

Material B	20000 units
Materials on order:	
Material A	7000 Units
Material B	11000 units
The desirable closing balances at the end of the next year:	
Finished product	7000 units
Material A	15000 units
Material B	25000 units
Material on order:	
Material A	8000 units
Material B	10000 units

Ans: Units to be procured A 1,30,000 B 2,14,000

12. A company is drawing its production plan for the year 2007–08 in respect of two of its products 'Gamma' and 'Delta'. The company's policy is not to carry any closing WIP at the end of any month. However, its policy is to hold a closing stock of finished goods at 50% of the anticipated quantity of sales of the succeeding month. For the year 2007–08 the company's budgeted production is 20000 units of 'Gamma' and 25000 units of 'Delta'. The following is the estimated cost data:

Particulars	Gamma Rs	Delta Rs
Direct Materials per unit	50	80
Direct Labour per unit	20	30
Other Manufacturing Expenses apportionable to each type of product based on production	200,000	375,000

The estimated units to be sold in the first 7 months of the year 2007–08 are as under:

Particulars	April	May	June	July	Aug.	Sept.	Oct.
Gamma	900	1,100	1,400	1,800	2,200	2,200	1,800
Delta	2,900	2,900	2,500	2,100	1,700	1,700	1,900

You are required to

- prepare a production budget showing month-wise number of units to be manufactured;
- present a summarised production cost budget for the half-year ending 30.9.2007. *(ICWA Inter)*

Ans: Budgeted production Gamma total 10050 units
Delta total 13300 units, total production cost
Gamma Rs. 8,04,000 Delta Rs. 16,62,500

13. Gama Engineering Company Limited manufactures two products X and Y. An estimate of the number of units expected to be sold in the first seven months of 2001 is given below:

	Product X	Product Y
January 2001	500	1400
February	600	1400
March	800	1200
April	1000	1000
May	1200	800
June	1200	800
July	1000	900

It is anticipated that:

- There will be no work-in-progress at the end of any month; and
- Finished units equal to half and anticipated sales for the next month will be in stock at the end of each month (including December 2000).

940 Cost Accounting

The budgeted production and production costs for the year ending 31st December, 2001 are as follows:

	<i>Product X</i>	<i>Product Y</i>
Production (units)	11000	12000
Direct materials per unit (Rs)	12	19
Direct wages per unit (Rs)	5	7
Direct manufacturing charges apportionable to each type of product (Rs)	33,000	48,000

You are required to prepare:

- A production budget showing the number of units to be manufactured each month.
- A summarised production cost budget for the six-month period January to June 2001.

Ans:

	X	Y
Total production units	5550	6350
Total cost	1,11,000	1,90,500

14. The following are the estimated sales of a company for eight months ending 30.11.2008:

<i>Months</i>	<i>Estimated Sales (units)</i>
April 2008	12000
May 2008	13000
June 2008	9000
July 2008	8000
August 2008	10000
September 2008	12000
October 2008	14000
November 2008	12000

As a matter of policy, the company maintains the closing balance of finished goods and raw materials as follows:

Stock item	Closing balance of a month
Finished goods	50% of the estimated sales for the next month
Raw materials	Estimated consumption for the next month.

Every unit of production requires 2 kg of raw material costing Rs 5 per kg.

Prepare Production Budget (in units) and Raw Material Purchase Budget (in units and cost) of the company for the half year ending 30 September, 2008. (ICWA Inter)

Ans: Production budget units 65,000

Raw material purchase budget Rate Rs. 5, Cost Rs. 6,55,000

15. The following are the details of the budgeted and the actual cost in a factory for six months from January to June 2002. From the figures given below you are required to prepare the production cost budget for the period from January to June 2003.

	<i>January-June 2002</i>	
	<i>Budget</i>	<i>Actual</i>
Production (units)	20000	18000
Material cost	Rs. 40,00,000 (2000 tonne @ Rs. 2,000)	39,90,000 (@ Rs. 2,100)
Labour cost	Rs. 8,00,000 (@ Rs. 20 per hour)	Rs. 7,99,920 (@ Rs. 22 per hour)
Variable overheads	Rs. 2,40,000	Rs. 2,16,000
Fixed overheads	Rs. 4,00,000	Rs. 4,20,000

a cost centre is guided by a cost variance equal to the difference between the actual and budgeted costs for a given period. Cost centre managers have control over some or all of the costs in their segment of business, but not over revenues. Cost centres are widely used forms of responsibility centres. In manufacturing organisations, the production and service departments are classified as cost centres. Also, a marketing department, a sales region or a single sales representative can be defined as a cost centre. Cost centre managers are responsible for the costs that are controllable by them and their subordinates. However, which costs should be charged to cost centres, is an important question in evaluating cost centre managers.

Revenue Centre

A revenue centre is a segment of the organisation which is primarily responsible for generating sales revenue. A revenue centre manager does not possess control over cost, investment in assets, but usually has control over some of the expenses of the marketing department. The performance of a revenue centre is evaluated by comparing the actual revenue with budgeted revenue. The Marketing Manager of a product line, or an individual sales representative are examples of revenue centres.

Profit Centre

A profit centre is a segment of organisation for which both revenue and costs are accumulated. The main purpose of profit centre is to earn profit. Profit centre managers aim at both the production and marketing of a product. The performance of the profit centre is evaluated in terms of whether the centre has achieved its budgeted profit. A division of the company which produces and markets the products may be called a profit centre. Such a divisional manager determines the selling price, marketing programmes and production policies. Profit centres make managers more concerned with finding ways to increase the centre's revenue by increasing production or improving distribution methods.

Investment Centre

As investment centre is responsible for both profits and investments. The investment centre manager has control over revenues, expenses and the amounts invested in the centre's assets. He also formulates the credit policy which has a direct influence on debt collection, and the inventory policy which determines the investment in inventory.

MEANING OF RESPONSIBILITY ACCOUNTING

The term 'responsibility accounting' refers to the accounting process that reports how well managers (of responsibility centres) have fulfilled their responsibility. Also known as activity or profitability accounting, it is an information system that personalises control reports by accumulating and reporting cost and revenue information according to defined responsibility areas within a company. According to Horngreen¹, the responsibility accounting system recognises various division centres throughout an organisation and traces costs (as well as revenue, assets, and liabilities, where relevant) to the individual managers who are primarily responsible for making decisions about these variables. The responsibility accounting system makes the following important assumptions:

1. The areas of responsibility are defined for which managers should be held responsible.
2. Managers are only charged with the items and responsibility over which they can exercise a significant degree of direct control.

¹ Charles T. Horngreen, *Cost Accounting, A Managerial Emphasis*, Prentice Hall of India.

3. Managers should actively participate in establishing the goals or budgets against which their performance is measured.
4. Goals defined for each area of responsibility should be attainable with efficient and effective performance.
5. Control (performance) reports should contain significant information related to each area of responsibility.
6. Responsibility centre managers should try to accomplish the budgets and objectives established for their respective areas of responsibility.

MEASURING DIVISIONAL PERFORMANCE

Performance measurement is aimed in respect of all responsibility divisions. The following techniques can be used to measure the performance of a division.

1. *Variance Analysis* In this technique standard costs and budgets are set in order to provide a basis for comparison with actual performance. Any variance between the two requires that corrective actions should be taken. The performance of cost centre and revenue centre is measured in terms of standard costs and budgets determined for the respective centres. On measuring the performance, attempts are made to minimise the costs of cost centre and increase the revenue of the revenue centre.

2. *Profit* This measure can be used to judge the performance of a profit centre. Besides, budgetary control and contribution to sales (c/s ratio) can be applied for measuring profit centre's performance. However there is difficulty in measuring profit of a division as net profit is equal to divisional revenue minus total costs. Total costs include direct divisional costs plus allocated fixed costs and this raises the question of finding a suitable cost allocation method. Hence, the determination of divisional profit, that is, its performance, can itself be unreliable if it includes a part of indirect cost.

It is suggested that while measuring the performance of a profit division, it is better to use a measure of divisional revenue less divisional costs and a divisional revenue less divisional controllable costs should be used to measure the performance of divisional manager. Controllable profit (divisional revenue-divisional controllable costs) is a much better measure of divisional manager's performance as it considers all costs—fixed or variable—which are within his control. The full cost can be suitable to measure a division's performance but not the performance of a divisional manager because then he is held responsible for some costs (allocated fixed costs) which is not controllable by him and which he cannot influence directly or indirectly.

3. *Return on investment (ROI)* This measure expresses divisional profit as a percentage of the firm's investment in the division and is similar to widely accepted 'return on capital employed' method. This is calculated as:

$$\text{ROI} = \frac{\text{Divisional Profit}}{\text{Divisional Investment}}$$

The ROI ratio can be divided into other ratios such as net profit margin and the asset turnover. The net profit margin is the result of firm's pricing policy and its cost control. The asset turnover shows the amount of sales generated by the capital available and whether a firm has over- or under-utilised its assets.

$$\text{ROI} = \frac{\text{Net profit}}{\text{Sales}} \times 100 \times \frac{\text{Sales}}{\text{Capital employed}} \times 100$$

(Net profit margin) (Asset turnover)

The ROI formula recognises that the absolute size of divisional operating profit alone does not provide a basis for measuring its performance, but rather the relation between the division's net income and the assets used in the generation of that income. For example, the fact that division A has net income of Rs. 50,000 does not necessarily mean that it was more successful than Division B which has profit of Rs. 40,000. The difference between these profit levels could be attributable entirely to a difference in the investment size of divisions. In such a situation, ROI proves to be a good measure of performance of a division. For example, assuming that the investments in division A and B are Rs. 2,00,000 and Rs. 1,00,000 respectively, the ROI can better indicate their comparative performances.

$$\text{ROI} = \frac{\text{Divisional Profit}}{\text{Divisional Investment}}$$

$$\text{Division A} = \frac{\text{Rs. } 50,000}{2,00,000} = 25\%$$

$$\text{Division B} = \frac{\text{Rs. } 40,000}{1,00,000} = 40\%$$

Thus, using ROI, it is proved that Division B is more efficient and has made more profit than Division A. ROI can be increased by any of the following actions, all other factors remaining constant.

1. An increase in sales price or sales volume.
2. A decrease in operating costs (fixed or variable).
3. A reduction in divisional investment.

ROI has the following advantages:

1. It relates net income to investments made in a division giving a better measure of divisional profitability.
2. It can be used as a basis for other ratios which are useful for analytical purposes.
3. It is easy to understand as it is based on financial accounting measurements.
4. It may be used for interfirm comparisons, provided that the firms whose results are being compared are of comparable size and of the same industry.

ROI has the following limitations:

1. Satisfactory definition of profit and investment are difficult to find. Profit has many concepts such as profit before interest and tax, profit after interest and tax, controllable profit, profit after deducting all allocated fixed costs. Similarly, the term investment may have many connotations such as gross book value, net book value, historical cost of assets, current cost of assets, assets including or excluding intangible assets.
2. While comparing ROI of different companies it is necessary that the companies use similar accounting policies and methods in respect of valuation of stocks, valuation of fixed assets; apportionment of overheads, treatment of research and development expenditure etc.
3. ROI may influence a divisional manager to select investments with high rates of return (that is rates which are in line or above his target ROI). Other investments that would reduce the division's ROI but could increase the value of the business may be rejected by the divisional manager. These types of decision are sub-optimal and can distort an enterprise's overall allocation of resources and may motivate a manager for under investing in order to preserve his ROI. Suppose a division's ROI is 25% as shown below.

$$\text{ROI} = \frac{\text{Profit Rs. } 1,00,000}{\text{Investment Rs. } 4,00,000} \times 100 = 25\%$$

Suppose there is an opportunity to make additional investment of Rs. 2,00,000 which will give 20% ROI. This investment is acceptable to the company because the company requires a minimum 15% ROI for this type of investment. This investment lowers the division's ROI to 23.3% calculated as follows:

Old investment + New investment

$$\text{New ROI} = \frac{\text{Rs. 1,00,000} + \text{Rs. 40,000}}{\text{Rs. 4,00,000} + \text{Rs. 2,00,000}} \times 100 = 23.3\%$$

A comparison of old ROI (25%) with the new ROI (23.3%) would imply that performance has declined. Consequently, a divisional manager might decide not to make such an investment.

4. *Residual income (RI)* Residual income can be defined as the net income of a division, less the 'imputed' capital charge on the assets used by the division. The capital charge is the minimum acceptable rate of return and is calculated by applying this required (or target) rate of return to the division's investment base. Theoretically, rate of return should be the division's cost of capital, in most cases, however it is a cut-off rate based on the firm's objectives and strategies. RI is calculated as:

$$\text{RI} = \text{Divisional profit} - (\text{Percent capital charge} \times \text{Divisional investment})$$

The 'divisional profit' and 'divisional investment' are as they are defined in ROI. Using the data given in the above example, that is, divisional profit Rs. 1,00,000, investment Rs. 4,00,000 and further assuming capital charge of 15%, the RI will be Rs. 40,000, calculated as follows:

$$\begin{aligned} \text{RI} &= \text{Rs. 1,00,000} - (15\% \times \text{Rs. 4,00,000}) \\ &= 1,00,000 - 60,000 \\ &= \text{Rs. 40,000} \end{aligned}$$

Residual income from the additional investment of Rs. 2,00,000 will be

$$\begin{aligned} \text{RI} &= \text{Rs. 40,000} - (15\% \times \text{Rs. 2,00,000}) \\ &= \text{Rs. 10,000} \end{aligned}$$

Therefore, after making additional investment, the total residual income of the division will be Rs. 50,000, that is,

$$\begin{aligned} \text{RI} &= \text{Profits } 1,00,000 + 40,000 - (15\% \times \text{Rs. 4,00,000} + 2,00,000) \\ &= 1,40,000 - 90,000 \\ &= \text{Rs. 50,000} \end{aligned}$$

Thus, the additional investment increases residual income, appropriately improving the measure of performance, whereas the use of ROI has worsened the measure of performance as it gives an overall lower ROI.

RI has following advantages:

1. It avoids sub optimal decisions as investment are not rejected merely because they lower the divisional manager's ROI.
2. It maximises growth of the company and increases shareholders' wealth by accepting opportunities which earn a rate of return in excess of the cost of capital.
3. The cost of capital charge on divisional investments ensures that divisional managers are aware of the opportunity cost of funds.
4. Charging each division with the company's cost of capital ensures that decisions taken by different divisions are compatible with the interests of organisation as a whole.

The following are the weaknesses of RI:

1. Like ROI, it is difficult to have satisfactory definition of 'divisional profit' and 'divisional investment'.
2. It may be difficult to calculate an accurate cost of capital.
3. Identifying controllable and uncontrollable factors at divisional level may be difficult.

Example 21.1

Division A and B are both considering an outlay on new investment projects.

	<i>Division A</i>	<i>Division B</i>
Investment outlay	Rs. 1,00,000	Rs. 1,00,000
Net return on the new investment	Rs. 16,000	Rs. 11,000
Current ROI	18%	11%

The company's cost of capital is 13%. Should the project be accepted or rejected?

