Less- Payments to creditors	XXX	YYY	ZZZ
Less- Cash purchases	XXX	YYY	ZZZ

Less- Wages & salaries	XXX	YYY	ZZZ
Less- Loan Repayments	XXX	YYY	ZZZ
Less- Capital expenditure	XXX	YYY	ZZZ
Less- Dividends	XXX	YYY	ZZZ
Less- Taxation	XXX	YYY	ZZZ
Less- Any other cash disbursements	XXX	YYY	ZZZ
= Closing Cash Balance	**XXX**	**YYY**	**ZZZ**
Desired Balance	XXX	YYY	ZZZ
Cash Balance before Borrowing	**XXX**	**YYY**	**ZZZ**
Add- Borrowings	XXX	YYY	ZZZ
Less- Repayments	XXX	YYY	ZZZ
Less- Interest Payments	XXX	YYY	ZZZ
Cash Balance after Borrowing	**XXX**	**YYY**	**ZZZ**

Closing Balance	XXX
Desired Level	XXX
	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

Budgeted Cash Flow	**XXX**
Add – Payments appearing in cash budget but never appearing in P & L account	XXX
Add – Receipts appearing in the P & L account but never appearing in the cash budget	XXX
Less – Charges appearing in the P & L account but never appearing in the cash budget	XXX
Less - Receipts appearing in the cash budget but never appearing in the P & L account	XXX
Add – Sales/receipts adjustment	XXX
Less – Purchases/payments adjustment	XXX
Less – Expenses/Payments adjustment	XXX
Budgeted Profit	**XXX**

BUDGETARY CONTROL ANALYSIS

	Fixed Budget	Flexible Budget	Actual budget	Budget Variances
Production & Sales (Units)	XXX	XXX	XXX	XXX
Sales	XXX	XXX	XXX	XXX
Variable Costs	XXX	XXX	XXX	XXX
DM	XXX	XXX	XXX	XXX
DL	XXX	XXX	XXX	XXX
V/FOH	XXX	XXX	XXX	XXX
Semi – Variable Costs	XXX	XXX	XXX	XXX
Fixed Costs	XXX	XXX	XXX	XXX
Total costs	XXX	XXX	XXX	XXX
Profit	**XXX**	**XXX**	**XXX**	**XXX**

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.

Budget cost allowance = budgeted fixed cost* + (number of units × 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.
5. Benchmark for measuring performance.

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

نوٹ: کتنی cost لگنی چاہیے تھی Actual Production کے لیئے۔

COMPARISONS:

Standard will be compared to **Actual**
Standard will NOT be compared to **Budgeted**
Budgeted will be compared to **Budgeted**
Actual will NOT be compared to **Actual**

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

STANDARD COST	BUDGETED COST
Unit Amount	Total Amount
Part of double entry system	Not part of double entry system
Controlling cost	Planning cost
Estimate of actual capacity	Estimate of normal capacity
Cost expectation of per unit of activity	Cost expectation of total unit of activity

© For Suggestions & Feedbacks, contact: ATAUSH SHAFI (ataushshafi@gmail.com)

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	XXX
Budgeted FOH for Capacity Attained	XXX
	XXX

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

DECISION RULE:	
Actual High	**Adverse**
Actual Low	**Favorable**

VOLUME VARIANCE:

Budgeted FOH for Capacity Attained	XXX
Applied FOH	XXX
	XXX

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

DECISION RULE:	
Budgeted High	**Adverse**
Budgeted Low	**Favorable**

THREE VARIANCE

CAPACITY VARIANCE:

Applied FOH	XXX
Budgeted FOH for Capacity Attained	XXX
	XXX

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

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

DECISION RULE	
Budgeted High	**Adverse**
Budgeted Low	**Favorable**

SPENDING / EXPENDITURE VARIANCE:

Budgeted FOH for Capacity Attained	XXX
Actual FOH	XXX
	XXX

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

DECISION RULE	
Actual High	**Adverse**
Actual Low	**Favorable**

EFFICIENCY VARIANCE:

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

DECISION RULE	
Actual High	**Adverse**
Actual Low	**Favorable**

FOUR VARIANCE

CAPACITY VARIANCE:

Applied FOH	XXX
Budgeted FOH for Capacity Attained	XXX
	XXX

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

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

DECISION RULE	
Budgeted High	**Adverse**
Budgeted Low	**Favorable**

SPENDING / EXPENDITURE VARIANCE:

Budgeted FOH for Capacity Attained	XXX
Actual FOH	XXX
	XXX

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

DECISION RULE	
Actual High	**Adverse**
Actual Low	**Favorable**

FIXED EFFICIENCY VARIANCE:

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

DECISION RULE	
Actual High	**Adverse**
Actual Low	**Favorable**

VARIABLE EFFICIENCY VARIANCE:

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

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

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

DECISION RULE	
Budgeted High	**Adverse**
Budgeted Low	**Favorable**

MATERIAL VARIANCES

Total Direct Material Variance

BRITISH	AMERICAN
(Actual Cost – Standard Cost)	(Standard cost of material – Actual cost of Material) **OR** (Standard base on actual output * standard rate) – (Actual usage * Actual rate) Where, Standard base on actual output = unit made * per kg / hr Actual Rate = Cost / hrs

Material Variances are divided into **two** variances:

1. Material Price Variance.
2. Material Quantity/Usage Variance.

Direct Material Price Variance

BRITISH	Actual Qty (AR – SR) **OR** Actual Cost – (Actual Qty * SR) **OR** (AQ * AR) – (AQ * SR)
AMERICAN	Actual Qty (SR – AR)

Direct Material Usage Variance

BRITISH	SR (Actual Qty – SQA) < Standard Qty Allowed >
AMERICAN	Standard rate (Standard based on actual output – Actual usage) Where, 1. Standard base on actual output = unit made * per kg / hr 2. Actual Rate = Cost / hrs

Total Material Variance: Material Price Variance + Material Usage Variance

PRICE VARIANCE VARIATIONS

1 - PURCHASE QUANTITY

Raw Material

Purchase (AQ * AR)	Price Variance	AQ (AR-SR)
	Qty Variance	SR (AQ -SQA)
	WIP	(SQA * SR)
	Closing Stock	(Actual Qty – Qty Consumed) * SR

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

Total Direct Material Variance

BRITISH	(Actual Cost – Standard Cost) SC = SQA * SR AC = 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 >

2 - CONSUME QUANTITY

Raw Material

Purchase (AQ * AR)	Price Variance CQ (AR-SR)
	Qty Variance SR (AQ -SQA)
	WIP (SQA * SR)
	Closing Stock (Actual Qty – Qty Consumed) * AR

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

Total Direct Material Variance

BRITISH	(Actual Cost – Standard Cost) SC = SQA * 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
Standard Cost	Material Purchased
Actual Cost	Material Used

DIFFERENCE BETWEEN TWO METHODS

PURCHASE QTY	CONSUME QTY
Period Cost	Product Cost
Not considered for stock valuation	Considered for stock valuation
Cost charge in period in which it is incurred	Cost charge in period in which it is sold

WHICH METHOD TO USE

PURCHASE QTY	CONSUME QTY
Closing stock is valued at SR	Closing stock is valued at AR
Variance is considered as period cost	Variance is considered as product cost
Variance is recorded at earliest stage	--

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

LABOR VARIANCES

Total Direct Labor Variance

BRITISH	(Actual Cost – Standard Cost)
AMERICAN	(Standard cost of Labor – Actual cost of Labor) OR (Standard base on actual hour * standard rate) – (Actual hour * Actual rate) Where, 1. Standard base on actual hour = unit hour * per kg / hr 2. Actual Rate = Cost / hrs

Direct Labor Rate Variance

BRITISH	Actual Hr (AR – SR) **OR** Actual Cost – (Actual Hr * SR)
AMERICAN	**Actual Hr (SR – AR)** Actual hour & productive hour is same thing. Productive hour = Actual hour – Idle hour

Direct Labor Efficiency Variance

BRITISH	**SR (Actual Hr – SHA)** < Standard Hr Allowed > (Actual Yield * Standard time per unit)
AMERICAN	**Standard rate (Standard based on actual hr – Actual hr)** Where, Standard base on actual hr = unit hr * per kg / hr Actual Rate = Cost / hrs

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

FIXED FOH VARIANCE

GROSS PROFIT ANALYSIS

	Budgeted	Actual
Sales Units	10000	9800
Sales Per Unit	10	10.8
Cost Per Unit	9	8.6
Sales	100000	105840
Cost of Sales	(80000)	(84280)
Gross Profit	**20000**	**21560**

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

Standard Quantity Allowed	Raw Material
Budgeted Quantity	Finished Goods

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

Gross Profit Difference	21560 – 20000 = 1560 (A)
Sales	105840 – 100000 = 5840 (F)
CGS	84280 – 80000 = 4280 (A)
Sale Price	9800(10.8-10) = 7840 (F)
Sale Quantity	10(9800-10000) = 2000 (A)
CGS Price	9800(8.6-8) = 5880 (A)
CGS Quantity	8(9800-10000) = 1600 (F)

TWO OR MORE MIX CASES

Cost Volume + Sales Volume = Net Volume / Sales Margin	
SR of Gross Profit (AQ - BQ)	2(9800-10000) = 4000 (A)
SR of Gross Profit (AQ at Actual Mix - BQ)	