Solution:

(i) Using ROI

$$\text{ROI on New investment} = \frac{\text{Net return}}{\text{New investment}}$$

$$\text{Division A} = \frac{\text{Rs. 16,000}}{\text{Rs. 1,00,000}} \times 100 = 16\%$$

$$\text{Division B} = \frac{\text{Rs. 11,000}}{\text{Rs. 1,00,000}} \times 100 = 11\%$$

Division A should reject the new investment as its ROI is 16% which is less than the current ROI of 18%. Division B can accept the investment as its current ROI of 11% is equal to new ROI on new investments.

(ii) Using RI

	<i>Division A</i>	<i>Division B</i>
Investment	Rs. 1,00,000	Rs. 1,00,000
Net income on new investment	16,000	11,000
Less: Imputed cost of capital 13%	13,000	13,000
Residual Income	<u>3,000</u>	<u>(2,000)</u>

Division A should accept the investment as it will make RI of Rs. 3,000 and Division B should reject it because it will give a loss of Rs. 2,000.

Example 21.2

The following information relates to budgeted operations of Division X of a manufacturing company.

	(Rs.)
Sales (50000 units at Rs. 8)	4,00,000
Less: Variable costs @ Rs. 6 per unit	3,00,000
Contribution margin	<u>1,00,000</u>
Less: Fixed costs	75,000
Divisional profit	<u>25,000</u>

The amount of divisional investment is Rs. 1,50,000 and the minimum desired rate of return on the investment is the cost of capital of 20%.

Required:

- (i) Calculate divisional expected ROI
- (ii) Calculate divisional expected RI
- (iii) Comment on the result of (i) and (ii)
- (iv) The divisional manager has the opportunity to sell 10,000 units at Rs. 7.50 per unit. Variable cost per unit would be the same as budgeted, but fixed costs would increase by Rs. 5,000. Additional investment of Rs. 20,000 would also be required. If the manager accepts the special order, by how much and in what direction would his residual income change?

Solution:

- (i)
$$\text{ROI} = \frac{\text{Rs. } 25,000}{\text{Rs. } 1,50,000} \times 100 = 16.7\%$$
- (ii)
$$\begin{aligned} \text{RI} &= \text{Divisional profit} - \text{Minimum desired rate of return} \\ &= \text{Rs. } 25,000 - (20\% \times \text{Rs. } 1,50,000) \\ &= 25,000 - 30,000 \\ \text{RI} &= (\text{Rs. } 5,000) \end{aligned}$$
- (iii) The desired rate of return is 20% but the division X is expecting to achieve an ROI of 16.7%. The expected profit of Rs. 25,000 is less than the Rs. 30,000 minimum return required, resulting in the negative of Rs. 5,000 residual income.
- (iv) Opportunity to sell additional 10,000 units

	<i>Original budget (Rs.)</i>	<i>Additional budget (Rs.)</i>	<i>Total (Rs.)</i>
Sales	4,00,000	75,000	4,75,000
Less: Variable costs	3,00,000	60,000	3,60,000
Contribution	1,00,000	15,000	1,15,000
Less: Fixed costs	75,000	5,000	80,000
Divisional profit	25,000	10,000	35,000
Less: Cost of capital (20%)	30,000	4,000	34,000
Residual Income	(5,000)	6,000	1,000

The target residual income changes from a negative balance of Rs. 5,000 to a positive one of Rs. 1,000 as a result of the new opportunity to sell 10,000 units. This is due to the fact that Rs. 10,000 expected profit from additional order is offset by a further Rs. 4,000 cost of capital, thereby increasing residual income by Rs. 6,000.

Example 21.3

XYZ company has three divisions whose income statements and balance sheets are summarised below:

	<i>Division X</i>	<i>Division Y</i>	<i>Division Z</i>
Sales (Rs.)	5,00,000	(d)	(g)
Operating income (Rs.)	25,000	30,000	(h)
Operating assets (Rs.)	1,00,000	(e)	2,50,000
Turnover	(a)	(f)	0.4
Margin	(b)	0.4%	5%
ROI	(c)	2%	(i)

Required:

- (i) Supply the missing data in the Table above and summarise the results.
- (ii) Comment on the relative performance of each division. What questions can be raised as a result of their performance?

Solution:

- (i) Return of Investment (ROI) is

$$\frac{\text{Operating income}}{\text{Operating assets}} = \frac{\text{Operating income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Operating assets}}$$

$$= \text{Margin} \times \text{Turnover}$$

(a) Division \times Turnover $= \frac{5,00,000}{1,00,000} = 5$ times

(b) Division \times Margin $= \frac{25,000}{5,00,000} = 5\%$

(c) Division \times ROI $= \text{Turnover} \times \text{Margin}$
 $= 5 \text{ Times} \times 5\%$
 $= 25\%$

- (d) Division Y Sales

Margin = 0.4% $= 0.004 = \frac{30,000}{\text{Sales d}}$

$$d = \frac{30,000}{.004} = \text{Rs. } 75,00,000$$

- (e) Division Y operating assets

$$\text{ROI} = \frac{\text{Operating income}}{\text{Operating assets}}$$

$$2\% = \frac{30,000}{\text{Operating assets}}$$

$$e = \frac{30,000}{.02} = \text{Rs. } 15,00,000$$

- (f) Division Y Turnover

$$= \frac{\text{Sales}}{\text{Operating assets}}$$

$$= \frac{75,00,000}{15,00,000} = 5 \text{ times}$$

(g) Division Z Sales

$$\text{Turnover} = \frac{\text{Sales}}{\text{Operating assets}}$$

$$0.4 = \frac{\text{Sales } g}{2,50,000}$$

$$g = 4 \times 2,50,000 = \text{Rs. } 1,00,000$$

(h) Division Z operating income

$$\text{Margin} = \frac{\text{Operating income}}{\text{Sales}}$$

$$5\% = \frac{h}{10,00,000}$$

$$h = 1,00,000 \times 5\% = \text{Rs. } 5,000$$

(i) ROI Division Z

$$= \text{Turnover} \times \text{Margin}$$

$$= 0.4 \times 5\%$$

$$= 2\% \text{ or } \frac{5,000}{2,50,000} = 2\%$$

Summarising the results:

	<i>Div. X</i>	<i>Div. Y</i>	<i>Div. Z</i>
Turnover	5 times	5 times	0.4 times
Margin	5%	0.4%	5%
ROI	25%	2%	2%

(ii) Division X performed best. It appears that Divisions Y and Z are in trouble. Division Y turns over its assets as often as Division X, but Y's margin on sales is much lower. Thus, Division Y must work on improving its margin. The following questions are raised about Division Y. Is the low margin due to inefficiency? Is it due to excessive material, labour and / or overhead costs?

Division Z, on the other hand, does just as well as Division X in terms of profit margin—both divisions earn 5% on sales. But Division Z has a much lower turnover of capital than Division X. Therefore, Division Z should take a close look at its investments. Is it too much tied up in inventories and receivables? Are there unused fixed assets? Is there idle cash sitting around?

Example 21.4

ABC is a diversified company producing and distributing different products. Product X division within the company handles a specific product and would like to earn a long-run rate of return of 20%. Product X Division will charge its unit selling price as necessary to provide this return. The following data are available on the division and its products:

Variable cost per unit	Rs. 200
Total annual fixed costs	Rs. 12,20,000
Long run normal demand	10,000 unit each year
Average operating assets owned by the division	Rs. 14,00,000

Required:

- (i) Compute the per unit selling price that will provide the desired rate of return.
- (ii) Assume that actual sales fluctuate from 8500 units to 11500 units. Compute the margin, turnover and ROI that would be realised on sales at 8500 units, 10000 units and 11500 units level of activity (use the selling price computed in part 1 for your computations).

Solution:

$$\text{ROI} = \frac{\text{Operating income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}}$$

\downarrow \downarrow
 Margin Turnover

(i) Total sales Value of 10000 units	= Rs. 20,00,000
Variable cost (Rs. 200 × 10000)	= 12,20,000
Fixed cost	
Return @ 20%	
(14,00,000 × $\frac{20}{10}$)	= 2,80,000
Total sales value	35,00,000

$$\text{Selling price per unit} = \frac{35,00,000}{10,000 \text{ units}} = \text{Rs. } 350$$

(ii) Calculation of Margin, Turnover and ROI at 8500 units

$$\begin{aligned} \text{Operating income} &= (8500 \text{ units} \times \text{Rs. } 350) - (8500 \times \text{Rs. } 200) - \text{Rs. } 12,20,000 \\ &= 29,75,000 - 17,00,000 - 12,20,000 \\ &= \text{Rs. } 55,000 \end{aligned}$$

$$\text{Margin} = \frac{55,000}{29,75,000} \times 100 = 1.85\%$$

$$\text{Turnover} = \frac{29,75,000}{14,00,000} = 2.125$$

$$\text{ROI} = \text{Margin} \times \text{Turnover}$$

$$\text{ROI} = 1.85\% \times 2.125 = 3.93\%$$

or

$$\frac{55,000}{14,00,000} \times 100 = 3.93\%$$

At 10000 units level

$$\begin{aligned} \text{Operating income} &= (10,000 \times 350) - (10,000 \times 200) - 12,20,000 \\ &= 35,00,000 - 20,00,000 - 12,20,000 \\ &= \text{Rs. } 2,80,000 \end{aligned}$$

$$\text{Margin} = \frac{2,80,000}{35,00,000} \times 100 = 8\%$$

$$\text{Turnover} = \frac{35,00,000}{14,00,000} = 2.5$$

$$\text{ROI} = 8\% \times 2.5 = 20\%$$

At 11,500 units

$$\begin{aligned} \text{Operating income} &= (11500 \times 350) - (11500 \times 200) - 12,20,000 \\ &= 40,25,000 - 23,00,000 - 12,20,000 \\ &= 5,05,000 \end{aligned}$$

$$\text{Margin} = \frac{5,05,000}{40,25,000} \times 100 = 12.25\%$$

$$\text{Turnover} = \frac{40,25,000}{14,00,000} = 2.875$$

$$\text{ROI} = 12.25\% \times 2.875 = 36.08\%$$

Summary of Calculations

Sales in units	Margin	Capital Turnover	ROI
8500	1.85%	2.125	3.93%
10000	8%	2.5	20%
11500	12.55%	2.875	36.08%

Example 21.5

Compro Electronics is facing stiff competition from imported goods. Its operating income margin has been declining steadily for the past several years; the company has been forced to lower prices so that it can maintain its market share. The operating results for the past three years as follows:

	Year 1	Year 2	Year 3
Sales	Rs. 1,00,00,000	Rs. 95,00,000	Rs. 90,00,000
Net operating income	12,00,000	10,45,000	9,45,000
Average assets	1,50,00,000	1,50,00,000	1,50,00,000

For the coming year, Compro's CEO plans to install a JIT purchasing and manufacturing system. He estimates that inventories will be reduced by 70 per cent during the first year of operations, producing a 20 per cent reduction in the average operating assets of the company, which would remain unchanged without the JIT system. He also estimates that sales and operating income will be restored to Year 1 levels because of simultaneous reductions in operating expenses and selling prices. Lower selling prices will allow Compro to expand its market share.

Required:

- Compute the ROI, margin, and turnover for years 1, 2 and 3.
- Suppose that in year 4 the sales and operating income were achieved as expected but inventories remained at the same level as in year 3. Compute the expected ROI, margin and turnover. Explain why the ROI increased over the year 3 level.

- (iii) Suppose that the sales and net operating income for year 4 remained the same as in year 3 but inventory reductions were achieved as projected. Compute the ROI, margin and turnover. Explain why the ROI exceeded the year 3 level.
- (iv) Assume that all expectations for year 4 were realized. Compute the expected ROI, margin and turnover. Explain why the ROI increased over the year 3 level.

Solution:

	Year 1	Year 2	Year 3
(i) ROI	$\frac{\text{Rs.12,00,000}}{\text{Rs.1,50,00,000}} \times 100$ = 8.00%	$\frac{\text{Rs.10,45,000}}{\text{Rs.1,50,00,000}} \times 100$ = 6.97%	$\frac{\text{Rs.9,45,000}}{\text{Rs.1,50,00,000}} \times 100$ = 6.30%
Margin	$\frac{\text{Rs.12,00,000}}{\text{Rs.1,00,00,000}} \times 100$ = 12.00%	$\frac{\text{Rs.10,45,000}}{\text{Rs.95,00,000}} \times 100$ = 11.00%	$\frac{\text{Rs.9,45,000}}{\text{Rs.90,00,000}} \times 100$ = 10.50%
Turnover	$\frac{\text{Rs.1,00,000}}{\text{Rs.1,50,00,000}} \times 100$ = 0.67	$\frac{\text{Rs.95,00,000}}{\text{Rs.1,50,00,000}} \times 100$ = 0.63	$\frac{\text{Rs.90,00,000}}{\text{Rs.1,50,00,000}} \times 100$ = 0.60

(ii)
$$\text{ROI} = \frac{\text{Rs.12,00,000}}{\text{Rs.1,50,00,000}} \times 100 = 8\%$$

$$\text{Margin} = \frac{\text{Rs.12,00,000}}{\text{Rs.1,00,00,000}} \times 100 = 12\%$$

$$\text{Turnover} = \frac{\text{Rs.1,00,00,000}}{\text{Rs.1,50,00,000}} \times 100 = 0.67$$

The ROI increased because expenses decreased and assets turned over at a higher rate (sales increased).

(iii)
$$\text{Operating assets} = \text{Rs. 1,50,00,000} \times 80\% = \text{Rs. 1,20,00,000}$$

$$\text{ROI} = \text{Rs. 9,45,000} / \text{Rs. 1,20,00,000} = \text{Rs. 7.88\%}$$

$$\text{Margin} = \text{Rs. 9,45,000} / \text{Rs. 90,00,000} = 10.5\%$$

$$\text{Turnover} = \text{Rs. 90,00,000} / \text{Rs. 1,20,00,000} = 0.75$$

The ROI increased because assets decreased.

(iv)
$$\text{ROI} = \text{Rs. 12,00,000} / \text{Rs. 1,20,00,000} = 10\%$$

$$\text{Margin} = \text{Rs. 12,00,000} / \text{Rs. 1,00,00,000} = 12\%$$

$$\text{Turnover} = \text{Rs. 1,00,00,000} / \text{Rs. 1,20,00,000} = 0.83$$

The ROI increased because expenses decreased and assets turned over at a higher rate (sales increased and the amount of assets decreased). Both margin and turnover increased.

TRANSFER PRICING

In divisionalised companies, where profit or investment centres are created, there is likely to be inter-divisional transfer of goods or services and this internal transfer create the problem of transfer pricing. A transfer price is that notional value at which goods and services are transferred between divisions in a decentralised organisation. Transfer prices are normally set for intermediate products which are goods and services that are supplied by the selling division to the buying division. The goods that are produced by the buying division and sold to the outside world are known as final products.

A question arises as to how the transfer of goods and services between divisions should be priced. The transfer prices can have impact on the evaluation of each division's performance and measures applied for such measurements of performance.

Objectives in Sound Transfer Pricing System

A question arises as to how the transfer of goods and services between divisions should be priced. The price charged to the interdivisional transfer of goods and services is revenues to the selling division and cost to the buying division. Therefore the price charged will affect the profit of both divisions; benefit (revenue) to one division can be created only at the expense of the other division. For example, the selling division will benefit from charging higher prices for such transfers of goods and services. However, for the buying division, this will result into higher costs. While determining transfer prices a number of criteria (objectives) should be fulfilled.

- (i) Transfer prices should help in the accurate measurement of divisional performance (profitability) measurement.
- (ii) Transfer prices should motivate the divisional managers into maximising the profitability of their divisions and making decisions that are in the best interests of the organisations as a whole.
- (iii) Transfer prices should ensure that divisional autonomy and authority is preserved. The main purpose of decentralisation is to enable divisional managers to exercise greater autonomy and to measure the overall results achieved on a profit centre or investment centre. It is, therefore, not proper to give divisional managers authority by one hand by placing them in charge of divisional operations and to remove that authority by dictating transfer prices that affect the performance of the division.
- (iv) Transfer prices should allow goal congruence to take place, which in effect means that the objectives of divisional managers are compatible with the objectives of overall company.
- (v) A transfer pricing system, if properly established, can check multinational companies and international groups which may try to manipulate transfer prices between countries in order to minimise the overall tax burden.

Methods of Transfer Pricing

Broadly, there are three bases available for determining transfer prices, but many options are also available within each base. These methods are:

- (1) Market-Based Price
- (2) Cost-Based Prices
 - (a) Variable cost
 - (b) Actual full cost
 - (c) Full cost plus profit margin
 - (d) Standard full cost
- (3) Negotiated Prices
- (4) Dual prices

(1) Market-Based Prices

Market price refers to a price in an intermediate market between independent buyers and sellers. When there is a competitive external market for the transferred product, market prices work well as transfer prices. When transferred goods are recorded at market prices, divisional performance is more likely to represent the real economic contribution of the division to total company profit. If the goods cannot be bought from a division within the company, the intermediate product would have to be purchased at the current market price from the outside market. Divisional profits are therefore likely to be similar to the profits that would be calculated if the divisions were separate organisations. Consequently, divisional profitability can be compared directly with the profitability of similar companies operating in the same type of business. In the market price situation, top management will not be tempted to intervene.

Market-based prices are based on opportunity costs concepts. The opportunity cost approach signals that the correct transfer price is the market price. Since the selling division can sell all that it produces at the market price, transferring internally at a lower price would make the division worse off. Similarly the buying division can always acquire the intermediate goods at the market price, so it would be unwilling to pay more for an internally transferred goods. Since the minimum transfer price for the selling division is the market price and the maximum price for the buying division is also the market price, the only possible transfer price is the market price.²

However, there are some problems using the market price approach.

Firstly, finding a competitive market price may be difficult if such a market does not exist. Catalogue price may only vaguely relate to actual sales prices. Market prices may change often.

Secondly, another problem with market prices can occur when a selling division is not operating at full capacity and can not sell all its products. To illustrate this point, assume that material used by Division A in a company are being purchased from outside market at Rs. 20 per unit. The same materials are produced by Division B. If Division B is operating is full capacity, say of 50000 units and can sell all its products to either Division A or to outside buyers, then the use of transfer price of Rs. 20 per unit (market price) has no effect on Division B's income or total company profit. Division B will earn revenue of Rs. 20 per unit on all its production and sales, regardless of who buys its product and Division A will pay Rs. 20 per unit, regardless of whether it purchases the materials from Division B or from an outside supplier. In this situation, the use of market price as the transfer price is appropriate.

However, if Division B is not operating at full capacity and unused capacity exists in that division, the use of market price may not lead to maximisation of total company profit. To illustrate this point, assume that Division B has additional unused capacity of 30,000 units and it can continue to sell only 50,000 units to outside buyers. In this situation, the transfer price should be set to motivate the manager of Division A to purchase from Division B if the variable cost per unit of product of Division B is less than the market price. If the variable costs are less than Rs. 20 per unit but the transfer price is set equal to the market price of Rs. 20, then the manager of Division A is indifferent as to whether materials are purchased from Division B or from outside suppliers, since the cost per unit to Division B would be the same, Rs. 20. Infact, there is no gain for Division A to buy materials at Rs. 20 from Division B when same materials is available in the market for Rs. 20 per unit. However, Division A's purchase of 20000 units of materials from outside suppliers at a cost of Rs. per unit would not maximise overall company profit, since this market price per unit is greater than the unit variable cost of Division B, say Rs. 10. Hence, the intracompany transfer could save the company the difference between the market price per unit and Division B's unit variable expenses that is Rs. 10 (Rs. 20 – Rs. 10). This savings of Rs. 10 per unit would add Rs. 2,00,000 (20,000 units X Rs. 10) to overall company profit.

² Don R. Hanen and Maryamne M. Mowen, *Management Accounting*, South Western Publishing Co. 1992, p. 871.

(2) Cost-Based Prices

When external markets do not exist or are not available to the company or when information about external market prices is not readily available, companies may decide to use some forms of cost-based transfer pricing system.

As stated earlier, cost-based transfer prices may be in different forms such as variable cost, actual full cost, full cost plus profit margin, standard full cost, opportunity cost.

(a) Variable Cost: Variable cost-based pricing approach is useful when the selling division is operating below capacity. The manager of the selling division will generally not like this transfer price because it yields no profit to that division. In this pricing system, only variable production costs are transferred. These costs are direct materials, direct labour and variable factory overhead. Variable cost has the major advantage of encouraging maximum profits for the entire firm. By passing only variable costs alone to the next division, production and pricing decisions are based on cost-volume-profit relationships for the firm as a whole. The obvious problem is that selling division is left holding all its fixed costs and operating expenses. That division is now a loss division, nowhere near a profit centre.³

(b) Actual Full Cost: In actual full cost approach, transfer price is based on the total product cost per unit which will include direct materials, direct labour and factory overhead. When full cost is used for transfer pricing, the selling division cannot realise a profit on the goods transferred. This may be disincentive to the selling division. Further, full cost transfer pricing can provide perverse incentives and distort performance measures. A full cost transfer price would have shutdown the chances of any negotiation between divisions about selling at transfer prices.

(c) Full Cost Plus Profit Margin: Full cost plus mark up (or profit margin) overcomes the weaknesses of full cost basis transfer pricing system. The full cost plus transfer price include the allowed cost of the item plus a mark up or other profit allowance. With such a system, the selling division obtains a profit contribution on units transferred and hence, benefits if performance is measured on the basis of divisional operating profits. However, the manager of the buying division would naturally object that his costs (and hence reported performance) are adversely affected.

The basic question in full cost plus mark up is 'what should be the percentage of mark up'. It can be suggested that the mark up percentage should cover operating expenses and provide a target return on sales or assets.

(d) Standard Costs: In actual cost approaches, there is a problem of measuring cost. Actual cost does not provide any incentive to the selling division to control cost. All product costs are transferred to the buying division. While transferring actual costs any variances or inefficiencies in the selling division are passed along to the buying division. The problem of isolating the variances that have been transferred to subsequent buyer division becomes extremely complex. To promote responsibility in the selling division and to isolate variances within divisions, standard costs are usually used as a basis for transfer pricing in cost-based systems.

Whether transferring at differential costs or full costs, standard costs, where available, are often used as the basis for the transfer. This encourages efficiency in the selling division because inefficiencies are not passed onto the buying division. Otherwise, the selling division can transfer cost inefficiencies to the buying division. Use of standard cost reduces risk to the buyer. The buyer knows that standard costs will be transferred and avoids being charged with suppliers's cost overruns.⁴

³ Lane K. Anderson and Harold M Sollenberger, *Management Accounting*. South-Western Publishing Co. 1992, p.174.

⁴ Sidney Davidson et al., *Managerial Accounting*. The Dryden Press 1988. p. 683.

(3) Negotiated Prices

Negotiated prices are generally preferred as a middle solution between market prices and cost-based prices. Under negotiated prices, the managers involved act much the same as the managers of independent companies. Negotiation strategies may be similar to those employed when trading with outside markets. If both divisions are free to deal either with each other or in the external market, the negotiated price will likely be close to the external market price. If all of a selling division's output cannot be sold in the external market (that is, a portion must be sold to the buying division), the negotiated price will likely be less than the market price and the total margin will be shared by the divisions.

Negotiated prices avoids mistrusts, bad feelings and undesirable bargaining interests among divisional managers. Also, it provides an opportunity to achieve the objectives of goal congruence, autonomy and accurate performance evaluation. The overall company is beneficiary if selling and buying divisions can agree upon some mutually transfer prices., Negotiated transfer price is considered as a vital integrating tool among divisions of a company which is necessary to achieve goal congruence. If negotiations help ensure goal congruence, top management has little temptation to intervene between divisions. The agreed prices can also be used for performance measurement without creating any friction. The use of negotiated prices is consistent with the concept of decentralised decision-making in the divisionalised firms.

However, negotiated prices have the following disadvantages:

- (1) A great deal of management effort, time and resources can be consumed in the negotiating process.
- (2) The final emerging negotiated price may depend more on the divisional manager's ability and skill to negotiate than on the other factors. Thus, performance measures will be distorted leading to incorrect evaluation of divisional performance.
- (3) One divisional manager having some private information may take advantage of another divisional manager.

(4) Dual Prices

Under dual prices of transfer pricing, selling division sells the transferred goods at a profit using full cost plus profit margin. But the transfer price for the buying division is the market price. The difference in transfer prices for the two divisions could be accounted for by a special centralised account. This system would preserve cost data for subsequent buyer departments, and would encourage internal transfers by providing a profit on such transfers for the selling divisions.

Dual prices give motivation and incentive to selling divisions as goods are transferred at a profit or mark up. Market price can be considered as the most appropriate base for the buying division. Thus dual pricing system has the function of motivating both the selling division and buying division to make decisions that are consistent with the overall goals of decentralisation—goal congruence, accurate performance measurement, autonomy, adequate motivation to divisional manager.

Example 21.6

A company has two divisions, A and B. Division A manufactures a component which is used by Division B to produce a finished product. For the next period, output and costs have been budgeted as follows:

	<i>Division A</i>	<i>Division B</i>
Component units	50,000	
Finished units	—	50,000
Total variable costs	Rs. 2,50,000	6,00,000
Fixed costs	Rs. 1,50,000	2,00,000

The fixed costs are separable for each division. You are required to advise on the transfer price to be fixed for Division A's component under the following circumstances.

- (i) Division A can sell the component in a competitive market for Rs. 10 per unit. Division B can also purchase the component from the open market at that price.
- (ii) As per the situation described in (i) above, and further assume that Division B currently buys the component from an external supplier at the market price of Rs. 10 and there is reciprocal agreement between the external supplier and another Division C, within the group. Under this agreement the external supplier agrees to buy one product unit from Division C, at a profit of Rs. 4 per unit to that division, for every component which Division B buys from the supplier.

Solution:

- (i) Transfer Price = Incremental (marginal) cost + Opportunity costs of the company due to not being able to use the components in the next most profitable way.
 = Rs. 5 + Rs. 5 (Contribution foregone by transferring internally as opposed to selling in the open market)
 = Rs. 10

The transfer price of Rs. 10 is equal to the market price of the component which is also Rs. 10.

- (ii) Transfer Price = Marginal cost + Contribution + Profit foregone by Division C as Division B will acquire its units from Division A in place of external supplier.
 = Rs. 5 + Rs. 5 + 4
 = Rs. 5 + Rs. 9 (Rs. 9 is the opportunity cost to the whole company)
 = Rs. 14

The transfer price of Rs. 14 should result in the Manager of Division B continuing to buy from the external supplier at the market price of Rs. 10. However, the transfer price of Rs. 14 is appropriate from the viewpoint of the organisation as a whole, since, if the component is transferred internally not only will Division A forgo an external profit of Rs. 5, but Division C will also forego an external profit of Rs. 4. It is assumed that Division C could not achieve the same profit by selling elsewhere.

Example 21.7

A company fixes the inter-divisional transfer prices for its products on the basis of cost plus an estimated return on investment in its divisions. The relevant portion of the budget for the Division A for the year 2007–08 is given below:

Fixed Assets	Rs. 5,00,000
Current assets (other than debtors)	3,00,000
Debtors	2,00,000
Annual Fixed Cost of the division	8,00,000
Variable cost per unit of product	10
Budgeted Volume of Production per year (units)	4,00,000
Desired Return on Investment	28%

You are required to determine the transfer price for the Division A.

Solution:

Basic Calculations:

- (i) Computation of Investment in Division A.
- | | |
|---|----------------------|
| Fixed Assets | Rs. 5,00,000 |
| Current Assets (Debtors + Other Current Assets) | <u>5,00,000</u> |
| | <u>Rs. 10,00,000</u> |

(ii) Return on Investment		
Desired Return 28% on Rs. 10,00,000		Rs. 2,80,000
Budgeted Volume of Production p.a.		4,00,000 units
Profit Margin per unit	$\frac{2,80,000}{4,00,000} =$	Re. 0.70

Computation of Transfer Price for Division A

Variable Cost per Unit	Rs. 10.00
Fixed Cost per unit $8,00,000/4,00,000$	2.00
Profit Margin per unit	.70
Transfer Price per unit	Rs. 12.70

Example 21.8

A company has two divisions, Division A and Division B. Division A normally purchase its parts from Division B of the same company. Division A has learned that Division B is increasing its price to Rs. 110 per unit. As a result, Division A manager has decided to purchase the parts from an outside supplier at a unit cost of Rs. 100, Rs. 10 less than it would cost to purchase the same part from Division B. The Division B manager has explained that inflation is the cause of the price increase and that the loss of parts normally transferred to Division A will hurt the division as well as the company profits. The Division B manager feels that the company as a whole would benefit from the sale of parts of Division A. The following costs and unit purchases represent the normal annual transaction.

	Rs.
Units purchased	1,000
Division B's variable cost per unit	95
Division B's fixed cost per unit	10

Required:

- (i) Will the company as a whole benefit if Division A purchases the unit from the outside supplier for Rs. 100 per unit? Assume that there are no alternative uses for Division B's facilities.
- (ii) What would be the effect if the outside selling price decreases by Rs. 8 per unit, assuming that Divisions B remains idle?
- (iii) If Division B's facilities could be put into production for other sales at an annual cost saving of Rs. 14,500, should Division A still purchase from the outside?