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

Production Volume Ratio	SFR(BH-SHA) → SHA/BH * 100
Production Capacity Ratio	SFR(BH-AH) → AH/BH * 100
Productivity/Efficiency Ratio	SFR(AH-SHA) → SHA /AH * 100
DECISION RULE	
Efficient	Greater than 100%
In-efficient	Less than 100%

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)

DM Total Cost Variance (Actual Cost – Standard Cost)	
PRICE VARIANCE	**USAGE VARIANCE**
AQ (AR –SR)	SR (AQ at Actual Mix – SQA)
AC – (AQ * SR)	(AQ*SR) – (SQA*SR)
(AQ*AR) – (AQ*SR)	
Usage Variance is divided into Mix & Yield Variance	
MIX VARIANCE	**YIELD VARIANCE**
SR (AQ at Actual Mix – AQ at Standard Mix)	SR (AQ at Standard Mix – SQA)
(AQ*SR) - (Total AQ*Weighted Per Unit Cost)	

نوٹ: اگر Quantity دیا ہوا ہے Standard Mix میں تو Weighted Average

cost per unit استعمال کیا جا سکتا ہے۔

Raw Material	Kg	Rate Per Kg	Cost
A	12	5	60
B	8	12.5	100
	20	**8 (160/20)**	160

- 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

Material Price Variance	(AQ*AM*AR) – (AQ*AM*SR)
Material Mix Variance	(AQ*AM*SR) – (AQ*SM*SR)
Material Yield Variance	(AQ*SM*SR) – (SQ*SM*SR)

SQ*SM IS CALCULATED AS FOLLOWS:

S.No	Cases	Formulae
1	Unit Produce is given	Unit produce * Total Actual Qty / Total Actual Qty – Loss
2	Unit Produce is not given	Total Actual Qty/ Total Standard Qty * Total Standard – Loss

MATERIAL YIELD VARIANCE CAN ALSO BE CALCULATED AS FOLLOWS:

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

- Actual Yield = Total Units – Loss Units
- SR = $\frac{\text{Total Cost – Normal Loss scrap value}}{\text{Total Units – Normal Loss units}}$

O/S + PURCHASES - C/S IS GIVEN

Material Price Variance	Purchases will be actual quantity
Material Mix Variance	Actual Consumption will be actual quantity
Material Yield Variance	Actual Consumption / Total Standard Qty * Total Standard – Loss

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

© For Suggestions & Feedbacks, contact: ATAUSH SHAFI (ataushshafi@gmail.com)

WASTAGES

1. Normal Loss is not inefficiency.
2. Variance is due to Abnormal Loss.
3. AQ = 8100 & SQA = 9000 & AQ of DM = 9070. So, 9070-8000 = 970 (Normal Loss: 900 & Abnormal Loss: 70)
4. Loss to be adjusted in SQA as follows: Actual Qty * 100% / 100% -Normal Loss %

DL Total Cost Variance (Actual Cost – Standard Cost)	
RATE VARIANCE	**EFFICIENCY VARIANCE**
AH (AR –SR)	SR (AH at Actual Mix – SQA)
AC – (AH * SR)	(AH*SR) – (SHA*SR)
(AH*AR) – (AH*SR)	
Efficiency Variance is divided into Mix & Yield Variance	
MIX VARIANCE	**YIELD VARIANCE**
SR (AH at Actual Mix – AH at Standard Mix)	SR (AH at Standard Mix – SHA)

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)	
IDLE TIME VARIANCE	**REAL EFFICIENCY VARIANCE**
SR (AH Paid – AH worked)	SR (AH worked – SHA)
DL EFFICIENCY VARIANCE SR (AH – SHA)	
REAL EFFICIENCY VARIANCE	**YIELD VARIANCE**
SR (AH –SHA for Standard Yield)	SR (SHA for Standard Yield – SHA for Actual Yield)

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

Budgeted Profit (budgeted sales * standard profit)				XXX
Sale Volume Variance				XXX
Standard profit on actual sales (actual sales * standard profit)				XXX
Sale price variance				XXX
Profit before cost variance				XXX
Cost Variance:				
		ADV	**FAV**	
Materials	– Price	XXX	XXX	
	- Usage	XXX	XXX	
Labor	- Rate	XXX	XXX	
	- Efficiency	XXX	XXX	
Variable Overhead	– Spending	XXX	XXX	
	- Efficiency	XXX	XXX	
Fixed Overhead	– Expenditure	XXX	XXX	
	- Volume	XXX	XXX	
	- Capacity	XXX	XXX	
	- Efficiency	XXX	XXX	XXX
Actual Profit				**XXX**

Standard profit =sales – direct material – direct labor – variable expense – fixed Overhead

RECONCILIATION OF BUDGET & ACTUAL PROFIT - MARGINAL COSTING

Budgeted Profit (budgeted sales * standard contribution)				XXX
Less - Budgeted fixed overhead cost				(XXX)
Budgeted Contribution				XXX
Sale Volume Variance				XXX
Standard Contribution on actual sales (actual sales * standard contribution)				XXX
Sale price variance				XXX
Contribution before cost variance				XXX
Variable Cost Variance:				
		ADV	**FAV**	
Materials	– Price	XXX	XXX	
	- Usage	XXX	XXX	
Labor	- Rate	XXX	XXX	
	- Efficiency	XXX	XXX	
Variable Overhead	– Spending	XXX	XXX	
	- Efficiency	XXX	XXX	
Fixed Overhead	– Budgeted	XXX	XXX	
	- Expenditure	XXX	XXX	XXX
Actual Profit				**XXX**

Standard contribution =sales – direct material – direct labor – variable expense.

COST RECONCILIATION STATEMENT

Standard Cost			**XXX**
Cost Variance:			
	Adv	**Fav**	
	XXX	XXX	
	XXX	XXX	
	XXX	XXX	
	XXX	XXX	XXX
Actual Cost			**XXX**

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

PROFIT RECONCILIATION STATEMENT

Budgeted Profit			**XXX**
Sale Variance:			
	Adv	**Fav**	
	XXX	XXX	
	XXX	XXX	
	XXX	XXX	
	XXX	XXX	XXX
Cost Variance:			
	Adv	**Fav**	
	XXX	XXX	
	XXX	XXX	
	XXX	XXX	
	XXX	XXX	XXX
Actual Cost			**XXX**

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

PROFIT RECONCILIATION STATEMENT (FOR MARGINAL COSTING)

Budgeted Profit			**XXX**
Add- Budgeted Fixed Cost			XXX
Budgeted Contribution			XXX
Sale Variance:			
	Adv	**Fav**	
	XXX	XXX	
	XXX	XXX	
	XXX	XXX	
	XXX	XXX	XXX
Cost Variance:			
	Adv	**Fav**	
	XXX	XXX	
	XXX	XXX	
	XXX	XXX	
	XXX	XXX	XXX
Actual Contribution			**XXX**

Standard Mix = 400

	Weight	SR per kg
A	30	240
B	25	320

Actual Mix = 192

	Weight	AR per kg
A	16	230
B	13	308

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: $\frac{\text{Actual Mix/Production}}{\text{Standard Mix/Production}}$ * Individual Standard quantity

A	$\frac{192}{400}$ * 30	=	14.4	
B	$\frac{192}{400}$ * 25	=	12	

Standard Mix = 1000

	Weight	SR per kg
A	450	20
B	400	40
C	250	60
	1100	
Loss	100	
	1000	

Actual Mix = 20000

	Weight	AR per kg
A	10000	19
B	8500	42
C	4500	65

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

Standard quantity allowed will be calculated as follows:

If Standard Mix/Production = 1000 Then total standard quantity = 1100

If Actual Mix/Production = 20000 Then standard quantity allowed = ?

the formula will be: Actual Mix/Production * Total Standard quantity

Standard Mix/Production LESS any Loss

20000 * 1100 = 22000

1000

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

A	22000 * 450 / 1100 =	9000
B	22000 * 400 / 1100 =	8000
C	22000 * 250 / 1100 =	5000
		22000

Standard Mix = 1900

	Weight	SR per kg	Rs
A	1000	10	10000
B	600	12	7200
C	400	14	5600
	2000		
Loss	100		
	1900		

Actual Mix = **THIS WILL NEVER BE GIVEN IN QUESTION.**

	Opening Stock	Purchases	Closing Stock	Consumption	AR per kg
A	200	1200	300	1100	9.5
B	100	800	200	700	12.5
C	400	700	500	600	14
				2400	

Note that we will take Individual standard cost in this case

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: $\frac{\text{Actual Mix/Production}}{\text{Standard Mix/Production LESS any Loss}}$ * Individual Standard Cost

A $\frac{2400 - 200}{1900}$ * 10000 = 11578

B $\frac{2400 - 200}{1900}$ * 7200 = 8336

C $\frac{2400 - 200}{1900}$ * 5600 = 6484

MATERIAL MIX VARIANCES ILLUSTRATION

Standard Mix = 1000 kg

	Qty	SR per kg
A	450	20
B	400	40
C	250	60
	1100	
Standard Loss	100	
Standard Output	1000	

Actual Mix = 20000 kg

	Qty	SR per kg
A	10000	19
B	8500	42
C	4500	65

Material Price Variance = Actual Qty (AR -SR)

A	10000 (19-20) =	10000 (F)
B	8500 (42-40) =	17000 (A)
C	4500 (65-60) =	22500 (A)
		29500 (A)

Material Mix Variance = SR (Actual Qty at Actual Mix - Actual Qty at Standard Mix)

A	20 (10000 - 9409) =	11820 (A)
B	40 (8500 - 8363) =	5480 (A)
C	60 (4500 - 5227) =	43620 (F)
		26320 (F)