Solution:

The straightforward comparative income statement approach has been used to solve the questions:

- (i) Division A's action to purchase at Rs. 100

	Buy outside Rs.	Buy Inside Rs.
Total purchase costs	1,00,000	—
Total outlay costs	—	95,000
Net cash outflow to the company as a whole.	1,00,000	95,000

The company as a whole will benefit if Division A buys inside.

	Buy outside Rs.	Buy Inside Rs.
(ii) Total purchase costs	92,000	–
Total outlay costs	–	95,000
Net cash outflow to the company as a whole.	92,000	95,000

The company as a whole will benefit if Division A buy from the outside supplier at Rs. 92 per unit.

	Buy outside Rs.	Buy inside
(iii) Total purchase costs	1,00,000	–
Total outlay costs	–	95,000
Revenue (or cost savings) from using Division B's facilities	(14,500)	
Net cash outflow to the company as a whole	85,500	95,000

In this case, the company as a whole will be better off if Division A buys outside and Division B's facilities are utilised elsewhere.

Alternative Solution

Using opportunity cost concept, the question can be analyzed as follows:

	1	2	3
(a) Total purchase costs	1,00,000	92,000	1,00,000
Total outlay costs if purchase inside	95,000	95,000	95,000
Total opportunity costs if purchased inside	—	—	14,500
(b) Total relevant costs	95,000	95,000	1,09,500
Net advantage (disadvantage) to company as a whole (a – b)	5,000	(3000)	(9,500)

THEORY QUESTIONS

1. Explain the concept of responsibility accounting. What are the different types of responsibility centres.
2. Discuss the essential of responsibility performance reporting.
3. How will you measure the performance of cost and revenue division?
4. Distinguish between cost centre and profit centre. *(B.Com. (Hons), Delhi, 2002)*
5. Discuss responsibility accounting in brief. *(B.Com. (Hons), Delhi, 2004)*
6. What is responsibility centre? Discuss briefly the nature of various types of responsibility centres. *(B.Com. (Hons), Delhi, 2003)*
7. Write short notes on the following:
Responsibility centres-cost centre and profit centre. *(B.Com. (Hons), Delhi, 2005)*
8. Describe and compare the main performance measures that have been suggested to measure the divisional performance.
9. Profit, return on investment and residual income have stood the test of time and are widely used for measuring the performance of a division. Describe the strengths and weaknesses of these measures of performance.

10. Outline problem in defining and measuring capital employed in a division.
11. Explain the rationale of using an interest charge while measuring the performance of a division.
12. "In ROI, there is lack of consensus on the definition of numerator and denominator both." Explain the statement.
13. Explain the essential ingredients of a system of 'Responsibility Accounting'.
(B. Com. (Hons), Delhi, 1998)
14. Outline the basic principles of 'Responsibility Accounting'.
(B. Com. (Hons), Delhi, 2001)
15. What are the financial and non-financial methods of performance measurement? Explain with examples, wherever, feasible.
(B.Com. (Hons), Delhi, 2007)
16. What is meant by divisional performance measurement? Describe any two techniques used for this purpose.
(B.Com. (Hons). Delhi, 2007)
17. Discuss the important of market prices in transferring pricing system.
18. What do you mean by responsibility accounting?
19. Discuss the merits and demerits of ROI and RI for divisional performance measurement.
20. What are the objectives of transfer pricing system?
21. Explain the utility of cost-based prices under transfer pricing.
22. Write notes on (i) Negotiated prices and (ii) Dual prices.

PROBLEMS

1. Yonex India Ltd. is segmented into three divisions A, B and C. All were formed in the same year and now all assets have left exactly one-half of their expected life. Top management is attempting to determine which of the division is the most profitable. The following data have been prepared for your analysis:

	<i>Division</i>		
	<i>A</i> <i>(Rs.)</i>	<i>B</i> <i>(Rs.)</i>	<i>C</i> <i>(Rs.)</i>
Net income before taxes	78,000	90,000	96,000
Investment base-gross book value	3,90,000	5,00,000	6,00,000
Investment base-net book value	1,95,000	2,50,000	3,00,000

Prepare rankings of the three divisions using ROI and RI with a capital charge of 12.5% that each division manager might use to assert that his is the most profitable division.

Ans:

ROI	<i>Ranking</i> RI (Gross Value)	RI (Net Value)
A	A	B
B	B	C
C	C	A

2. The operating performance of the three division of ABC company for 2003 is as follows:

	<i>Division A</i> <i>(Rs.)</i>	<i>Division B</i> <i>(Rs.)</i>	<i>Division C</i> <i>(Rs.)</i>
Sales	38,00,000	1,70,00,000	2,00,00,000
Operating Profit	2,00,000	5,00,000	10,00,000
Investment	20,00,000	62,50,000	80,00,000

- (a) Using the operating profit margin percentage as the criterion, which is the most profitable division?
- (b) Using the rate of return on investment as the criterion, which is the most profitable division?
- (c) Which of the two measures do you think gives the better indication of overall operating performance? Explain your reasoning.

Ans: (a) Ranking Division A, Division C, Division B
 (b) Ranking Division C, Division A and Division B
 (c) ROI is better than operating profit margin

3. The Components Division produces a part that is used by the Goods Division. The cost of manufacturing the part is given below:

	Rs.
Direct materials	10
Direct labour	2
Variable overhead	3
Fixed overhead	5
Total cost	20

Fixed overhead is based on a practical volume at 2,00,000 parts
 Other costs incurred by the Components Division are as follows:

	Rs.
Fixed selling and administrative	5,00,000
Variable Selling	Re. 1/unit

The part usually sells for between Rs. 28 and Rs. 30 in the external market. Currently, the Components Division is selling it to external customers for Rs. 29. The division is capable of producing 200,000 units of the part per year; however, because of a weak economy, only 150,000 parts are expected to be sold during the coming year. The variable selling expenses are avoidable if the part is sold internally.

The Goods division has been buying the same part from an external supplier for Rs. 28. It expects to use 50,000 units of the part during the coming year. The manager of the Goods Division has offered to buy 50,000 units from the Components Division for Rs. 18 per unit.

Required:

- (i) Determine the minimum transfer price that the Components Division would accept.
- (ii) Determine the maximum transfer price that the manager of the goods division would pay.
- (iii) Should an internal transfer take place? Why? If you were the manager of the Components Division, would you sell the 50,000 components for Rs. 18 each? Explain.
- (iv) Suppose that the average operating assets of the Components Division total Rs. 100 lakhs, Compute the ROI for the coming year, assuming that the 50,000 units are transferred to the Goods Division for Rs. 21 each.

Ans. (i) Rs. 15, (ii) Rs. 28, (iii) Yes, because the opportunity cost of the transferring division is less than the opportunity cost of the buying division, (iv) 0.075 or 7.5%

4. Green World Company is a nursery products firm. It has three divisions that grow and sell plants: Western Division, Southern Division and Northern Division. Recently, the Southern Division of the company acquired a plastics factory that manufactures green plastic pots. These pots can be sold both externally and internally. Company policy permits each manager to decide whether to buy or sell internally. Each divisional manager is evaluated on the basis of return on investment.

The Western Division has bought its plastic pots in lots of 100 from a variety of vendors. The average price paid was Rs. 750 per box of 100 pots. However, the acquisition made Rohan, manager of the Western Division, wonder whether or not a more favourable price could be arranged. He decided to approach John Mathew, manager of the Southern Division, to see if he wanted to offer a better price for an internal transfer. Rohan suggested a transfer of 3,500 boxes. at Rs. 700 per box.

John Mathew gathered the following information regarding the cost of a box of 100 pots:

	Rs.
Direct materials	350
Direct labour	80
Variable overhead	100
Fixed overhead	100
(based on Rs. 20,00,000/20,000 boxes)	
Total unit cost	630
Selling price	750
Production capacity	20,000 boxes.

Required:

- (i) Suppose that the plastics factory is producing at capacity and can sell all that it produces to outside customers. How should John Mathew respond to Rohan's request for a lower transfer price?
- (ii) Now Assume that the plastics factory is currently selling 16,000 boxes. What are the minimum and maximum transfer prices? Should John Mathew consider the transfer at Rs. 700 per box?
- (iii) Suppose that Green World's policy is that all transfer prices be set at full cost plus 20 percent. Would the transfer take place? Why? or why not?

Ans: (i) John Mathew should not reduce the price charged to Rohan if he can sell all he produces.

(ii) Minimum transfer price Rs. 530.

Maximum transfer price Rs. 750

(iii) The transfer price will be Rs. 756. No, the transfer will not take place.

SPECIALISED TOPICS

Part 5 discusses a few specialised topics which are broadly covered in cost accounting and about which managers and cost accounting practitioners should be fully aware. Uniform costing and Inter-firm comparison, cost audit are such useful areas and have been discussed in this part.

- 22. UNIFORM COSTING AND INTER-FIRM COMPARISON
- 23. COST AUDIT

UNIFORM COSTING AND INTER-FIRM COMPARISON

Learning Objectives

After reading this chapter, you should be able to:

1. explain uniform costing, its advantages, factors for establishing a uniform costing system, its areas of uniformity;
2. describe the contents of uniform cost manual, and
3. explain the important requirements of inter-firm comparison, its benefits and limitations.

UNIFORM COSTING

Uniform costing is defined as the use by several undertakings of the same costing principles and/or practices. Uniform or identical methods may be applied by various members of a group of similar companies under common control. Sometimes trade and business associations bring uniformity in costing principles and practices among all industries. Uniform costing is not a separate method of cost accounting like process or job costing, standard costing or marginal costing. It only points to a situation where a number of business firms are applying similar costing principles and practices.

Advantages of Uniform Costing

The advantages of uniform costing may be listed as follows:

1. Small business firms are not able to maintain a full costing system as it is costly and complicated. If the business associations and federations develop some costing principles for the benefit of all business concerns, much cost likely to be incurred on designing and establishing a costing system is likely to be saved.
2. It is always possible for management to be able to compare the cost of its own business with the average costs in the industry. Comparison helps to minimise areas of inefficiencies and weaknesses.
3. Some business associations use the costs provided by the members to prepare a standard price list, the existence of which tends to reduce destructive competition and help all members to obtain at least a fair price for their goods or services.
4. The applications of uniform costing in an industry provide the means whereby relevant information can be obtained to help in negotiations with government departments, trade unions, etc.

5. When customers find that quotations are based on sound costing principles they accept them more readily, and the relationship of business enterprises with their customers is thus improved.
6. Uniform cost accounting facilitates the work of wage boards set up to fix minimum wages and fair wages for industry.
7. The benefits of research and development carried out by big firms may be made available to smaller firms also through uniform costing.
8. Uniform costing makes available cost data which are vital to government and regulatory authorities. In many areas, such as price control, protection or subsidy to industry, import licenses, quota for scarce materials, uniform costing provides suitable and important statistics.
9. Uniform costing is helpful in comparing the production efficiency of two units at the time of an amalgamation and merger.

Disadvantages

1. Business firms differ in nature of work, conditions and organisational characteristics. It becomes difficult to suggest a uniform costing for all business firms which widely differ from each other.
2. Uniform costing requires utmost cooperation, openness and confidence among members of the business and industry groups.
3. Uniform costing tends to suggest a single price within the industry which may create monopolistic tendencies.

ESTABLISHING A UNIFORM COSTING SYSTEM

Uniform costing may be useful to those business firms which are in the same industry, within a single management and also to industries of a similar nature, big or small. The success of uniform costing depends on the following factors:

1. Free exchange of ideas, information practices and techniques
2. Mutual trust, cooperation, confidence and a desire to share with each other.
3. Bigger enterprises should lend more cooperation and help to smaller enterprises.
4. No concealment of any information.
5. Absence of competition and hatred among participating members.

In uniform costing the purpose is to establish uniformity in cost accounting principles and practices and, therefore, an attempt should be made to locate differences and remove the causes creating such differences. The differences in cost accounting practices of different firms may be due to the following reasons:

- (i) *Difference in nature, size and organisational set-up of business enterprises* Managing personnel, division of labour, division of work, number and size of department, services provided, smaller firms, larger firms, salary and wage structure.
- (ii) *Methods of production* Use of plant and equipment, degree of mechanisation, manufacturing process or operation, sequence in processing.
- (iii) *Use of cost accounting principles and procedures* Different methods of pricing materials issues, methods of wage payment, classifications, apportionment and absorption of overheads, methods of depreciation, treatment of administrative and selling and distribution overheads.

AREAS OF UNIFORMITY

Uniform costing requires uniformity in cost accounting principles and procedures especially in the following areas:

1. *General classifications of accounts* Uniformity in classification and codification of accounts should be maintained.
2. *Method of overhead allotment* The basis on which the various overheads should be allotted to producing and servicing departments should be followed by all members of the industry groups using uniform costing.
3. *Method of overhead absorption* Uniformity in the method of overhead absorption is most important.
4. *Scrap and losses* The general method of treatment to be accorded to scrap and losses should be specified. The method of dealing with income from the sale of waste products should also be specified.
5. *Joint costs* The treatment of joint costs is also very important and a uniform method should be followed. It should also be decided as to which costs should or should not be included in cost.

UNIFORM COST MANUAL

The designing and applications of uniform costing require that a uniform cost manual containing instructions, clarifications, rules and guidelines about cost determination, cost analysis and cost control, should be developed and circulated among the business enterprises that have decided to use uniform costing. A uniform cost manual usually contains the following materials:

1. *Introduction* The introduction of the manual describes the statement of objectives of the system, scope of the system, advantages to be achieved and its basic features.
2. *Accounting organisation* It contains a scheme of organisation for designing and operating the cost accounting system.
3. *Accounting system* It contains general principles of accounting, a coding system, terminology, classification and description of accounts.
4. *Cost accounting system* It describes methods of costing (job, process, standard costing, etc.), system of integration in accounts, relation between cost and financial accounts, items to be included or excluded in stocks, classification of departments into producing and servicing, treatment of materials cost and materials losses, pricing of materials issues, classification of materials into direct and indirect, classification of labour cost and treatment of labour related costs such as idle time, overtime, holidays and shift allowances, etc., classification, collection, apportionment and absorption of overhead, calculation of depreciation, treatment of under- and over-absorption.
5. *Presentation of information* This section clearly describes how the cost information should be presented. It contains forms and contents of statements to be prepared, forms of reports to management, forms of report to shareholders, detailed operation and production costs, cost ratios, financial ratios and other supplementary information.

INTER-FIRM COMPARISON

Inter-firm comparison is the technique of evaluating the performance efficiencies, costs and profits of firms in an industry. Inter-firm comparison is greatly facilitated if uniform costing has been used. Inter-firm comparison requires exchanges of information relating to costs, profits, prices, efficiency on a voluntary basis among participating firms. Trade and commerce associations usually employ accountants to collect cost information about business firms and make inter-firm comparisons.