Actual Qty at Standard Mix is calculated as follows:

A	23000 * 450 /1100	=	9409
B	23000 *400 /1100	=	8363
C	23000 *250 / 1100	=	5227

Material Yield Variance = SR (Actual Qty at Standard Mix - Standard Qty Allowed)

A	20 (9409 - 9000) =	8180 (A)
B	40 (8363 - 8000) =	14520 (A)
C	60 (5227 - 5000) =	13620 (A)
		36320 (A)

Standard Qty Allowed is calculated as follows:

If Standard Mix/Production =	1000	Then standard quantity =	450
If Actual Mix/Production =	20000	Then standard quantity allowed =	?

the formula will be: $\frac{\text{Actual Mix/Production}}{\text{Standard Mix/Production}}$ * Individual Standard quantity

A	$\frac{20000}{1000}$ * 450	=	9000
B	$\frac{20000}{1000}$ * 400	=	8000
C	$\frac{20000}{1000}$ * 200	=	5000

Material Usage Variance = SR (Actual Qty at Actual Mix - Standard Qty Allowed)

A	20 (10000 - 9000) =	20000 (A)
B	40 (8500 - 8000) =	20000 (A)
C	60 (4500 - 5000) =	30000 (F)
		10000 (A)

OR

Material Usage Variance = Material Mix Variance +Material Yield Variance

26320 (F) + 36320 (A) = 10000 (A)

Material Cost Variance = (Actual Cost - Standard Cost)

= (10000 * 19) - (9000 * 20)

(8500 * 42) - (8000 * 40)

(4500 * 65) - (5000 * 60)

= (190000+357000+292500) - (180000+320000+300000)

= 839500 - 800000 = 39500 (A)

OR

Material Cost Variance = Material Price Variance +Material Usage Variance

29500 (A) + 10000 (A) = 39500 (A)

SALE MIX VARIANCES ILLUSTRATION

Budgeted sales is as follows:

A	800 units @ 100 per unit
B	700 units @ 200 per unit

Actual sales is as follows:

A	900 units @ 110 per unit
B	800 units @ 180 per unit

Cost per unit:

A	80
B	170

Calculate sales variances.

Sales Price Variance = Actual Qty (AR -SR)

A	900 (110-100) =	9000 (F)
B	800 (180-200) =	16000 (A)
		7000 (A)

Sales Mix Variance = SR of Gross Profit (Actual Qty at Actual Mix - Actual Qty at Standard Mix)

A	20 (900 - 907) =	140 (A)
B	30 (800 - 793) =	210 (F)
		70 (F)

Actual Qty at Standard Mix is calculated as follows:

A	1700 * 800/1500	=	907
B	1700 *700/1500	=	793

SR of Gross Proft is calculated as follows:

	Standard Sales - Standrad Cost		
A	100 - 80	=	20
B	200 - 170	=	30

AR of Gross Proft is calculated as follows:

Actual Sales - Standrad Cost

Sales Volume Variance = SR of Gross Profit (Actual Qty at Standard Mix - Budgeted Qty)

A	20 (907 - 800) =	2140 (F)
B	30 (793 - 700) =	2790 (F)
		4930 (F)

Sales Usage Variance = SR of Gross Profit (Actual Qty at Actual Mix - Budgeted Qty)

A	20 (900 - 800) =	2000 (F)
B	30 (800 - 700) =	3000 (F)
		5000 (F)

MATERIAL COSTING

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

Method	Price	Income Statement Effect		Balance Sheet Effect
		CGS	NI	
LIFO	Increase	High	Low	Low Ending Inventory
FIFO	Increase	Low	High	High Ending Inventory
LIFO	Decrease	High	High	High Ending Inventory
FIFO	Decrease	Low	Low	Low Ending Inventory

	FIFO	LIFO	WACO
COGS consists of	First purchased	Last purchased	Average cost of all item
Ending Inv. consists of	Most recent purchase	Earliest purchase	Average cost of all item

© For Suggestions & Feedbacks, contact: ATAUSH SHAFI (ataushshafi@gmail.com)

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

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

LOWER OF COST & MARKET VALUE

CASE	COST	MARKET				LCM
		Replacement Cost	**NRV/Ceiling**	**Adj NRV/ Floor**	**Market (Ltd by floor & ceiling)**	
XX	XX	XX	XX	XX	XX	XX
		1	2	3	2nd number is shown here	Low of market or cost
		2	1	3		
		3	**2**	**1**		

STORE LEDGER CARD

M/S ……

Store ledger card / bin card

(Method name)

DATE	RECEIVED			ISSUED			BALANCE		
	Unit	**U.P.**	**Amount**	**Unit**	**U.P.**	**Amount**	**Unit**	**U.P.**	**Amount**
XX-XX-200X	XX	XX	XX	XX	XX	XX	XX	XX	XX
XX-XX-200X	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**

DEFECTIVE UNITS

SPECIFIC (WIP)	ENTIRE (FOH)
Work in Process – Material Work in Process – Labor Work in Process – FOH Material Labor Factory Over Head	Work in Process – Material Work in Process – Labor Work in Process – FOH Material Labor Factory Over Head
Work in Process – Material Work in Process – Labor Work in Process – FOH Material Labor Factory Over Head	Factory Over Head Material Labor Factory Over Head
Finished Goods Work in Process – Material Work in Process – Labor Work in Process – FOH	Finished Goods Work in Process – Material Work in Process – Labor Work in Process – FOH

SPOILAGE UNITS

SPECIFIC (WIP)	ENTIRE (FOH)
Work in Process – Material Work in Process – Labor Work in Process – FOH Material Labor Factory Over Head	Work in Process – Material Work in Process – Labor Work in Process – FOH Material Labor Factory Over Head
Spoiled Goods Factory Over Head Work in Process – Material Work in Process – Labor Work in Process – FOH (Cost of Spoilage = DM+DL+FOH – Spoilage Scrap)	Spoiled Goods Work in Process – Material Work in Process – Labor Work in Process – FOH
Finished Goods Work in Process – Material Work in Process – Labor Work in Process – FOH	Finished Goods Work in Process – Material Work in Process – Labor Work in Process – FOH

SPOILAGE CALCULATION

SPECIFIC (WIP)	ENTIRE (FOH)
Recovery	Recovery + loss
Per unit cost change	Per unit cost do not change
FG cost: Total cost + Additional cost – Spoilage cost	FG cost: Total cost – Spoilage cost
Spoilage distribution: Spoilage cost / total cost * 100	Spoilage distribution: Particular cost / unit made * 100

INVENTORY CONTROLS

	WITHOUT SAFETY STOCK	WITH SAFETY STOCK
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	

ECONOMIC ORDER QUANTITY

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

Number of Orders	NO	:	AR / EOQ
Total Ordering Cost	TOC	:	ON * TOC
Average Inventory	UAI	:	EOQ / 2
Total Carrying Cost	TCC	:	UAI * TCC
Frequency of Orders	365 / NO		

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

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

C	Setup Cost.
D	Annual Demand.
H	Holding Cost.
R	Production Rate per time period.

SAVINGS CALCULATION

	EXISTING	**NEW**
Ordering Cost	AR * OC / EOQ	AR * OC / EOQ
Carrying Cost	CC * I * PU * EOQ / 2	CC * I * PU * EOQ / 2
Purchase Cost	Unit made * per unit cost	Unit made * per unit cost
	XXX	**XXX**
SAVINGS	Difference of Existing & New	

© For Suggestions & Feedbacks, contact: ATAUSH SHAFI (ataushshafi@gmail.com)

FORMAT

1. Factory cost = XXX
   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

DM	EOQ = Raw Material
WIP	EBQ = Production
FG	Working Capital Management = Store
DEBTORS	Debtor Management
CASH	

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

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

2 bin under reorder level system

- Unit of reorder level
- Excess units

Periodic review system

- Desired closing stock
- Sale unit
- Total required
- Opening stock to be bought

INVENTORY RECORDING SYSTEM	
1. Periodic system	**2.** Perpetual system
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.	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.

TWO BIN SYSTEM	
First bin = over & above reorder level	Second bin = reorder level

EOQ

Annual ordering cost =	Annual carrying cost
AD * OC / EOQ = EOQ * CC / 2 **OR** EOQ * CU * CC%/2	
EOQ^2 = 2 * AD * OC/CU * CC%	
EOQ = √ 2 * AD * OC/CU * CC%	

AVERAGE CONSUMPTION	NORMAL CONSUMPTION
Opening + closing / 2	1. Highest frequency 2. Consume most of time

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

Cash sales unit	XXX
Credit sales unit	XXX
Total sales unit	XXX
Add – Closing FG	XXX
Less – Opening FG	(XXX)
Required	**XXX**

UNCERTAINTY TO CERTAINTY

Formula for Certainty Equivalents : Uncertainty figure * probability

700000 * 5%	75000
500000 * 70%	350000
200000 * 25%	25000
	450000

EOQ VS EBQ

EOQ	EBQ
Annual Demand	Annual production
Carrying cost	Variable manufacturing cost per unit
CC%	CC%
Ordering cost	Set up cost per order
Reference to Raw Material	Reference to Finished Goods

FREE STOCK BALANCE

Physical stock	XXX
Add – Outstanding purchase order	XXX
Less – Unfulfilled share requisition	(XXX)
	XXX

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

	EXISTING	NEW
Ordering Cost	AR * OC / EOQ	AR * new OC / old EOQ
Carrying Cost	CC * I * PU * EOQ / 2	CC * I * PU * old EOQ / 2
	XXX	**XXX**
SAVINGS	**Difference of Existing & New**	

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:** **Particulars** / **Unit A** / **Unit B** Sales / Rs. 20 / Rs. 45 Variable cost / Rs. 15 / Rs. 30 Contribution / Rs. 05 / Rs. 15 Sales mix / 6000 Unit / 4000 Unit P/V Ratio / 1/4 / 1/3 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** (5*6 + 15*4)/10 = Rs. 9 per combo unit 360,000/9 = 40,000 units A: 40000/10 * 6 = 24000, B: 40000/10 * 4 = 16000 **IN SALES RATIO – Avg. P/V ratio per unit** (5*6 + 15*4)/(20*6 + 45*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:** **Particulars** / **Total Cost** / **Variable cost** / **Per U.** / **Fixed cost** Opening stock / 60,000 / 36,000 / 6.00 / Not tr. In this year Produce units / 484,000 / 297,000 / 6.75 / 187,000 Contribution required for absorption of fixed cost = Rs. 187,000 Contribution earn by opening units 6,000 *(10.5-6) = Rs. 27,000 Balance contribution = Rs. 160,000 = 160,000/3.75 = 42,667 = Total sale of units = 6,000+42,667 = 48,667.