ESSENTIALS OF INTER-FIRM COMPARISON

Inter-firm comparison can succeed when uniform costing principles and procedures have been used among member business firms. The following are the important requirements of inter-firm comparison:

1. *Nature and extent of information to be accumulated* Inter-firm comparison requires that all relevant and detailed cost information should be collected regarding business firms. No definite list of information can be suggested for collection. However, the following are the usual information which are applicable to all industries and therefore can be collected for inter-firm comparison:
 - (i) Information regarding cost and cost structure.
 - (ii) Labour efficiency and labour utilisation.
 - (iii) Machine efficiency and machine utilisation.
 - (iv) Raw materials consumed, wastage and stores-keeping.
 - (v) Return on capital employed.
 - (vi) Liquidity and liquid resources.
 - (vii) Reserve and appropriation of profits.
 - (viii) Debtors and creditors.
 - (ix) Methods of production and technical aspects.
 - (x) Inventory and inventory systems.
2. *Responsibility for collection, coordination and presentation of information* In some countries separate organisations have been established for collecting and presenting information. In India inter-firm comparison information is collected by various trade associations, chambers of commerce, the National Productivity Council, research and statistics divisions of several commerce and trade journals and periodicals and newspapers.
3. *Method of collection and presentation of information* Information for the purpose of inter-firm comparison is usually supplied by business enterprises to organisation(s) regularly. Information can be collected by field workers also. After the information is collected, it is properly compiled and arranged and finally a consolidated report is prepared for the benefit of business firms. For the information to be purposeful, it is essential that participating firms should agree about the meaning of various terms used in ratios and accounting information.

BENEFITS OF INTER-FIRM COMPARISON

Inter-firm comparison has the following advantages:

1. It makes a business firm aware of its limitations as compared to other in the industry.
2. It eliminates confusion and uncertainty and encourages business firms to take some positive steps to improve performance and increase efficiency.
3. Information about the industry and business is available which is useful to present and prospective business entrepreneurs.
4. Reporting of data on business firms is generally treated free from bias.
5. Useful data about business enterprises becomes available to government for formulating economic, commercial and other policies for the well-being of the nation.

LIMITATIONS OF INTER-FIRM COMPARISON

1. Business firms may be afraid that disclosure of information may help competitors, and may thus be reluctant to part with facts which are detrimental to their interests.
2. Some managements are not convinced about the utility of inter-firm comparison.
3. If business firms have not established suitable cost accounting systems, the information supplied by them may not be usable for inter-firm comparison.
4. Business firms usually do not agree about a common suitable basis for comparison.

However, the above limitations are basically due to differences in the nature of participating business firms and use of accounting methods. Therefore, a uniform cost accounting system should be established in every participating firm and business firms should be educated about the advantages and uses of inter-firm comparison.

THEORY QUESTIONS

1. Explain the concept of "uniform costing". What is a uniform costing manual?
2. What principal factors should be considered in introducing a system of uniform costing in an industry? *(ICWA)*
3. What is a uniform cost accounting system? What are the items on which you would seek uniformity so far as overheads are concerned in a uniform cost accounting system? *(ICWA)*
4. "A scheme of inter-firm comparison combines the advantages of a uniform costing system and the benefits arising out of the use of ratios." Discuss. *(ICWA)*
5. Discuss the scope and applications of uniform costing methods and their usefulness especially in the context of the economy of our country. Assume that you are advising a trade association in this regard in the interest of its member firms and outline your views and suggestions. *(ICWA)*
6. Why is inter-firm comparison desirable? What are the essential points that should be considered in inter-firm comparison? What are its advantages.
7. What are the purpose of uniform costing when it is introduced in an industry under a federation? What are the basic requirements of uniform costing? *(ICWA Inter Dec)*
8. Explain in brief, the advantages and limitations of uniform costing. *(CA, PE, Exam II, Group II, Nov. 1999, May 2001, 2004)*
9. State the essential requirements for the installation of uniform costing system in an industry. *(CA, PE, Exam II, Group II, Nov. 2002)*

COST AUDIT

Learning Objectives

After reading this chapter, you should be able to:

1. discuss meaning and advantages of cost audit, its preparation, scope,
2. distinguish between financial and cost audit, efficiency and cost audit;
3. explain concept and scope of management audit;
4. list some important areas requiring cost reduction within the management audit;
5. describe areas of activity for which accounting records are to be maintained under Cost Accounting Record Rules, and
6. explain the concept, advantages and procedure of value analysis.

MEANING OF COST AUDIT

The Institute of Cost and Management Accountants (UK) defines cost audit “as the verification of cost accounts and a check on the adherence to the cost accounting plan.” Cost audit is verifying the correctness of cost accounts, cost reports, cost data and costing methods.

ADVANTAGES OF COST AUDIT

Cost audit is useful to many parties such as (i) management (ii) shareholder (iii) statutory auditor, (iv) government and consumers.

- (i) *Management* Cost audit adds reliability to cost statements and cost data. It helps in detection of errors, frauds and irregularities. Management can make sound decisions on the basis of correct and reliable cost data.
- (ii) *Shareholders* Cost audit increases the reliability of many cost data which are used by shareholders to analyse the financial position of a business firm.
- (iii) *Statutory Auditor* Statutory auditor is also benefitted if cost system has been set up in an organisation. The statutory auditor can determine scope of his audit and make audit programme after evaluating cost accounting system used in organisation.

- (iv) *Government and Consumers* Government needs cost data for many purposes such as fixation of prices, cost plus contract, productivity measurement, evaluation of management efficiency, week points of management and organisation. All these activities require that cost data should be correct and reliable which is possible if a good costing system has been followed in an organisation.

FINANCIAL AUDIT AND COST AUDIT

Financial audit is the audit of financial accounts whereas cost audit is the audit of cost accounts. Financial audit aims to know whether the financial statements, namely, profit and loss account and balance sheet present a true and fair view of the business result and state of affairs of a business enterprise or not. On the other hand, cost audit aims to determine the correctness of cost figures of each activity after proper analysis. Cost audit focuses on propriety of expenditure and efficiency of performance.

Financial audit is related with only historical figures and data after the expenditures have been incurred and accounts have been prepared. Cost audit is performed with the help of budgets and therefore has a futuristic focus.

EFFICIENCY AUDIT AND COST AUDIT

Efficiency audit ensures that the resources flow into the most remunerative channels, namely, (a) every rupee invested in capital or in other fields gives optimum return; and (b) the planning of investment between the different functions and aspects is designed to give optimum results. The financial auditor does not comment on the performance efficiency of the company.

Since an appraisal of the extent of efficiency of utilization of factors of production is done in cost audit, it is rightly called "efficiency audit".

The following are the evidences to prove that Cost audit is efficiency audit:

- (i) The Cost Auditor has to report in para (3) of the annexure*, the financial position of the company, giving inter alia—financial ratios like profit as % of capital, profit as % of net sales, current assets expressed as % of current liabilities, cost of production as % of capital employed, and working capital as % of cost of production. These ratios are useful for assessment of operational efficiency and comparing the financial health of one undertaking with another as well as for measurement of internal efficiency.
- (ii) The Cost Audit Report under Para 4 of the annexure reflects the installed capacity and actual capacity utilised as well as analysis of the reasons for shortfall in actual capacity utilised as compared to installed capacity.
- (iii) Under Para 6 of the annexure to Cost Audit Report, an analytical study of the consumption of raw materials per unit of production both in quantity and in value is made.
- (iv) Under Para 7, the cost auditor is expected to comment on the consumption of power and fuel in total as well as per unit of output.
- (v) The Cost Auditor has to report on the direct labour cost per unit of output of the product under cost audit alongwith brief explanation for variation in the cost, as compared to two preceding years.
- (vi) The details of expenditure under overheads, with reasons for significant variation in expenditure as compared to preceding two years, particularly increase in overhead expenditure without corresponding increase in turnover or output of the product under Cost Audit has to be commented upon in Para 11 of Annexure to Cost Audit Report;

*The Department of Company Affairs, Government of India has framed Cost Accounting Record Rules which contains format of Cost Audit Report and an Annexure containing the guidelines for preparing Cost Audit Report by the cost auditor.

- (vii) The Cost Audit Report, under Para 9, contains information regarding consumption of stores and spares parts per unit of output which serves as a good indicator of upkeep of machines;
- (viii) The Cost Audit Report contains information regarding the extent of non-moving items of stores as compared to the total inventory (vide Para 9 of Annexure to the report).
- (ix) In Para 13 of Annexure to the Cost Audit Report the profitability of other exports from the company has to be commented upon;
- (x) A cost auditor is expected to offer comments on various matters like rectification of imbalances in production facilities, fuller utilisation of installed capacities, increased productivity, limiting factors causing production bottlenecks and improved inventory policies.
- (xi) A cost auditor is also expected to offer comments on the budgetary control systems and internal audit systems, prevailing in the organisation.

Thus, it can be established that no other audit except cost audit is so well designed to bring about the efficiency aspect of operations of a manufacturing unit in such elaborate detail.

MANAGEMENT AUDIT

Management audit is a detailed and critical review of all aspects of the management. Management audit encompasses all facets of managerial operations, including internal controls, and ascertaining the extent of compliance with established policies, plans and procedures within an organisation. Management audit is sometimes known as operational audit. The basic objectives of a management audit are to:

- (i) help management to manage better;
- (ii) improve organisational profitability; and
- (iii) ensure that management objectives are being met.

The management audit covers a very vast and broad scope and extends beyond the scrutiny of books of accounts to areas such as production, maintenance, materials management, consumption of inputs, marketing, personnel matters, etc. Technical aspects are also involved.

Scope of Management Audit

Some important areas which management audit should probe to evaluate the performance efficiency to ascertain the drawbacks in the systems and procedures and to make suggestions to the management for remedial action and better control, could be the following:

- (i) Production performance; (ii) sales performance; (iii) capacity utilisation; (iv) inventory holdings; (v) liquidity position; (vi) consumption efficiencies; (vii) costs of production; (viii) preventive maintenance; (ix) idle capacity; (x) purchases; (xi) receivables; (xii) overtime; and (xiii) controllable expenses.

Potent Tool for Managerial Control

Management audit as the eyes and ears of the management can bring to focus the weak areas of the operation and bring the improvement in the operational efficiency by interaction with the functionaries and highlighting these areas to the top management for improvement in the systems, procedures and methods of internal control. It is, thus a potent tool for managerial control.

Cost Reduction through Improvement in the Performance Efficiency

Cost of production is directly related with the operational efficiency and continuous efforts to improve operational efficiency. It will result in the reduction of costs and increase in the profitability. Some important areas needing a probe and suggestions towards reduction of costs by management audit could be:

(i) Input mix and cheaper substitutes; (ii) consumption efficiencies; (iii) preventive maintenance to reduce idle capacity; (iv) utilisation and performance of plant and machinery; (v) control in inventory holdings; (vi) economic purchases; (vii) improvement of sales turnover of products having high P/V Ratio; (viii) control over recoverables; (ix) control over overtime; (x) improvement of industrial relations.

PREPARATION OF COST AUDIT

Before starting the cost audit, an auditor should acquaint himself with several factors such as the following:

1. Cost accounting system used in organisation.
2. Production methods and manufacturing processes.
3. Information about raw materials and components used in production.
4. Concessions received from government, if any.
5. Memorandum and Articles of Association and important point mentioned therein about the costing requirements.
6. Information about cost records and documents.
7. Cost Accounting Rules or Cost Accounting Manual used in the organisation.

SCOPE OF THE COST AUDIT

Cost audit covers the following important areas:

1. *Materials:* The cost auditor generally verifies the following items relating to materials:
 - (i) Goods inward procedure
 - (ii) Store-keeping arrangement.
 - (iii) Accounting for scrap, wastage, materials transfers.
 - (iv) Perpetual inventory system.
 - (v) Materials pricing methods used.
 - (vi) Adequacy of stock checking methods.
2. *Wages:*
 - (i) Documents used in preparation of payroll.
 - (ii) Wage rate changes authorisation for wage payments and overtime payments.
 - (iii) Time recording.
 - (iv) Internal check system.
3. *Overhead:*
 - (i) Classification of overhead.
 - (ii) Overhead budgets.
 - (iii) Apportionment and allocation of overhead.
 - (iv) Methods of absorption.
 - (v) Policy regarding inclusion of overhead in work-in-progress.
 - (vi) Accounting treatment of under- or over-absorption.
4. *General:*
 - (i) Methods of establishing standards, revision of standards.
 - (ii) Methods of calculating standards cost variances.
 - (iii) Accounting codes and instructions.

Areas of activity for which accounting records are to be maintained under Cost Accounting Record Rules

Costing Accounting Record Rules The Government of India had issued “Cost Accounting Record Rules” in respect of number of products/industries (as listed under Section 209 (1) (d) of Companies Act). Before the imposition of Statutory Cost Audit it was expected from all such concerns to observe these rules. Such an audit is imposed in respect of those products/industries which are consumer oriented and earners of high profit margin. According to these rules, all companies engaged in activities of production or manufacturing, etc. (for which cost account records have been prescribed) should maintain accounting records relating to the utilisation of materials, labour and other items of cost. Such books of account should facilitate the calculation and disclosure of cost of production and cost of sales of the products at a periodical intervals. Each books of account and the proforma prescribed by the rules should be completed within the prescribed time limit after the end of the relevant financial year of the company. Following records are to be maintained under Cost Accounting (Records) Rules generally applicable to various industries in India.

1. Records for raw materials, components, stores and spare parts.
2. Records for labour.
3. Records for overheads.
4. Records for utilities/services.
5. Records for fixed assets.
6. Records for packing.
7. Records for research and development expenses.
8. Records for conversion cost.
9. Records for by-products.
10. Records for work-in-progress and finished goods.
11. Records for cost of production and marketing.
12. Reconciliation of cost records with financial books.
13. Computation of variances.
14. Physical verification.
15. Statistical data.

VALUE ANALYSIS

Value analysis or value engineering is a technique applied to analyse all aspects of an existing product or component to determine the minimum cost necessary for specific function requirements. This may result in various alterations being made to the product with object of reducing costs.

Advantages of Value Analysis

The primary advantage of value analysis is reduction in product cost. Some other advantages are the following:

1. Value analysis improves sale and customer satisfaction since it determines the exact requirements of customers and product designing is done accordingly.
2. The quality of the product is improved.
3. The latest methods of production and technology are used in product manufacture.
4. By simplification and standardisation of design and method, problems and complexities in production methods are eliminated.
5. It coordinates all managerial functions and builds up a spirit of cooperation and team work.
6. It helps in accomplishing effective utilisation of production resources like capital, employees, materials, time, etc.

Procedure of Value Analysis

Value analysis basically centres around determining the essential characteristics of a product that the customer requires and determining the most economical method of producing it by balancing cost with the utility of the product. The following are the steps involved in value analysis:

1. *Collecting relevant information* All necessary information about a product is first gathered, such as physical characteristics, materials specification, product costs like materials, labour and overhead, market, competitive products, production methods, etc.
2. *Deciding alternatives* All alternatives are to be developed and the most appropriate alternative is to be decided upon in terms of suitability of method and costs involved. That alternative is considered best which gives the best satisfaction to customers and reduces the cost.
3. *Approval for the accepted alternative* Management should approve the best alternative and give authority for the development of the modified or revised product.
4. *Execution* Production drawings and models are developed and production is done accordingly.
5. *Follow-up* Finally, the extent of cost reduction that has been achieved should be investigated.

THEORY QUESTIONS

1. What are the areas of activity which a cost audit programme is expected to cover?
(ICWA Inter, June)
2. 'The statutory cost audit under the provisions of the Indian Companies Act is also intended to subserve social interests.' Comment.
(ICWA June)
3. Distinguish between:
 - (i) Cost audit and financial audit
 - (ii) Cost audit and management audit.
4. 'Cost audit is a necessity and not a luxury and is viewed as a barometer to measure the operational performance, the effectiveness of utilisation and working results.' Illustrate.
5. Explain the advantages of cost audit.
6. Is it correct to say that cost audit is efficiency audit. Give arguments.
7. Discuss the aspects usually covered in management audit.
8. What areas are covered in cost audit?
9. Explain the concept of value analysis as a technique of cost reduction.
10. Discuss the purpose of cost audit and circumstances under which a cost audit is desirable.
(CA, PE, Exam II, Group II, Nov. 2003)
11. What as a cost auditor will you verify in the area of work-in-progress?
(CA, PE, Exam II, Group II, May 2002)
12. Define cost audit. How is it useful to:
 - (i) Management
 - (ii) Society
 - (iii) Share holders
 - (iv) Government?
13. What are the areas of activity which a cost audit programme is expected to cover?
(CA, PE, Exam II, Group II, Nov. 2000)

APPENDIX

OBJECTIVE -TYPE QUESTIONS

- SECTION I: TRUE/FALSE STATEMENTS**
- SECTION II: FILL-IN-THE BLANKS**
- SECTION III: MATCHING STATEMENTS**
- SECTION IV: MULTIPLE CHOICE QUESTIONS**

SECTION I: TRUE/FALSE STATEMENTS

1. Do you agree with the following statements? If not, why?

- (a) Valuation of closing stock is same under FIFO and LIFO method.
- (b) Abnormal idle time wages is included in cost of production.
- (c) Fixed cost per unit remains constant.
- (d) A firm earns profit when contribution is equal to fixed costs under variable costing.
- (e) Bin card is same as stores ledger. (B.Com. Delhi)

Ans:

- (a) This is a **False** statement because valuation of closing stock under FIFO and LIFO is not the same. When prices are rising, the value of closing stock will be higher in FIFO method as compared to LIFO and vice-versa.
- (b) This is also a **False** statement because abnormal idle time wages is not included in cost rather it is transferred to Costing Profit and Loss Account.
- (c) This is also a **False** statement because total fixed cost remains constant but fixed cost per unit will change with any change in the volume of output.
- (d) This is also a **False** statement because when contribution is equal to fixed cost there will be no loss and no profit.
- (e) This is also a **False** statement. Bin card is not the same as stores ledger.

2. Are the following statements **True** or **False**?

- (i) Purchase order is an order to stores department to issue materials.
- (ii) Fixed costs are costs which vary with variation in input.
- (iii) Abnormal idle time wages are excluded from the cost of production.
- (iv) Manufacturing and administrative overheads are different.
- (v) Margin of safety implies 'Break-even point'. (B.Com. Delhi)

Ans:

- (i) **False** (ii) **False** (iii) **True** (iv) **True** (v) **False**

3. Are the following statements **True** or **False**? Give briefly reasons also.

- (i) The adoption of 'LIFO' method does not result in inflation of profits during periods of rising materials prices.
- (ii) Variable cost per unit does not remain constant.
- (iii) Sales above break-even point indicate profits.
- (iv) Underabsorption of overheads decreases profit in costing books. (B.Com. Delhi)

Ans:

- (i) This statement is **True** because in LIFO methods, prices of materials charged to production are the latest prices. Therefore, under periods of rising prices, prices charged will be high and profit disclosed will be lower.
- (ii) This statement is **False** because Variable cost in total varies in direct proportion to the volume of output but remains constant per unit.
- (iii) This statement is **True** because Break-even point indicates a position of no profit and no loss. It is also the point of sales after which profit begins. Thus, any sales above break-even point will indicate profit.
- (iv) This statement is **False** because under absorption of overhead has the effect of under-statement of cost and this will increase the amount of profit in costing books.

4. Are the following statements **True** or **False**?

- (i) Contribution is always equal to fixed costs.
- (ii) Good units do not bear the normal loss arising in Process Costing.
- (iii) Job Card is meant to record the attendance of workers.
- (iv) Labour Cost Card is the same thing as Job Card.

(B.Com. Delhi, 1990)

Ans:

- (i) **False** (ii) **True** (iii) **False** (iv) **False**

5. Are the following statements **True** or **False**?

- (i) On the Bin Card, number of units and their value is recorded.
- (ii) Fixed costs are costs which do not vary with variation in output.
- (iii) Job card is same as Time card.
- (iv) Good units do not bear the normal loss arising in Process Costing.

(B.Com. Delhi, 1992)

Ans:

- (i) No (ii) Yes (iii) No (iv) Yes

6. Are the following statements **True** or **False**? Give reasons for your answer.

- (i) Contribution Margin = Sales \times P/V Ratio.
- (ii) The object of preparing Cost Sheet and Production statement is the same.
- (iii) Abnormal Loss is the excess of actual material loss over the pre-determined rate of loss of material.
- (iv) FIFO method of pricing material issue results in higher profits.
- (v) Preventive Costs and Replacement Costs have inverse relationship.

(B.Com. Delhi, 1995)

Ans:

- (i) This statement is **True**. P/V ratio indicates the share of contribution in the sales.
- (ii) **True**: Cost sheet and Production statement are more or less one and the same thing.
- (iii) This statement is **True**.
- (iv) This statement is **True** in the situation of rising price.
- (v) **True**: When more costs are incurred to prevent labour turnover, lesser will be the rate of labour turnover.

7. State whether the following statements are **True** or **False**. Give reasons.

- (a) Total fixed cost remains unaffected by changes in the volume of output.
- (b) B.E.P. is the point at which total revenue is equal to total cost.
- (c) Abnormal loss is charged to Costing Profit and Loss Account.
- (d) Fringe benefits are charged to Costing Profit and Loss Account.
- (e) EOQ is that quantity which is most economical to order.

(B.Com. Delhi, 1996)

Ans:

- (a) **True**: Total fixed cost remains unaffected by change in the volume of output. But the fixed cost 'per unit' increases when the volume of output decreases, and fixed cost 'per unit' decreases when the volume of production increases.
- (b) **True**: B.E.P. is the point at which total revenue is equal to total cost. This is that level of sales where there is no profit and no loss.
- (c) **True**: Abnormal loss is charged to Costing Profit and Loss Account.
- (d) **False**: Fringe benefits are indirect forms of employee compensation. The cost of such benefits should be treated as production overheads which are allocated to various departments.
- (e) **True**: EOQ is defined as the economical purchase order size taking into account inventory carrying costs and ordering costs.

8. State whether the following statements are **True** or **False**. Give reasons.
- All the variable expenses are indirect expenses.
 - Salaries paid to salesmen come under direct cost and are included for the calculation of prime cost.
 - Bincard shows the money value of material received, issued and the balance at any point of time.
 - Loss of material due to fire is treated as overhead and included for calculating cost of production.
 - Break-even point is the point at which total revenue is equal to total cost.

(B.Com. Delhi 1998, 2003)

Ans:

- False:** Variable expenses vary proportionately with the output. Direct Material, direct wage; direct expenses, consumable stores, power, etc. are items of variable expenses. Indirect expenses, on the other hand, do not vary in direct proportion to output. It is wrong to say that all the variable expenses are indirect expenses.
 - False:** They are a part of selling and distribution overheads.
 - False:** Bin card is a record maintained in respect of each item of material to show the quantity in, the quantity out and the quantity in stock after each transaction. It does not show the money value of material received, issued and the balance at any point of time.
 - False:** It is abnormal loss and taken to the Costing Profit and Loss Account.
 - True:** Break-even point is the point at which total revenue is equal to total cost, it is the point of no profit no loss.
9. State whether the following statements are **True** or **False**. Given reasons.
- Financial accounts provide information for income determination.
 - Variable cost per unit remains fixed.
 - High Labour Turnover Ratio denotes good human relations.
 - Perpetual inventory system and continuous stock taking are synonymous.
 - Margin of safety = Break-even sale minus Fixed cost.

(B.Com. Delhi, 1999)

Ans:

- True:** Financial accounts provide information for income determination. From the information provided by the financial account, profit and loss account is prepared at the end of accounting period. It shows the income of the business during the accounting period.
 - True:** Variable cost per unit remains fixed because total variable cost increases proportionately with the increase in the output.
 - False:** High Labour Turnover Ratio denotes bad labour-management relation. It is a sign of unrest among workers.
 - False:** 'Perpetual Inventory' and 'Continuous Stock Taking' should not be considered synonymous. Perpetual inventory means the system of records, whereas continuous stock taking means the physical checking of those records with actual stocks.
 - False:** Margin of safety = Actual sales – Break-even sales
10. Are the following statements **True** or **False**? Support your answer with proper reasoning.
- Cost unit and cost centre have the same meaning.
 - The economic order quantity is the same as reorder level.
 - Cost of abnormal idle time is charged to costing profit and loss account.

- (d) Machine hour rate method of absorption of overheads can be applied in those organisations where work is done mainly on machines.
- (e) Break-even point is the point at which total revenue is equal to total cost. (*B.Com. Delhi, 2001*)

Ans:

- (a) **False:** A cost unit is a unit of quantity of product, service or time (or a combination of these) in relation to which cost may be ascertained or expressed while cost centre means a location, person or item of equipment (or group of these) for which cost may be ascertained and used for the purposes of cost control.
- (b) **False:** The quantity of material to be ordered at one time is known as economic ordering quantity. This quantity is fixed in such a manner as to minimise the cost of ordering and carrying the stock. Whereas re-ordering level is the point at which if stock of a particular material in store approaches, the storekeeper should initiate the purchase requisition for fresh supplies of that material.
- (c) **True:** It is a principle of costing that all abnormal expenses and losses should not be included in costs and as such wages paid for abnormal idle time should not form part of the cost of production. Cost of abnormal idle time is charged to costing profit and loss account.
- (d) **True:** Machine hour rate is the cost of running a machine per hour. It is one of the methods of absorbing factory expenses to production. It is used in those industries and departments where machinery is predominant and there is little or practically no manual labour.
- (e) **True:** A business is said to break-even when its total sales are equal to its total costs. It is a point of no profit and no loss. At this point, contribution is equal to fixed cost.

11. Indicate whether the following statements are **True** or **False**, giving reasons in one or two lines.

- (i) Fixed costs does not change in the same proportion in which output changes.
- (ii) According to LIFO method pricing, issues are close to current economic values.
- (iii) Perpetual inventory system means continuous stock taking.
- (iv) Waste can be realised but scrap cannot be realised.
- (v) Under the ABC analysis of materials control, A stands for the highest number of items.

(*B.Com. (Hons), Delhi 1998*)

Ans:

- (i) **True:** Fixed cost are commonly described as those which remain fixed in total amount with increase or decrease in the volume of output for a given period of time. Thus, we can say that fixed cost does not change in the same proportion in which output charges.
- (ii) **True:** According to LIFO method goods are issued on the principle of last in first out. It is **True** to say that issues are close to current economic values.
- (iii) **False:** Perpetual inventory is a system of records which reflects the physical movements of stock on the receipt and issues of material and also reflects the balance in stores. It is not a continuous stock taking system.
- (iv) **False:** It is incorrect to say that wastage can be realised and scrap cannot be realised. Scrap can also be realised.
- (v) **False:** Under the ABC analysis of material control, 'A' stands for the high value item but not for the highest number of items.

12. Indicate whether the following statements are **True** or **False**:

- (i) The rental of a car which includes a fixed daily rate plus an extra fee for each kilometre driven is an example of a step cost.
- (ii) Assuming inflation, if a company wants to maximise net income, it would select FIFO as the method of pricing raw materials.

- (iii) Overtime premium paid to all factory workers is usually considered direct labour.
- (iv) Period costs are invariable and are expended out as and when the inventory is sold.
- (v) Idle facility and idle time are the same. *(B.Com. (Hons), Delhi, 1999)*

Ans:

- (i) **False:** Rental of a car which includes a fixed daily rate plus an extra fee for each kilometre driven is not an example of step cost. It is the example of one type of semi-variable cost.
 - (ii) **True:** Profit can be maximised if a company select FIFO as the method of pricing raw material during inflation.
 - (iii) **False:** Generally speaking, payment for ordinary hours of overtime work is a part of direct labour cost. It is only the extra payment of overtime premium that needs a separate treatment in cost accounting. Hence overtime premium paid to all factory workers are not usually considered direct labour.
 - (iv) **True:** It is true that period costs are invariable and are expended out as and when the inventory is sold.
 - (v) **False:** Idle facility and idle time are not the same. Idle facility is related to the unused production potentiality whereas idle time is related to the time not utilised on production.
13. Indicate whether the following statements are **True** or **False** giving reasons in one or two lines:
- (i) A favourable variance will arise when actual revenues are less than expected.
 - (ii) A fixed cost is fixed per unit.
 - (iii) Variable costing is more widely used than Absorption costing for external reporting.
 - (iv) Cost-volume-profit relationship is a more comprehensive term than Break-even Analysis.
 - (v) All manufacturing costs are assigned to products under variable costing.

(B.Com. (Hons), Delhi, 2001)

Ans:

- (i) **True:** When actual revenues are less than the standard or expected then there will be unfavourable variance.
 - (ii) **False:** Fixed cost represents the cost which is incurred for a period, and which, within certain output and turnover limits tend to be unaffected by fluctuation in the levels of output or turnover. Fixed cost per unit changes with changes in output.
 - (iii) **True:** Absorption costing is more widely used for external reporting.
 - (iv) **True:** Cost-Volume-Profit relationship is a more comprehensive term.
 - (v) **False:** In variable costing only variable production cost are assigned to products.
14. Which of the following are **True** or **False**:
- (a) Only direct costs are relevant costs.
 - (b) Contribution is fixed cost plus profit.
 - (c) Variable cost of an output is always greater than its differential cost.
 - (d) Standard cost is always an ideal cost.
 - (e) At break-even point fixed cost is always equal to total contribution.

(B.Com. (Hons), Delhi, 2005)

Ans:

- (a) **False**, (b) **True**, (c) **False**, (d) **False**, (e) **True**.
15. State whether the following are **True** or **False**:
- (i) Time recording is not necessary for piece rate workers.
 - (ii) Centralised purchasing is always advisable in a multi-unit company.
 - (iii) Cost reduction is a never ending process while cost control has a definite goal.

- (iv) In decision making management should consider only future costs.