BEP in case of change in variable cost at various level 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:** **Particulars** / **Plant A** / **Plant B** Variable cost (per unit) / 8.00 / 6.50 Fixed cost / 90,000 / 120,000 Which is more profitable and state the level in units and compare the cost par 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:** **Particulars** / **Plant A** / **Plant B** Working capacity / 70% / 60% Sales / 350 / 240 VC / 280 / 180 Contribution / 70 / 60 Fixed cost / 50 / 45 Profit / 20 / 15 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%	A	B	Total
Sales	500	400	900
Less: VC (100%)	400	300	700
Contribution	**100**	**100**	**200**

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

Sales value on BEP = 95/22.22% = Rs.427.50

(2) At 50 % capacity

Sales (900 * 50%)	=	450
Contribution (450 * 22.22%)	=	100
Less : Fixed cost	=	95
Profit	**=**	**5**

MULTI PRODUCT PROFIT STATEMENT

Sale	XX
Less - VC	XX
Contribution	XX
Less – Specific Fixed Cost	XX
Total	XX
Less- General Fixed Cost	XX
Profit	**XX**

FACTORY OVERHEAD

OVERALL VARIANCE / TOTAL VARIANCE / OVER OR UNDER APPLIED FOH

Actual FOH (Fixed + Variable)	XXX
Applied FOH (Actual capacity attained * FOH Applied Rate)	(XXX)
Under / Over Applied	**XXX**
FOH Applied Rate : Estimated FOH/Estimated Capacity level	
Under applied/ Dr/ Unfavorable **&** Over applied/ Cr/ Favorable	

CAPACITY / VOLUME VARIANCE

Applied FOH	XXX
Budgeted GOH for capacity attained (Fixed FOH + Actual capacity attained * FOH variable rate)	(XXX)
	XXX
FOH Variable Rate : Estimated Variable FOH/Estimated Capacity level	

SPENDING/ BUDGETED / EXPENDITURE

Budgeted FOH for Capacity Attained	XXX
Actual FOH	(XXX)
	XXX

FORMULAE

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

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

	Absorption Costing	Marginal Costing
Prime Cost	Product Cost	Product Cost
Variable FOH	Product Cost	Product Cost
Fixed FOH	Product Cost	Period Cost
Admin – Variable	Period Cost	Period Cost
Admin – Fixed	Period Cost	Period Cost
Selling – Variable	Period Cost	Period Cost
Selling – Fixed	Period Cost	Period Cost

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

FOH CAPACITIES

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. **Activity level** — **$** High (A) — Total cost of A Low (B) — Total cost of B **Difference:** **(A – B) units** — **TC of A – TC of B** • From this difference, we can therefore calculate the variable cost per unit of activity. • **Variable cost per unit** = $(TC of A – TC of B)/ (A – B) units
Step 3	Having calculated the variable cost per unit, apply this value to the cost of either the highest or the lowest activity level. (It does not matter whether you use the high level or the low level of activity. Your calculation of fixed costs will be the same.) Calculate the total variable costs at this activity level.
Step 4	The difference between the total cost at this activity level and the total variable cost at this activity level is the fixed cost. **Substitute in the 'low' equation** — **Cost** **$** Total cost of (low volume of activity) — TC of B Variable cost of (low volume of activity) — V Therefore fixed costs per period of time — **TC of B - V** You now have an estimate of the variable cost per unit and the total fixed costs.

RESPONSIBILITY CENTERS

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

BASES OF FOH APPORTIONMENT

The following tables indicates the various bases of apportionment for the usual items of factory overhead	
Item of factory Overhead	**Basis of apportionment**
Rent	Area or volume of building
Depreciation of Machinery	% of original cost of machinery or machine hour rate
Power	Horse power multiplied by machine hours or KWH or value of machine.
Electric lighting	Number of light points or area
Canteen expenses	Number of employees
Store-keeping and materials handling	Number of stores requisition or material consumed
Indirect wages of maintenance	Estimated of actual time spent. or direct wages

department	
Delivery expenses	Weight, volume or ton-kilometre
Repairs of plant	Value of plant.
Supervision	no. of machine/employee or Direct wages
Fire Insurance	Value of Asset or area occupied
Machine shop exp	Machine hours or Labours hours.
General Exp	Direct Wages or No. of Employees
Audit Fees	Sales or total cost
Maintenance of building	Area or labour hours
Repair and Maintenance Cost	Value of assets or hours worked for each department
Stores Department	No. of stores requisitions
Canteen Exp	No. of meal served or no. of employees.
Transport Dept	Weight or volume or ton-km.
Civil Service Dept	Area.
Purchase Department	No. of purchase orders placed or value of materials purchased for each department.
Crane service	Crane hours or weight of materials handled
Time-keeping	No. of employees
Power house	Heat area of cubic contents or KWH
Tool Room	Direct Labour hours
Inspection	Number of units
Hospital and Dispensary	Number of units

BREAK EVEN ANALYSIS

FORMULAE

Breakeven point	Fixed Cost/C/M Ratio (Contribution Margin Ratio) • C/M Ratio = Contribution / Sales * 100 OR Fixed Cost 1 – Variable cost / Sales OR Fixed Cost Contribution per unit (S.P. Per Unit – V.C. Per Unit) IN VALUES Fixed Cost C/M Ratio (Contribution Margin Ratio) • C/M Ratio = Contribution / Sales * 100 • Contribution Margin= Contribution Sale - Profit Volume.
In opening stock	Units from opening stock + (total fixed cost – total contribution from opening stock/Current Contribution per unit)
Contribution margin	Sale – Variable Expense
Profit computation	(Sale * C/M Ratio) – Fixed Cost
New fixed cost	Sale - {C/M – (Margin of safety * C/M)}
Old fixed cost	(Sale – (100 – Margin of safety) * C/M Ratio
Variable expenses	(1 -- C/M Ratio) * Sales
Contribution margin ratio	Contribution * 100 Sales **OR** Change in Profit * 100 Change in Sales **OR** Change in Contribution * 100 Change in Sale **OR** Change in Total Cost * 100 Change in Sale **OR** Sale – Variable Expense * 100 Sales **Decision Clue** = Higher the C/M ratio → more will be the profit. Lower the C/M ratio → lower will be the profit.
Sale projection	Fixed Cost + Profit (Loss) Projection C/M Ratio (Contribution Margin Ratio)

	OR Fixed Cost + Profit Projection / (1-tax rate) C/M Ratio (Contribution Margin Ratio)
Extra units sold to maintain same profit	Revised Units – Existing Units
Increase in selling price	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
No of unit sold to get desired level of profit	**IN UNITS:** Total Required Contribution (Fixed cost + Target profit) Contribution per unit (Sale per unit – Variable cost per unit) **IN VALUES:** Total Required Contribution (Fixed cost + Target profit) C/M Ratio (Contribution Margin Ratio) • C/M Ratio = Contribution / Sales * 100
Tax impact	(Change in volume in units) * (contribution margin per unit) * (1 – tax rate)
Net decline in contribution margin	Decline in Revenue (unit produce * old sale price – new sale price) XXX Decline in Cost (Further Processing Cost) XXX **XXX** Note: No offer acceptance if net decline in contribution margin & vice versa.
Margin Safety Ratio	Selected sale figure – break even point * 100 Selected sale figure **OR** Profit / C/M Ratio * 100 **IN UNITS =** Actual/Budgeted unit sold – break even unit
Layman Rule	Total Cost = Total Revenue
Accountant Rule	Contribution Margin = FC+ Profit
Cash BEP	Cash Fixed Cost Cash C/M Per Unit • Cash FC means all FC excluding Depreciation+ Amortization + all non cash items. • It determines at point where total cash cost & total sales line intersect each other.
Revised P/V ratio	Revised contribution margin per unit Revised sale price per unit
New Contribution	Given Contribution – Variable Costs
Rule	No variable expense, all sale price will be C/M
Profit	margin of safety % * C/M %
Margin of safety	total sales – break even sales
Margin of safety %	total sales – break even sales / total sales

Total sales	Margin of safety profit
Profit	Sales * margin of safety % * C/M %
Required Contribution	Fixed Cost + Target Profit – Target Loss – Donation – Shut down
Margin of Safety	Profit / C/M % **OR** Profit / C/M Per Unit
Sale Price	Fixed Cost/Unit + Variable Cost Per Unit
At Break Even Level	Sale – VC – FC = Profit **OR** Sale = VC + FC + Profit
Target Profit	Sale = VC + FC + Profit
Cost Break even point	It is the production level at which production cost is same irrespective of the alternative adopted. Cost B.E.P. = Difference in fixed costs / Difference in variable costs
Tax Impact	Before (Divide) = After Tax Income/1-t After (Multiply) = Before Tax * (1-t)
Sale * C/M ratio = FC + Profit	
Break even sale * C/M ratio = FC – Break even sales	
Profitability	Contribution / key factor
Contribution / key factor	Annual production / Install capacity
(Break even sale + M/S ratio) * C/M ratio = Contribution	
(Break even sale + C/M ratio) * (M/S ratio * C/M ratio) = FC + Profit	
BEP Sales (%) + MOS Sales (%) = 100 %	
Contribution at BEP = Fixed cost	
Contribution at MOS = Profit	
Contribution on BEP + Contribution on MOS = Total Contribution	
Fixed Cost = BEP Sales * PV Ratio	
Profit = MOS sales * PV Ratio	
Variable cost = per unit cost is constant but change in total amount.	
Fixed cost = Change in per unit cost but total cost are constant.	
Semi variable Cost = It is Combination of Variable cost and fixed cost.	
If sales price constant than variable cost change in same ratio to sales changes.	
If sales price is change but sales Qty is same than Variable cost also constant but only change in P/V Ratio.	
Question say find out increase in sales price to req. BEP at ….% Than % increase in Sales price = (Current BEP – Revised BEP) / Revised BEP	

POINTS

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.

CHECK

Sale	XXX
Less – Variable Cost	XXX
Contribution	XXX
Less- Fixed Cost	XXX
Profit	**XXX**

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.

Large Margin of Safety	Indicator of strength as substantial reduce in sales & production, profit will be made.
Small Margin of Safety	Indicator of weakness as small reduce in sales & production, loss will be made.

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.

Large Angle of Incidence	Profit at high rate
Small Angle of Incidence	Profit at low rate

REQUIRED SALE TO EARN TARGET PROFIT

In Rupees	In %
Fixed cost + target profit / CM %	Fixed cost / CM % - Target Profit %

AFTER TAX CALCULATIONS

In Rupees	In %
Fixed cost + Net Profit / (1-t) / CM %	Fixed cost + / CM % - Net Profit / (1-t)

PRODUCT MIX

In %	Per Unit
Fixed cost + Target Profit / CM %	Fixed cost + Target profit / CM per unit

- C/M % = total contribution / total sales * 100
- C/M per unit = total contribution / total sales

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

Head	Increase to be shown in
FC	Total
VC	Per unit

REQUIRED SALES

Fixed Cost + Target Profit	XXX
Less - X & Y Contribution (Demand*Contribution Per Unit)	(XXX)
Z's Contribution	XXX
	Divided By
Per Unit contribution of Z's	XXX
Required sales	**XXX**

ACCOUNTANT VS ECONOMIST

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

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

	Rs:
Variable costs for 1,700 units (1,700 * Rs: 30)	51,000
Fixed costs	20,000
Total cost for 1,700 units	**71,000**

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!)

Figure 3.1 Basic breakeven chart

CONTRIBUTION BREAKEVEN CHART

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.

Figure 3.2 Contribution breakeven chart

PROFIT/VOLUME (P/V) GRAPH

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.

Figure 3.4 Showing changes with a profit–volume chart

SOLUTION

The two lines have been drawn as follows:

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

		Rs: 000
Contribution	70,000 * Rs: (30 - 28.50)	105
Fixed costs		(30)
Profit		**75**

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.

		Rs: 000
Contribution	70,000 * Rs: (35 - 33)	140
Fixed costs		(45)
Profit		**95**

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

Marginal costing	Direct Material + Direct Labor + Variable FOH
Absorption costing	Direct Material + Direct Labor + Total FOH
Fixed FOH (under absorption)	Fixed FOH * Actual capacity/Production Normal Capacity **Note:** If actual capacity is missing, it is assume that normal capacity is actual capacity.
Finished goods inventory	Total COGM * (purchase unit + Opening stock – sale unit) Actual capacity/production
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:

ABSORPTION COSTING DIAGRAM:

ABSORPTION/FULL/TRADITIONAL/CONVENTIONAL COSTING

Sale		XXX
Less- Cost of Goods Sold:		
Direct Material	XXX	
Direct Labor	XXX	
Factory Overhead Applied (Fixed + Variable)	XXX	
Cost of Good Manufactured	XXX	
Add – Opening Finished Goods	XXX	
Less – Closing Finished Goods	(XXX)	
Cost of Goods Sold	XXX	
Add – Under Applied	XXX	
Less –Over Applied	(XXX)	
Cost of Goods Sold (Adjusted)		(XXX)
Gross Profit		XXX
Less – Operating Expenses:		
Selling overhead (Fixed + Variable)	XXX	
Administration overhead (Fixed + Variable)	XXX	(XXX)
Operating Profit/ Net Profit		**XXX**

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

Sale		XXX
Less- Cost of Goods Sold:		
Direct Material	XXX	
Direct Labor	XXX	
Factory Overhead Applied (Variable only)	XXX	
Variable Cost of Good Manufactured	XXX	
Add – Opening Finished Goods	XXX	
Less – Closing Finished Goods	(XXX)	
Cost of Goods Sold	XXX	
Add – Under Applied	XXX	
Less –Over Applied	(XXX)	
Cost of Goods Sold (Adjusted)		(XXX)
Gross Contribution		XXX
Less – Variable selling & administration overhead		(XXX)
Net Contribution		XXX
Less – Operating Expenses:		
Selling overhead (Fixed)	XXX	
Factory overhead (Fixed)	XXX	
Administration overhead (Fixed)	XXX	(XXX)
Operating Profit/ Net Profit		**XXX**

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

Net income (Absorption costing)	**XXX**
Less- Difference in closing stock	XXX
Add- Difference in opening stock	XXX
Net income (Marginal costing)	**XXX**
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

ABSORPTION COSTING	MARGINAL COSTING
	• 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. • Marginal cost is the variable cost of one unit of product or service. • If volume of sales falls by one unit, profit will fall by amount of contribution earned from that unit.
Fixed production cost are absorbed into the cost of units & carried forward.	Fixed production cost are treated as period cost & written off as incurred.
Absorption costing will report high profit when stock level increases as fixed overhead will be carried forward to closing stock.	
Closing stocks are valued at full production cost.	Closing stocks are valued at marginal/variable production cost.
Absorption costing will report low profit when stock level decreases.	
	When unit of product is made, the extra cost incurred in its manufacture is variable production costs. Fixed costs are unaffected & no extra fixed costs are incurred when output is increased.

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	
Differential costing	**Marginal Costing**
Scope	
Wider than marginal costing.	Narrower than differential costing.
Variability	
Both fixed and variable costs are considered	Only variable costs are considered.
Definition	
Cannot be precisely defined except in terms of increase or decrease in total costs.	Can be defined as prime cost plus variable overheads.
Basis of Decision Making	
Comparison of differential cost with incremental / decremental revenue.	Margin of contribution and profit volume.
Incorporation in Accounting System	
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.	Marginal costs may be incorporated in the accounting system.
Applicability	
Applicable to both, long term as well as short term decision making.	Applicable only to short term decision making.

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; 4per hour and overtime is paid at time and a quarter. Eight hours of overtime is paid as follows:
      1. Basic Pay (8*4) = 32
      2. Overtime (8*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

Hasley constant partial sharing scheme	Wage rate * 50% * time save
Taylor differential piece rate plan	Wage rat e * time save / time allowed * time taken
Unit	Production
Time	Hour
Unit Labor Cost	Labor / Units
Unit Overhead Cost	FOH / Units
Conversion Cost Per Unit	DL + FOH / Units
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
	Added value of the product / Total wages cost
Premium Costing Methods	Directly charged to production
	Treated as overhead element
	Charged to income statement as period costs
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) From66-2/3% 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 every1% increase in efficiency beyond 100%
Bedaux Pont System	Earnings= hours worked* rate per hour + 75%of hours saved*rate per hour
Taylor's System	a) Efficiency Less than 100% = Payment is 80% of piece rate b) Efficiency of 100% or more = Payment is 120% of piece rate
Merrick differential piece rate System	a) For efficiency up to 83% = payment is ordinary piece rate b) For efficiency from 83% to 100% = payment is 110% of ordinary piece rate c) For efficiency more than 100% = Payment is 120% of ordinary piece rate
Barth System	Earnings = rate per hour * √standard hour * hours worked

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.

	Worker – 1	Worker – 2
Standard time allowed in hours	8	8
Actual time taken in hours	4	6
% bonus (Standard time allowed in hours - Actual time taken in hours) / Standard time allowed in hours	8-4/8*100 = 50%	8-6/8*100 = 25%

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

	Standard Production	Below Production	Above Production
Piece Produced	300	291	345
Production % to standard	100%	97%	115%
Wages Calculation			
	Normal Wage	Normal Wage	Normal Wage
	Bonus	-	Bonus
	-	-	Additional Bonus (wage + bonus * %)

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

Production	Productivity
Quantity or volume of output produced.	Measure of efficiency with which output has been produced.
Relative measure of hours actually taken & the hours that should have been taken to make the output.	
Improved productivity is the mean of reducing total unit costs.	