(ICWA (Inter), Stage I, June 2007)

Ans:

- (i) **False** (ii) **False** (iii) **True** (iv) **True**

16. State whether the following are **True** or **False**.

- (i) Notional expenses are not included for ascertaining cost.
 (ii) Merit rating is same as Job evaluation.
 (iii) A firm which has a very high current ratio and very low liquid ratio, has a low level of inventory.
 (iv) Units that do not meet production standards and must be processed further in order to be salable as good units or irregulars are called Spoiled units.
 (v) Labour cost may be viewed as a Committed cost rather than Discretionary cost.

(ICWA, Inter, Stage I, June 2006)

Ans:

- (i) **True** (ii) **False** (iii) **False** (iv) **False** (v) **True**

17. State whether the following are **True** or **False**:

- (i) Standard costing can be introduced in all types of manufacturing industries.
 (ii) Defective and spoilage mean the same for cost accounting purposes and require the same treatment.
 (iii) When a factory operates at full capacity, fixed cost also become relevant for 'Make or Buy' decisions.
 (iv) Net profit will be the same under Marginal costing and Absorption costing if no inventory exists.
 (v) Principal Budget Factor is a factor controllable by the Manager of the Budget Centre.

(ICWA, Inter, Stage I, Dec. 2006)

Ans:

- (i) **False** (ii) **False** (iii) **True** (iv) **True** (v) **False**

18. State whether the following statements are **True** or **False**:

- (i) If an expense can be identified with a specific cost unit, it is treated as direct expense.
 (ii) Time and motion study, which is a function of the engineering department, is useless for the determination of wages.
 (iii) Fixed costs vary with volume rather than time.
 (iv) The relationship of value function and cost can be expressed as:

$$\text{Cost} = \frac{\text{Value}}{\text{Function}}$$

 (v) Future costs are not relevant while making management decisions.
 (vi) In break-even analysis it is assumed that variable costs fluctuate inversely with volume.

(ICWA, Inter, Stage I, June 2005)

Ans:

- (i) **True** (ii) **False** (iii) **False** (iv) **False** (v) **False** (vi) **False**

19. State whether the following are **True** or **False**.

- (i) Variable Cost varies with time.
 (ii) ABC analysis is based on the unit price of materials.
 (iii) Cenvat credit is allowed on the basis of Central Excise Gate Pass.

- (iv) Differential Costing and Marginal Costing mean the same thing.
- (v) Integral accounts merge financial and cost accounts in one set of accounts.

(ICWA, Inter, Stage 1, Dec. 2005)

Ans:

- (i) **False** (ii) **False** (iii) **True** (iv) **False** (v) **True**.

20. State whether the following statements are **True** or **False**.

- (i) Marginal costing is useful for long term planning.
- (ii) Standards are arrived at based on past performance.
- (iii) Cost of floppy disc used for office computer is administration overhead.
- (iv) Opportunity cost is the value of benefit sacrificed in favour of an alternative course of action.
- (v) Bin cards show quantity and value of stores.
- (vi) A production order is an order received from a customer.
- (vii) LIFO method of pricing issues is useful during periods of inflation.
- (viii) Obsolete stocks can be determined by the frequency of issues.

(ICWA, Inter, Stage 1, Dec. 2003)

Ans:

- (i) **False** (ii) **False** (iii) **True** (iv) **True** (v) **False** (vi) **False** (vii) **True** (viii) **False**

21. State whether the following statements are **True** or **False**. Give reasons for your answer.

- (i) Depreciation is an out of pocket cost.
- (ii) Labour cost can be reduced by recruiting cheap labour.
- (iii) Factory overhead costs are always indirect manufacturing cost.
- (iv) A process costing system would be more appropriate than job order costing for an oil refinery.

(B.Com. Delhi, 2007)

Ans:

- (i) **False:** Out-of-pocket costs means the present or future cash expenditure regarding a certain decision which will vary depending upon the nature of decision made. Depreciation is not a cash expenditure hence it is not out of pocket cost.
- (ii) **False:** Labour cost can not be reduced by recruiting cheap labour. The Labour cost can be reduced by successful utilisation of Labour force. Skill of Labour helps in lowering down the cost besides raising the Quantity and quality of the output.
- (iii) **True:** Factory overhead means indirect material, indirect Labour and indirect expenses used in manufacturing the product.
- (iv) **True:** Job costing is used where the production is not highly repetitive and, in addition, consist of different jobs or lots so that material and labour cost can be identified by order number. But in case of oil refinery the oil passes through different stages, each distinct and well-defined and it is desired to know the cost of production at each stage and hence process costing is more suitable.

SECTION II : FILL IN THE BLANKS

1. Complete the following statements:

- (a) If sales are Rs. 50,000 and P/V Ratio is 30%, Variable cost would be _____.
- (b) Fuel and Power is an item of _____ overhead.
- (c) Variable cost per unit remains _____ with changes in the level of output.
- (d) If the rate of labour turnover high, this is sign of _____ of labour.
- (e) ABC analysis is a technique of _____.

(B.Com. Delhi, 1991)

Ans:

- (a) Rs. 35,000
- (b) Fuel and power is fixed overhead. It is an indirect expenses.
- (c) Changing
- (d) Instability
- (e) Material Control.

2. Fill in the blanks:

- (i) The technique and process of ascertaining cost is termed as _____.
- (ii) Opportunity cost helps in _____.
- (iii) _____ is used for issuing materials to the production department.
- (iv) Direct material is a _____ cost.
- (v) LIFO method of pricing material issues is suitable for _____ materials.
- (vi) Material losses may be normal or _____.
- (vii) Spoilage involves besides loss of materials, loss of _____.
- (viii) Taylor's differential plan provides for _____ rates.
- (ix) Charging to a cost centre those overheads that result only from the existence of the cost centre is known as _____.
- (x) Abnormal loss is charged to _____.

(B.Com. Delhi, 2004)

Ans:

- (i) Costing. (ii) Decision making. (iii) Material requisition note (iv) Direct or Variable
- (v) Rising price (vi) Abnormal (vii) Labour and manufacturing/Factory overheads (viii) two piece. (ix) Allocation of overheads (x) Costing Profit and Loss Account.

3. Complete the following statements:

- (i) Total fixed cost remains constant in _____.
- (ii) Unit variable cost remains constant _____.
- (iii) If the rate of labour turnover is high, this is a sign of _____.
- (iv) When the amount of overhead absorbed is less than the actual amount of overheads it is known as _____ of overheads.

(B.Com, Delhi 2007)

Ans:

- (i) change in volume of output upto certain extent
- (ii) with the change in the level of output
- (iii) Instability
- (iv) underabsorption

4. Fill in the blanks correctly.

- (i) Work study consists of _____ and _____.
- (ii) Two methods used for calculation of equivalent production are _____ and _____.

- (iii) Two ratios used to assess the liquidity of a firm are _____ and _____.
- (iv) Economic Batch Quantity depends on _____ and _____ costs.
- (v) Normal idle time cost should be charged to _____ while that due to abnormal reasons should be charged as _____.
- (vi) Flexible budget recognises the difference between _____ and _____.

(ICWA, Inter, Stage 1, June 2004)

Ans:

- (i) method study, time and motion study
- (ii) FIFO, average method
- (iii) current ratio, liquidity ratio
- (iv) set up costs, storage
- (v) production overhead, Costing Profit and Loss Account
- (vi) variable, fixed costs

5. Fill in the blanks suitably:

- (i) Two broad methods of costing are _____ and _____.
- (ii) A cost, which does not involve any cash out flow is called _____ or _____.
- (iii) Reorder level is _____ multiplied by _____.
- (iv) The normal value of current ratio is _____ and that of quick ratio is _____.
- (v) Margin of safety is _____ or _____.
- (vi) Material usage variance is the sum of _____ and _____.

(ICWA, Stage 1, Dec. 2004)

Ans:

- (i) Specific order Costing, Operation Costing
- (ii) Notional Cost, Imputed Cost
- (iii) Maximum usage, Maximum lead period
- (iv) 2, 1
- (v) Sales minus B.E. sales, $\frac{\text{Profit}}{C/S}$
- (vi) Mix variance, Yield variance

6. Fill in the blanks correctly:

- (i) _____ cost is the difference in total cost that results from two alternative courses of action.
- (ii) The most powerful tool used to analyse and interpret the health of an enterprise is _____.
- (iii) Under _____ plan employees receive a constant portion of value added.
- (iv) Idle time variance is always _____.
- (v) Generally an item of expense, when identified with a specific cost until is treated as _____.
- (vi) Contribution earned after reaching BEP is _____ of the firm.
- (vii) In 'make or buy' decisions, it is profitable to buy from outside only when the suppliers price is below the firm's own _____.

(ICWA, Inter, Stage 1, Dec. 2003)

Ans:

- (i) Differential
- (ii) ratio analysis
- (iii) Ruckev
- (iv) Adverse
- (v) Direct expense
- (vi) Profit
- (vii) Variable cost

SECTION III : MATCHING STATEMENTS

1. Match the following correctly.

- | | | |
|--------------------------------|---|--|
| (i) Perpetual Inventory System | : | Continuous physical verification |
| (ii) Standard Costing | : | Cost ascertainment |
| (iii) Value Engineering | : | Recording stock balance after every transaction |
| (iv) Blanket rate | : | Analysing the contribution of each part |
| (v) Margin of safety | : | Management by exception |
| | : | Profit made above break-even level |
| | : | Analysing the role of every part at the design stage |
| | : | Overhead recovery rate |
| | : | Sales minus break-even sales |

(ICWA, Inter, Stage 1, June 2007)

Ans:

- | | | |
|--------------------------------|---|--|
| (i) Perpetual Inventory System | : | Recording stock balance after every transaction |
| (ii) Standard Costing | : | Management by exception |
| (iii) Value Engineering | : | Analysing the role of every part at the design stage |
| (iv) Blanket rate | : | Overhead recovery rate |
| (v) Margin of safety | : | Sales minus break-even sales |

2. Match the following correctly.

- | | |
|------------------------|----------------------------|
| 'Make or buy' decision | Overhead absorption |
| Brick making | Process costing |
| Motion Study | Work study |
| Supplementary rate | Gilbreth |
| Split-off point | Single output costing |
| | Differential cost analysis |
| | Joint Cost |

(ICWA, Inter, Stage 1, June 2006)

Ans:

- | | |
|------------------------|----------------------------|
| 'Make or buy' decision | Differential Cost analysis |
| Brick making | Single output costing |
| Motion study | Gilbreth |
| Supplementary rate | Overhead absorption |
| Split-off point | Joint cost |

3. Match the following correctly.

- | | | |
|------------------------|---|--|
| (i) Opportunity Cost | : | Financial forecasting and planning |
| (ii) Variance Analysis | : | Standard measure of work to be done in one hour. |
| (iii) Ratio Analysis | : | Decision making |
| (iv) Relevant Cost | : | Value of benefit lost by choosing alternative course of action |
| (v) Standard hour | : | Management by exception |
| | : | Measure of time taken for work done. |
| | : | Cost of alternative course of action. |
| | : | Flow of funds. |

(ICWA, Inter, Stage 1, Dec. 2006)

Ans:

- | | | |
|----------------------|---|---|
| (i) Opportunity Cost | : | Value of benefit lost by choosing alternative course of action. |
|----------------------|---|---|

- | | | |
|------------------------|---|--|
| (ii) Variance Analysis | : | Management by exception |
| (iii) Ratio Analysis | : | Financial forecasting and planning. |
| (iv) Relevant Cost | : | Decision making |
| (v) Standard hour | : | Standard measure of work to be done in one hour. |

4. Match the following correctly with what it relates.

- | | |
|-------------------|---|
| Uniform costing | Supervisor's salaries |
| Variance analysis | Decision making |
| Point rating | Design of the product |
| Liquidity | Technique to assist inter-firm comparison |
| Value engineering | Job evaluation |
| Stepped cost | Engineered cost |
| | Management by exception |
| | Quick ratio |
| | Method of costing |

(ICWA, Inter, Stage 1, June 2005)

Ans:

- | | |
|-------------------|---|
| Uniform Costing | Technique to assist-inter-firm comparison |
| Variance Analysis | Management by exception |
| Point Rating | Job evaluation |
| Liquidity | Quick ratio |
| Value Engineering | Design of the product |
| Stepped Cost | Supervisor's salaries |

5. Match the following correctly.

- | | |
|----------------------------|-------------------------------------|
| Scatter Diagram | Production Order |
| Escalator Clause | Reverse Cost Method |
| Perpetual Inventory | Splitting of Semi-variable Costs |
| Material Requisition | Contract Costing |
| By-product Cost accounting | Method of maintaining Store records |
| | Purchase Order |

(ICWA, Inter, Stage 1, Dec. 2005)

Ans:

- | | |
|----------------------------|-------------------------------------|
| Scatter Diagram | Splitting of Semi-variable costs |
| Escalator Clause | Contract Costing |
| Perpetual Inventory | Method of maintaining store records |
| Material Requisition | Production order |
| By-product Cost Accounting | Reverse cost method |

6. Match the following correctly.

- | | |
|-----------------------------|--|
| Relevant costs | Helps in financial forecasting and planning |
| Primary packing materials | Practical capacity |
| Subsidised canteen facility | Indirect materials |
| Normal capacity | Control of inventory |
| Ratio analysis | Long-term average capacity based on sales expectancy |
| JIT system | Value analysis |

Future costs affected by decisions taken
Direct materials
Non-monetary incentive

(ICWA, Inter, Stage 1, June 2004)

Ans:

Relevant costs
Primary packing materials
Subsidised canteen facility
Normal capacity
Ratio analysis
JIT system

Future costs affected by decisions taken
Direct materials
Non-monetary incentive
Long-term average capacity based on sales expectancy
Helps in financial forecasting and planning
Control of inventory.

7. Match the following correctly.

Pareto distribution
Angle of incidence
Standard costing
Electricity undertaking
Direct materials
Telephone charges

Cost reduction
Semi-variable cost
Engineered cost
Profit earning capacity
Cost control
Operating costing
Margin of safety
ABC analysis
Relevant cost

(ICWA, Stage 1, Dec. 2004)

Ans:

Pareto distribution
Angle of incidence
Standard costing
Electricity undertaking
Direct materials
Telephone charges

ABC analysis
Profit earning capacity
Cost control
Operating costing
Engineered cost
Semi-variable cost

8. Match the following.

- (i) Total fixed cost
- (ii) Total variable cost
- (iii) Unit variable cost
- (iv) Unit fixed cost
- (v) Standard cost
- (vi) Period cost
- (vii) Actual cost
- (viii) Labour and overhead
- (ix) Incremental cost
- (x) Budgeted cost

What cost should be
Incurred cost
Increases with output
Cost of conversion
What cost are expected to be
Decreases with rise in output
Remains constant in total
Remains constant per unit
Cost not assigned to product
Added value of a new product

(B.Com. (Hans), Delhi.2003)

Ans:

- (i) Total fixed cost
- (ii) Total variable cost

Remains constant in total
Increases with output

(iii)	Unit variable cost	Remains constant per unit
(iv)	Unit fixed cost	Decreases with rise in output
(v)	Standard cost	What cost should be
(vi)	Period cost	Cost not assigned to product
(vii)	Actual cost	Incurred cost
(viii)	Labour and overhead	Cost of conversion
(ix)	Incremental cost	Added value of a new product
(x)	Budgeted cost	What cost are expected to be

SECTION IV : MULTIPLE CHOICE QUESTIONS

The test consists of 10 multiple choice questions. Each question has four possible answers. Only one answer is correct.