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

Basic pay of direct worker	Direct cost
Basic pay of indirect worker	Indirect cost unless customer asks for order which involve dedicated use of indirect worker time
Bonus	Indirect cost
Wage of support staff	Indirect costs
Idle time	Indirect costs
Cost of work on capital equipment	Added to cost of equipment
Employers National insurance contribution	Indirect labor costs
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

IDLE TIME	
Normal Idle time	*Should be charged to the cost of production*
Abnormal Idle time	*Should be charged to Costing Profit and Loss account.*

COST CYCLE

GENERAL	HEAD OFFICE	FACTORY
Purchase of Material: Material Control Voucher/Account Payable	**Purchase of Material:** Factory Ledger Voucher/Account Payable	**Purchase of Material:** Material Control General Ledger
Return of Material: Voucher/Account Payable Material Control	**Return of Material:** Voucher/Account Payable Factory Ledger	**Return of Material:** General Ledger Material Control
Material Issued: Work-in-Process Factory Overhead Material Control	NO ENTRY WILL BE RECORDED AT HEAD OFFICE.	**Material Issued:** Work-in-Process Factory Overhead Material Control
Material Returned: Material Control Work-in-Process Factory Overhead	NO ENTRY WILL BE RECORDED AT HEAD OFFICE.	**Material Returned:** Material Control Work-in-Process Factory Overhead
Factory Overhead: Factory Overhead Prepaid Expenses Allowance for Dep Various Credits	NO ENTRY WILL BE RECORDED AT HEAD OFFICE.	NO ENTRY WILL BE RECORDED AT FACTORY OFFICE.
FOH Payment: Various Credits Voucher Payable	NO ENTRY WILL BE RECORDED AT HEAD OFFICE.	NO ENTRY WILL BE RECORDED AT FACTORY OFFICE.
FOH Disposal: Voucher Payable Cash	NO ENTRY WILL BE RECORDED AT HEAD OFFICE.	NO ENTRY WILL BE RECORDED AT FACTORY OFFICE.
FOH Applied: Work-in-Process FOH Applied	**FOH Applied:** Factory Ledger FOH Applied	**FOH Applied:** Work-in-Process General Ledger
Disposal FOH Applied: FOH Applied FOH Control	NO ENTRY WILL BE RECORDED AT HEAD OFFICE.	NO ENTRY WILL BE RECORDED AT FACTORY OFFICE.
Payroll: Payroll Income tax with held Provident fund Accrued Payroll	NO ENTRY WILL BE RECORDED AT HEAD OFFICE.	NO ENTRY WILL BE RECORDED AT FACTORY OFFICE.
Payroll Payment: Accrued Payroll Voucher Payable	NO ENTRY WILL BE RECORDED AT HEAD OFFICE.	NO ENTRY WILL BE RECORDED AT FACTORY OFFICE.
Payroll Disposal: Voucher Payable Cash	NO ENTRY WILL BE RECORDED AT HEAD OFFICE.	NO ENTRY WILL BE RECORDED AT FACTORY OFFICE.

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
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.	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		
Nature:	The WIP account is used to record the costs of production – direct materials, direct labour and production overheads absorbed.	
	Debit	**Credit**
1) Direct materials issued from stores to production	WIP account	Raw materials account (stores account)
2) Direct labour costs in production	WIP account	Wages and salaries account
3) Production overheads absorbed into production costs	WIP account	Production overheads Account
FROM RAW MATERIALS TO COST OF SALES		
Nature:	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.	
	Debit	**Credit**
1) Direct materials issued from stores to production (work in progress)	WIP account	Raw materials account (stores account)
2) Completed production transferred from WIP to finished goods (at production cost)	Finished goods account	WIP account
3) Finished goods sold to customers	Cost of sales Account	Finished goods account (production cost of sales)
NON-PRODUCTION OVERHEADS		
Nature:	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.	
	Debit	**Credit**
1) Administration overheads	Cost of sales account	Administration overheads account (administration

		overheads for the period)
2) Sales and distribution overheads	Cost of sales account	Sales and distribution overheads account (sales and distribution overheads for the period)

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.	
	Debit	**Credit**

Sales	Sales account	Income statement account
Cost of sales	Income statement account	Cost of sales account
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.	
	Debit	**Credit**
Direct materials issued from stores to production	WIP account	Raw materials account (inventory account)
Direct labour costs in production	WIP account	Wages and salaries account
Indirect materials		
Indirect materials issued from stores to production cost centres	Production overheads account	Raw materials account (inventory account)
Indirect materials issued from stores to administration cost centres	Administration overheads account	Raw materials account (inventory account)
Indirect materials issued from stores to sales and distribution cost centres	Sales and distribution overheads account	Raw materials account (inventory account)
Indirect labour		
Indirect labour production Cost	Production overheads account	Wages and salaries account
Administration costs of Labour	Administration overheads account	Wages and salaries account
Sales and distribution labour costs	Sales and distribution overheads account	Wages and salaries Account

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 Absorbed	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

Profit as per cost accounts	**XX**
Add:	
1. Income and profits taken in financial accounts and not in cost accounts.	XX
2. Notional expenses taken in cost accounts and not in financial accounts.	XX
3. Over-absorption overheads in cost accounts.	XX
4. Excess valuation of opening inventory in cost accounts as compared to valuation in financial accounts.	XX
5. Lower valuation of closing inventory in cost accounts as compared to valuation in financial accounts.	XX
6. Excess depreciation accounted for in cost accounts.	XX
Less:	
1. Expenses and losses accounted for in financial accounts and not in cost accounts.	XX
2. Appropriations in financial accounts only.	XX
3. Notional income taken in cost accounts and not in financial accounts.	XX
4. Under-absorption of overheads in cost accounts.	XX
5. Lower valuation of opening inventory in cost accounts as compared to valuation in financial accounts.	XX
6. Higher valuation of closing inventory in cost accounts as compared to valuation in financial accounts.	XX
7. Lower depreciation accounted for in cost accounts.	XX
Profit or loss as per Financial A/c	**XX**

JOB ORDER COSTING

JOB COST SHEET FORMAT

JOB ORDER COST SHEET						
			Job #			
Customer Name			Date Started	:	XXX	
Description			Date Ordered	:	XXX	
Quantity			Date Wanted	:	XXX	
			Date Completed	:	XXX	
DIRECT MATERIAL						
Date	Department	Description		Unit Cost		Total
XX	XX	XX		XX		XX
XX	XX	XX		XX		XX
TOTAL						XXX
DIRECT LABOR						
Date	Department	Description	Hour	Rate		Total
XX	XX	XX		XX		XX
XX	XX	XX		XX		XX
TOTAL						XXX
APPLIED FACTORY OVERHEAD						
Date	Department	Basis	Hour	Rate		Total
XX	XX	XX		XX		XX
XX	XX	XX		XX		XX
TOTAL						XXX
SUMMARY						
	DIRECT MATERIAL	: XXX	Selling Price		:	XXX
	DIRECT LABOR	: XXX	Less – Factory Cost	XXX		
	APPLIED FACTORY OVERHEAD	: XXX	Admin Exp	XXX	:	(XXX)
	TOTAL	: XXX	Profit			XXX

Date Started	WIP
Date Finished	FG
Date Sold	COGS

BID PRICE / MINIMUM SALE PRICE

Direct Material	XXX
Direct Labor	XXX
Factory Overhead	XXX
Admin Exp	XXX
Selling Exp	XXX
Other Exp	XXX
Total Cost	XXX
Allowance for contingency	XXX
Bid Price/ Minimum Sale Price	**XXX**

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
BASIC	Job Cost	Job Cost	Job Cost
OVERTIME PREMIUM	FOH	FOH	Other Job Cost

RECTIFICATION WORK

Normal Activity	Charge to FOH
Not Normal Activity	Charge to JOB

PAST PAPERS

Q # 1 [spring – 2011]

A

Sales	(180000*12*110)		273600
Less- Material – A	(2025000*45)	91125	
Material – B	(675000*30)	20250	
Labor	(18000/200 = 90*180000*12*20/60)	64800	
V/FOH	(180000*12/80% * 15)	40500	
F/FOH		10000	
Cost of Goods Sold			(226675)
Gross Profit			**46925**

Workings:

Material: 180000*12/80% = 2700000 (Material – A: 2025000 + Material –B: 675000)

B

Sales	(180000*12*110)		273600
Less-			
Material – A	(1800000*48)	86400	
Material – B	(600000*30)	18000	
Labor	(See Working)	54108	
V/FOH	(180000*12/90% * 15 – 20%)	28800	
Depreciation	(7.5 Million/5)	1500	
F/FOH	(10000 -15%)	8500	
Cost of Goods Sold			(197308)
Gross Profit			**40292**

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 / C/M Per Unit = 61000+65660 /208 = 608.942 units

Target profit:

Profit of Q: 1	=	62540	
Shortfall of Q: 2	=	3120	(62540-59420)
		65660	

C/M Per

Unit Revise Sale Price (860-15)	=	845
VC	=	(637)
C/M	=	**208**

Note = 464400/540000 = 860

	FOH	Selling
580000	84660	26500
540000	80580	25500
40000	**4080**	**1000**
VC (Per Unit)	**102**	**25**
FC	**25500**	**12000**

VC Per Unit:

Material	(183.6/540)	=	340
Labor	(91.8/540)	=	170
FOH		=	102
Selling		=	25
			637

Total FC

FOH	=	25500
Selling	=	12000
Admin	=	23500
		61000

PART - B

Minimum Sales Price =

Total Variable Cost (650 * 637)	=	414050
Total Fixed Cost (61000 + 2500)	=	63500
Target Profit	=	65600
Total Sale Value Required	=	543210
Sale Price will be	=	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.

VC (25000*200) = **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.

= x- 0.04 = 225000 → x = 225000/0.04 = 234375

234375-225000 = 9375 is Normal loss for total production but e 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
			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:

Material	=	17033125
Labor	=	10018125
V/FOH	=	5765625
F/FOH	=	3300000
		36116875

Profit is 20% of Sale price

= X – 0.2x = 36116875 →0.8x = 36116875 →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)

نوٹ : Base year کی Consumption کو Standard per kg کہتے ہیں۔

Q # 6 [Autumn – 2004]

	Without Discount	With Discount
Material (42*37)	1554	
(42*36.9)		1549.8
Direct Labor	850	850
Direct Material	300	300
Total Variable Cost	**2704**	**2699.8**
Sale Price	2862	2862
C/M	**158**	**162.2**
Annual FC	6007320	6307320
BE Unit (FC / CM per unit)	**38021**	**38886**

Q # 6 [Spring – 2005]

Main Point = No VC is given, then all Sale Price will be assumed to be C/M.

Req # 01

	4550/4000	4550/5000
BEP	1138	910

Req # 02

Revise FC	3550	3550
C/M	3000	3750
BEP	1138	947

Req # 03

Note: Eliminate the difference will be indifferent.

Saving in FC	1000/1000 (4000*25%)	1000/1250 (5000*25%)
No of Tickets (for indifferent point)	1000	800

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:

Working Capital	=	800000
Running Finance	=	50000
Less – Admin	=	152700
Marketing	=	72842
Finance Cost (500000*24%*6/12)	=	60000
Total	=	**285542**
Total Grand	=	1014458

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]

	Dress	**Scraf**	**Handbag**
60% completed	11700	11700	11700
10% dress & scraf	1950	1950	-
20% dress & handbag	3900	-	3900
10% dress only	1950	-	-
Total Units (15000 * 30% = 19500)	**19500**	**13650**	**15600**
Existing Units	15000	-	-
Incremental Units	**4500**	**13650**	**15600**

Incremental Sales Value			
Dress (4500*2000)		9000000	
Scraf (13650*400)		5460000	
Handbag (15600*500)		7800000	
Total Sales			22260000
Incremental Costs			
Material (4500*3.5*100)		1575000	
Cost of designer		150000	
Hooks (15600*8)		124800	

Reduction in Resale value:			
Existing (15000*20)	300000		
Revised (19500*5)	(97500)	202500	
Cutting Costs:			
Dress (4500*35)	157500		
Scraf (13650*75)	204750		
Handbag (15600*20)	312000	674250	
Other:			
Dress (4500*2000 * 40%)	3600000		
Scraf (13650*400*55%)	3003000		
Handbag (15600*500*60%)	4680000	11283000	
Total Costs			(14009550)
Incremental Profit			8250450

Q # 7 [Autumn – 2003]

Req # 01

	Semi	Auto
Buy Cost	2000	2000
Variable Manufacturing Cost	1500	1200
Savings	500	200
FC	5000000	10000000
Quantity to justify (FC / Savings)	**10000**	**12500**

Req # 02

	Semi	Auto
Annual Requirement	15000	15000
Savings	500	800
Total Savings	7500000	12000000
FC	5000000	10000000
Net Saving	**2500000**	**2000000**

Req # 03

Difference in VC savings	=	300 per unit
Difference in FC	=	5000000
Quantity to justify allocation	=	16667 (5000000/300)

Q # 3 [Autumn – 2007]

Finished Goods	=	20000/97%	=	20619
Raw Material	=	20619/98%	=	21040
Direct Material	=	21040 * 42.3	=	889992

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]

C/M Per unit = 4500000/300000 + 30 = 45

Effect on profit:

a) Stitching elimination

Loss of C/M	(300000*10% = 30000*45)	=	(1350000)
Reduction of VC	(300000-10% = 270000*6)	=	162000
Net Benefit		=	**270000**

b) Use of plastic eye

Cost of glass eye	(300000-10% = 270000*2/95%*4/100)	=	227368
Cost of plastic eye	(300000-10% = 270000*2/90%*3/100)	=	(180000)
Net Benefit		=	**47368**

c) Filling material

Cost of synthetic	(300000-10% = 270000/2000*1600)	=	216000
Net loss of using scrap	(300000-10% = 270000 *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:

Sale	21000
Closing Stock (21000*10%)	2100
	23100
Opening Stock (19000*5%)	(950)
Unit Made	**22150**

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 =

Material (5 kg * 95% = 4.75*60*4%)	62.4
Material Inspect (4.75*2)	9.50
Labor (4*85%=3.4*75*1.1)	280.50
Labor Incentive (4*15% =0.6*82.5(75+10%)*30%)	14.85
V/FOH (15*1.05*3)	47.25
Variable Selling (10 m * 30% /19000)	157.89
Total	**806.39**

VC per unit on 30-06-10 for Opening Stock =

Material (5*60)		300
Labor (4*75)		300
V/FOH (15*3)		45
Total		**645**
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?

		Rs.
Fixed Cost (7600000*12)		91200000
Target Profit		-
Required Contribution		91200000
Less – A (Large) = (250000*120 <**W-1**>)	30000000	
B (Small) = (150000*45 <**W-2**>)	6750000	
B (Large) = (225000*150 <**W-3**>)	33750000	(70500000)
		20700000
		÷
B (Small) C/M Per Unit <**W-4**>		90
Number of Unit Sold (Small Pack: B)		**230000**

W-1:

A	=	**large Pack**
C/M	=	Sale – VC
25%	=	100% - 75%
VC	=	120/25*75 = 360
Sale	=	120/25*100 = 480
C/M	=	480-360=120

W-2:

A	=	**Small Pack**
VC	=	360*67.5% = 243

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:

Sale	=	480*3/5 = 288
C/M	=	288-243=45

W-3:

B	=	**large Pack**
C/M	=	Sale – VC

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:

Here, C/M	=	2
VC	=	3
C/M	=	Sale – VC
2	=	5 - 3
Sale	=	150/2*5 = 375
VC	=	150/2*3 = 225
C/M	=	325 – 225 = 150

W-4:

B	=	**Small Pack**
Sale	=	375*64% = 240

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:

VC	=	225*2/3 = 150
C/M	=	240-150 = 90

(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%.

		Rs.
Fixed Cost (7600000*12)		91200000
Target Profit (10530000/1 – 0.25)		14040000
Required Contribution		105240000
Less – A (Large) = (250000*120 <**W-1**>)	30000000	
B (Small) = (150000*45 <**W-2**>)	6750000	
B (Large) = (225000*150 <**W-3**>)	33750000	(70500000)
		34740000
		÷
B (Small) C/M Per Unit <**W-4**>		90
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.

PRODUCT WISE INCOME STATEMENT

Products	Sale Per Unit	VC Per Unit	Sale Volume	Sales	VC	C/M
A – Large Pack	480	360	250000	120000000	90000000	30000000
A – Small Pack	288	243	150000	43200000	36450000	6750000
B – large Pack	375	225	225000	84375000	50625000	33750000
B – Small Pack	240	150	386000	92640000	57900000	34740000

CONSOLIDATED INCOME STATEMENT

	Rs.
Sales	340215000
Less - VC	(234975000)
C/M	105240000
Less - FC	(91200000)
Budgeted Profit Before Tax	14040000
Less - Tax	(3510000)
Budgeted Profit After Tax	**10530000**

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:

Required	:	120 ft
Available	:	(300 ft)
Balance	:	180 ft

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
Required	:	130 ft (80 ft + 50 ft)
Available	:	(60 ft)
Balance	:	70 ft

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	=	% of Direct Labor (FOH)
Y	=	% 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:

	Petal	**Leaf**
Direct Material	20000 (250*80)	16000 (125*128)
Direct Labor	18000 (720*25)	24000 (960*25)
Factory Overhead	18000 X	24000 X
Admin Overhead	20000 Y	16000 Y
Total Cost	**52000 (Calculated as below)**	**56000 (Calculated as below)**

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

8000 Y = 2000

Y = 2000/8000 = 25%

Applying Y: 25% on equation # 01, we will get:

38000 + 18000 X + 20000 (0.25) = 52000

38000 + 18000 X + 5000 = 52000

43000 + 18000 X = 52000

18000 X = 52000 – 43000

18000 X = 9000

X = 9000/18000 = 50%

Check: If we apply X: 50% & Y: 25% on the variables given in the table, we will get the same answers.

	Petal	**Leaf**
Direct Material	20000 (250*80)	16000 (125*128)
Direct Labor	18000 (720*25)	24000 (960*25)
Factory Overhead	9000 (18000*50%)	12000 (24000*50%)
Admin Overhead	5000 (20000*50%)	4000 (16000*50%)
Total Cost	**52000**	**56000**

Q # 5 [Autumn – 2012]

Required	**Material – A**	**Material – B**
Alpha (900 + 200 = 1100)	2200 (1100*2)	2200 (1100*2)
Beta (3000 + 300 = 3300)	0 (3300*0)	9900 (3300*3)
Gamma (5000 + 400 = 5400)	16200 (5400*3)	21600 (5400*4)
	18400	33700
Available	(22000)	(34000)
Excess	**(3600)**	**(300)**

Limiting factor will either be given in the question or calculated as follows:

Cost / Per Hour Rate

	Alpha	Beta	Gamma	Zeta
Sale Price	66	88	106	40
Direct Material (A)	(8)	(0)	(12)	-
Direct Material (B)	(12)	(18)	(24)	(15) -- (2.5*6)
Direct Labor	(25)	(30)	(25)	(10) – (10*1)
Direct Material	(3.1)	(3.2)	(2.7)	(1) – (0.4+0.6)
Contribution	**17.9**	**36.8**	**42.3**	**1.4**
	÷	÷	÷	÷
Limiting Factor	**2**	**3**	**4**	**2.5**
CPSH	**8.95**	**12.26**	**10.57**	**5.6**
Ranking	**3**	**1**	**2**	**4**

Variable Overhead for Zeta will be calculated as follows:

	Alpha	Beta	Gamma
Machine Hour (02)	1.6/8 = 0.2	1.4/7 = 0.2	1.2/6 = 0.2
Labor Hour (01)	1.5/2.5 = 0.6	1.8/3 = 0.6	1.5 /2.5 = 0.6
Total Per Unit Cost:			
Machine Hour	2*0.2 =0.4	2*0.2 =0.4	2*0.2 =0.4
Labor Hour	1*0.6 = 0.6	1*0.6 = 0.6	1*0.6 = 0.6
Total	0.10	0.10	0.10

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]

	5 Months	7 Months
Capacity	**87500** (300000*5/12*70%)	**161000** (300000*7/12*92%)
Sale Price (87500*34)	2975000	?
Direct Material (87500*12) & (161000*12)	(1050000)	(1932000)
Direct Labor (Higher of Rs: 8/- OR Rs: 150000 per month)	(750000)	(1288000)
Variable Overhead (87500*6) & (161000*6)	(262500)	(472500)
Semi Variable	(262500)	(472500)
Fixed Overhead (750000*5/12) & (750000*7/12)	(312500)	(437500)
Profit	**75000**	
Cost for 7 months		**5096000**

Semi-variable cost will be calculated as follows:

At 55% Capacity	37500 (450000/12)	
At 70% Capacity	52500 (4500000+180000 = 630000/12)	**262500** (52500*5)
At 92% Capacity	67500 (630000+180000 = 810000/12)	**472500** (67500*7)

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:

$$\textbf{Required Contribution} = \frac{\textbf{Fixed Cost + Target Profit}}{\textbf{Unit Produced}}$$

$$= \frac{861000 + 5096000}{161000}$$

= Rs: 37 Per Unit

IMPORTANT POINTS IN EACH PAST PAPERS

ATTEMPT = [AUTUMN – 2012]

Q # 1(b):

Marginal revenues and marginal costs can also be calculated in this fashion at different levels of demand.

Unit	Marginal Revenue	Marginal Cost	Profit
1000	-	-	26000
1100	2 (55-53)	1 (29-28)	27500
1200	**1 (53-52)**	**1 (28-27)**	**30000**
1300	3 (52-49)	1 (27-26)	29900

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:

Efficiency Intervals	Output	Piece Rate	Total Wages	Labor Cost Per Piece
60%	48	3	168	3.5 (168/48)
70%	56	3	168	3 (168/56)
80%	64	3	192	3 (192/64)
90%	72	3.6 (3*120%)	259	3.6 (259/72)
100%	80	3.6 (3*120%)	288	3.6 (288/80)
110%	88	3.9 (3*130%)	343	3.90 (343/88)
120%	96	3.9 (3*130%)	374	3.90 (374/96)
130%	104	3.9 (3*130%)	405	3.90 (405/104)

Output will be calculated as follows:

100 ⟹ 80

60 ⟹ ?

60% = 60/100*80 = 48.

70% = 70/100*80 = 56.

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:

75000/4 = 18750 + 10% = 20625/0.96 * 3 = 64453.

Q # 4:

EPR will be calculated as follows = WIP % * Completion %

50% * 40%	20%
20% * 30%	6%
30% * 24.5%	7.35%
	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 = $\frac{\text{Cost of purchase * closing stock}}{\text{Purchases}}$

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.

Total	Transfer + WIP + Normal Loss
664500	Transfer + 24000 + Normal Loss
664500 – 24000	Transfer + Normal Loss
640500	Transfer + Normal Loss
105%	100 % + 5%
Transfer to next deptt	640500 * 100/105 = 610000
Normal Loss of deptt – A	640500 * 5/105 = 30500

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:

Standard Qty (unit made * per hr)	XXX
Add – Adverse Material Usage Variance (Variance /30)	XXX
Less – Favorable Material Usage Variance (Variance /30)	XXX
Add – Closing FG (Standard Qty * days given /365)	XXX
Less – Opening FG (Standard Qty * days given /365)	XXX

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:

SALES	X	Y	Z
Refined	6	5.50	7
Unrefined	2.50	2.75	4

ACCOUNTING TREATMENT: When two revenue figures are given in the question, we will incremental revenue.

SALES	X	Y	Z
Refined	6	5.50	7
Unrefined	2.50	2.75	4
Incremental Revenue	**3.5**	**2.75**	**3**

EXAM RUBRIC:

	Pentagon	Hexagon	Octagon
Sales price per unit (Rs.)	2300	1550	2000
Material cost per Kg. (Rs.)	250	250	250
Labour time per unit (Minutes)	20	30	45
Machine time per unit (Hours)	4	2.5	3
Net weight per unit of finished product (Kg.)	6	4	5
Yield (%)	90	95	92
Estimated demand (Units)	10000	20000	9000

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:

	Pentagon	Hexagon	Octagon
Material Cost (Material cost per kg * Net Weight / Yield)	250*6/0.90 = 1666.67	250*4/0.95 = 1052.63	250*5/0.92 = 1358.70
Labour Cost	15000/200 = 75 * 20/60 = 25	15000/200 = 75 *30/60 = 37.5	15000/200 = 75*45/60 = 56.25
Variable FOH (see box below for calculation)	133.33	85.33	121.74

Variable FOH calculation:

Total Overhead = Fixed FOH + Variable FOH	
20% of Material = Fixed FOH + Variable FOH	
FOR PENTAGON:	1666.67*20% → 333.33 =333.33 – 200 (5000000/100000*4) = 133.33
FOR HEXAGON:	1052.63*20% → 210.53 =210.53 – 125 (5000000/100000*2.5) = 85.53
FOR OCTAGON:	1666.67*20% → 271.74 =271.74 – 150 (5000000/100000*3) = 121.74

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.

EXAM RUBRIC:

	2006	2007
Production	175000	225000
Total Costs	11900000	16518600

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.

	Production	Total Costs
2007	225000	14364000
2006	175000	11900000
Difference	**50000**	**2464000**

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:

$$BEP = \frac{\text{FIXED COSTS}}{\text{C/M * individual ratio}}$$

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*S = 1100*4400 + 1595000+ (1100*S) * 10%

1100 S = 4840000 + 1595000 + 110S

1100 S – 110 S = 6435000

S = 6435000 / 990

S = 6500 units

ENTRIES

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:

Number of employees	=	180
Standard working hours (9 hours/day)	=	54
Standard hours per unit (at 100% efficiency)	=	3
Standard labour rate per hour (Rupees)	=	30

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.

FOH

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

AC/MC

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

Material Code	Yearly Usage	Unit Cost	Total Cost
TX01	10000	0.50	5000
TX02	7100	0.65	4615
TX03	2000	2.50	5000
TX04	5250	2.00	10500
TX05	6000	1.75	10500
TX06	2750	0.80	2200
TX07	1500	1.00	1500
TX08	5500	1.85	10175

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

Material Code	Yearly Usage	Unit Cost	Total Cost
TX03	2000	2.50	5000
TX04	5250	2.00	10500
A	**7250 (18.08%)**		**15500 (31.31%)**
TX05	6000	1.75	10500
TX07	1500	1.00	1500
TX08	5500	1.85	10175
B	**20250 (50.49%)**		**37675 (76.12%)**
TX06	2750	0.80	2200
TX01	10000	0.50	5000
TX02	7100	0.65	4615
C	**40100 (100%)**		**49490 (100%)**

EXAM RUBRIC: Reconcile the physical inventory balances with the balances as per book.

ACCOUNTING TREATMENT:

Opening balance (Opening Balance + Receipts – Issue)	XXX
Less – Contamination	(XXX)
Add – Not included in Books	XXX
Add – Return by production Deptt	XXX
Less – Wrong Recording	(XXX)
Add – Held on behalf of customer	XXX
Physical Balance	**XXX**

BUDGET

EXAM RUBRIC:

Sales	Rs. '000
Actual:	
January 2012	85000
February 2012	95000
Forecast:	
March 2012	55000
April 2012	60000
May 2012	65000
June 2012	75000

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:

Term	Meaning
Now	Current Period
First Month	Next Month
2nd Month	Subsequent Next Month

Sales will be calculated as follows:

	March	April	May
January (85000*80%*40%)	27200	-	-
February (95000*80%*60%)	45600	-	-
February (95000*80%*40%)	-	30400	-
March (55000*80%*60%)	-	26400	-
March (55000*80%*40%)	-	-	17600
April (60000*80%*60%)	-	-	28800
Cash Sales	11000	12000	13000
Total Sales	**83800**	**68800**	**59400**

Credit Sales rule is as follows:

January	February + March
February	March + April
March	April + May
April	May + June

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