Read each question carefully. Circle the letter of the correct answer.

Write the letter of the correct answer in the space provided.

1. Which of the following is a characteristic of a solid?

- A. It has a definite shape and volume.
- B. It has a definite shape but no definite volume.
- C. It has no definite shape or volume.
- D. It has a definite volume but no definite shape.

2. Which of the following is a characteristic of a liquid?

- A. It has a definite shape and volume.
- B. It has a definite shape but no definite volume.
- C. It has no definite shape or volume.
- D. It has a definite volume but no definite shape.

3. Which of the following is a characteristic of a gas?

- A. It has a definite shape and volume.
- B. It has a definite shape but no definite volume.
- C. It has no definite shape or volume.
- D. It has a definite volume but no definite shape.

4. Which of the following is a characteristic of a plasma?

- A. It has a definite shape and volume.
- B. It has a definite shape but no definite volume.
- C. It has no definite shape or volume.
- D. It has a definite volume but no definite shape.

5. Which of the following is a characteristic of a mixture?

- A. It has a definite shape and volume.
- B. It has a definite shape but no definite volume.
- C. It has no definite shape or volume.
- D. It has a definite volume but no definite shape.

6. Which of the following is a characteristic of a compound?

- A. It has a definite shape and volume.
- B. It has a definite shape but no definite volume.
- C. It has no definite shape or volume.
- D. It has a definite volume but no definite shape.

7. Which of the following is a characteristic of an element?

- A. It has a definite shape and volume.
- B. It has a definite shape but no definite volume.
- C. It has no definite shape or volume.
- D. It has a definite volume but no definite shape.

8. Which of the following is a characteristic of a mixture?

- A. It has a definite shape and volume.
- B. It has a definite shape but no definite volume.
- C. It has no definite shape or volume.
- D. It has a definite volume but no definite shape.

9. Which of the following is a characteristic of a compound?

- A. It has a definite shape and volume.
- B. It has a definite shape but no definite volume.
- C. It has no definite shape or volume.
- D. It has a definite volume but no definite shape.

10. Which of the following is a characteristic of an element?

- A. It has a definite shape and volume.
- B. It has a definite shape but no definite volume.
- C. It has no definite shape or volume.
- D. It has a definite volume but no definite shape.

Select the correct answer from the following multiple choice questions.

1. (i) Which costing method is currently widely used for internal reporting?
 - (a) Full or Absorption costing
 - (b) Marginal costing
 - (c) Direct costing
 - (d) Standard costing
- (ii) Cost-volume-profit analysis is based on several assumptions. Which of the following is not one of these assumptions?
 - (a) The sales-mix of the products is constant;
 - (b) Inventory quantities change during the year;
 - (c) The behaviour of both revenues and cost is linear throughout the relevant range;
 - (d) Factor prices, for example, material prices and wage rates remain unchanged.
- (iii) Which of the following should not be considered in a make or buy decision?
 - (a) Potential use of manufacturing capacity;
 - (b) Variable costs of production;
 - (c) Potential rental income from space occupied by production area;
 - (d) Unchanged fixed cost.
- (iv) A company uses several types of materials to manufacture its product. The result of combining these materials in proportions different from standard proportions is the
 - (a) Material price variance;
 - (b) Material usage variance;
 - (c) Material mix variance;
 - (d) Material yield variance.
- (v) Managers who are concerned not only with cost management but also with revenue generation and with investment decisions in a responsibility centre level called of an
 - (a) profit centre
 - (b) investment centre
 - (c) expense centre

(B.Com. (Hons), Delhi, 2004)

Ans:

- (i) Standard costing
 - (ii) Inventory quantities change during the year
 - (iii) Unchanged fixed costs
 - (iv) Material mix variance
 - (v) Investment centre
2. Choose the correct answer from the answer given for each of the following. Indicate workings briefly:
- (i) The set up cost of a machine is Rs. 120. A certain order requires 9000 components to be made in the machine for execution of the order. Cost of production of the component is Rs. 40 each at it requires 15% of the cost for storing it for a year. Then the Economic Batch quantity is _____ units.
 - (a) 300
 - (b) 250
 - (c) 400
 - (d) 600

- (ii) The cost per unit of a product manufactured in a factory amounts to Rs. 160 (75% variable) when production is 10000 units, when production increases by 25% the cost of production will be Rs. _____ per unit.
- (a) 145
(b) 152
(c) 150
(d) 140
- (iii) The budgeted standard hours of a factory is 12000. The capacity utilisation ratio for April 2007, stood at 90% while the efficiency ratio for the month came to 120%. The actual production in standard hours for April, 2007 was _____.
- (a) 10800
(b) 12960
(c) 14400
(d) 12800
- (iv) In a mill number of employees at the beginning and end of a period were 2486 and 2334 respectively. During the period, 320 workers left the mills while 168 persons joined in service. Labour turnover rate as per Flux method will be _____.
- (a) 8.22%
(b) 9.46%
(c) 10.12%
(d) none of the above.
- (v) In two consecutive periods, sales and profit were Rs. 1,60,000 and Rs. 8,000 respectively in the first period and Rs. 1,80,000 and Rs. 14,000 respectively during the second period. If there is no change in fixed cost between the two periods then P/V ratio must be _____.
- (a) 20%
(b) 25%
(c) 30%
(d) 40%

(ICWA, Inter, Stage 1, June 2007)

Ans:

- (i) 600 units

$$\begin{aligned} \text{EOQ} &= \sqrt{\frac{2 \times \text{Setup cost per batch} \times \text{Annual demand}}{\text{Annual storage cost of one unit}}} \\ &= \sqrt{\frac{2 \times 120 \times 9000}{40 \times 15\%}} = 600 \end{aligned}$$

- (ii) Rs. 152

Variable cost per unit = (Rs. 160 × 75%) = Rs. 120

Fixed cost per unit = (Rs. 160 – Rs. 120) = Rs. 40

Hence, total fixed cost = 10,000 × Rs. 40 = Rs. 4,00,000

$$\begin{aligned} \therefore \text{Total cost when production is 12500 units is Rs. } & 120 + \frac{4,00,000}{12500} \\ & = \text{Rs. } 120 + 32 = \text{Rs. } 152 \end{aligned}$$

(iii) 12,960

$$\text{Efficiency ratio} = \frac{\text{Actual production in standard hours}}{\text{Actual hours taken}}$$

$$\text{Capacity utilisation ratio} = \frac{\text{Actual hours}}{\text{Budgeted hours}} = \frac{\text{Actual hours}}{12000} = 0.9$$

$$\therefore \text{Actual hours} = 10800$$

$$\text{Efficiency ratio} = \frac{\text{Actual production in standard hours}}{10800} = 1.2$$

$$\therefore \text{Actual production} = 10800 \times 1.2 = 12960$$

(iv) 10.12%

$$\text{Labour turn over} = \frac{\frac{1}{2} (\text{No. of separations} + \text{replacements})}{\text{Average No. of employees}}$$

$$= \frac{\frac{1}{2} (320 + 168)}{2410} \times 100 = 10.12\%$$

(v) 30%

$$\text{Sales} = \frac{\text{Fixed cost} + \text{Profit}}{\frac{\text{Contribution}}{\text{Sales}}} \left(\begin{array}{l} \text{where, P/V Ratio} = \frac{\text{Sales} - \text{Variable Cost}}{\text{Sales}} \\ \text{Sales} - \text{Variable Cost} = \text{Contribution} \end{array} \right)$$

$$\text{For Period I, } \frac{F + 8,000}{\frac{C}{S}} = 1,60,000$$

$$\text{For Period II, } \frac{F + 14,000}{\frac{C}{S}} = 1,80,000 \quad \frac{\text{Change in Profit}}{\text{Change in Sales}} = \text{P/V Ratio}$$

$$\text{Subtracting,} \quad \text{P/V Ratio} = \frac{14,000 - 8,000}{1,80,000 - 1,60,000} = \frac{6,000}{20,000}$$

$$\frac{6000}{\frac{C}{S}} = 20,000 \quad = 0.30 \text{ is } 30\%$$

$$\therefore \frac{C}{S} = 30\%$$

3. In the following cases one of the answers is correct. Choose the correct answer and give your working/ reasons briefly.
- (i) Tom Company Ltd. has Sales of Rs. 200,000 with variable expenses of Rs. 150,000. Would Tom Company have to increase its Sales in order to achieve an operating income of 10% of Sales?
- (a) Rs. 4,00,000
 (b) Rs. 2,51,000
 (c) Rs. 2,31,000
 (d) Rs. 2,00,000
- (ii) Warfield Company having net working Capital of Rs. 3 lakh has the current ratio of 1.8 and liquid ratio of 1.6. Its value of Stock is
- (a) Rs. 55,000
 (b) Rs. 65,000
 (c) Rs. 75,000
 (d) Rs. 85,000
- (iii) In a factory of ZB Ltd. operating standard cost system, 2,000 kg of a material @ Rs. 12 per kg were used for a product, resulting in price variance of Rs. 6,000 (FAV) and usage variance of Rs. 3,000 (Adv.) Then standard material cost of actual production was
- (a) Rs. 24,000
 (b) Rs. 27,000
 (c) Rs. 30,000
 (d) Rs. 33,000
- (iv) The standard time required per unit of a product is 20 minutes. In a day of 8 working hours a worker gives an output of 30 units. If he gets a time rate of Rs. 20 his earnings under Halsey scheme is
- (a) Rs. 200
 (b) Rs. 192
 (c) Rs. 180
 (d) Rs. 160
- (v) A manufacturer used 400 units of a Component every month and he buys them entirely from an outside supplier @ Rs. 40 per unit. The order placing and receiving cost is Rs. 100 and storage and carrying cost is 15% of the value of Stock. EOQ will be
- (a) 300 Units
 (b) 400 Units
 (c) 450 Units
 (d) 500 Units

(ICWA, Inter, Stage 1, June 2006)

Ans:

- (i) (d) Rs. 2,00,000 Let S be the proposed Sales

$$\text{So, } S \times \frac{5}{20} = \text{Rs. } 6,00,000 + 0.10 S$$

$$\text{or } 0.25 S - 0.10 S = 60,000$$

$$\therefore S = 60,000 \div 0.15 = 4,00,000$$

Hence Increase in Sales:

$$(4,00,000 - 2,00,000) = \text{Rs. } 2,00,000$$

(ii) (c) Rs. 75,000

$$\frac{CA}{CL} = 1.8 \quad CA = 1.8 CL$$

$$CA - CL = \text{Working Capital} = \text{Rs. 3 lakh}$$

$$1.8 CL - CL = 3 \text{ or } CL = \text{Rs. 3.75 lakh}$$

$$CA = 1.8 \times 3.75 = \text{Rs. 6.75 lakh}$$

$$\text{Liquid ratio} = \frac{LA}{CL} = \frac{CA - \text{Stock}}{CL} = 1.6$$

$$\begin{aligned} \text{Hence, stock} &= 6.75 - 1.6 \times 3.75 = 0.75 \text{ lakh} \\ &= \text{Rs. 75,000} \end{aligned}$$

(iii) (b) Rs. 27,000

$$\begin{aligned} \text{Total Material Cost Variance:} \\ &= \text{Material price variance} + \text{Material usage variance} \\ &= 6,000 \text{ (FAV)} + 3,000 \text{ (ADV)} = \text{Rs. 3,000 (FAV)} \end{aligned}$$

$$\text{Actual material cost} = 2,000 \times 12 = \text{Rs. 2,4000}$$

Hence, the standard material cost of Actual production

$$24,000 + 3,000 \text{ (F)} = \text{Rs. 27,000.}$$

(iv) (c) Rs. 180

Total earnings under Halsey scheme:

Time allowed for 30 units [30 × 20 minutes] = 10 hrs.

Time taken 8 hrs.

Time saved 2 hrs.

Normal wages for 8 hrs. [8 × 20] Rs. 160.00

Bonus (50% of 2 hrs. × Rs. 20) Rs. 20.00

Total Rs. 180.00

(v) (b) 400 units (EOQ)

Economic order quantity (EOQ)

$$\begin{aligned} &\sqrt{\frac{2 \times \text{Annual demand} \times \text{Ordering cost}}{\text{Storage Cost}}} \\ &= \sqrt{\frac{2 \times 400 \times 12 \times 100}{15\% \text{ of Rs. } 40}} = \sqrt{\frac{9,60,000}{6}} = 400 \text{ units} \end{aligned}$$

4. Choose the correct answer from the answers given for each of the following questions. Indicate workings briefly.

(i) A company has margin of safety of Rs. 40 lakhs and earns an annual profit of Rs. 10 lakhs. If the fixed costs amount of Rs. 20 lakhs, annual sales will be _____.

(a) Rs. 160 lakhs (b) 140 lakhs (c) Rs. 120 lakhs (d) Rs. 200 lakhs

- (ii) A chemical is manufactured by combining two standard item of input A (standard price Rs. 60/kg.) and B (Rs. 45/kg.) in the ratio 60% : 40%. Ten per cent of input is lost during processing. If during a month 1200 kg. of the chemical is produced incurring a total cost of Rs. 69,600, the total material cost variance will be_____.
- (a) Rs. 2,400 (Adv.) (b) Rs. 2,400 (Fav.) (c) Rs. 3,000 (Adv.) (d) Rs. 2,000 (Fav.)
- (iii) A factory makes use of component purchased from the market for assembling its final product, Current usage varies between 300 and 450 units per week and replenishment time is normally two weeks but can go up to five weeks. The minimum stock level of the component is _____ units.
- (a) 1,500 (b) 1,600 (c) 2,000 (d) 2,400
- (iv) In a factory where piece work system is followed with guaranteed minimum wages of Rs. 120 (for eight hours), incentive payments are made according to Rowan Bonus Scheme. The standard time per unit is 10 minutes. If in a five-day week of 40 working hours the actual production is 300 units, the total earnings of the worker is _____.
- (a) Rs. 640 (b) 720 (c) Rs. 750 (d) Rs. 800
- (v) A company has an annual sales of Rs. 120 lakhs entirely on credit. It keeps an average inventory sufficient to meet sales demand for half a month and gives its customers one month credit. Its current liabilities average Rs. 9 lakhs. The company must maintain cash (including bank balance) to have a current ratio of 2. Its cash balance will be _____.
- (a) Rs. 1 lakh (b) Rs. 2 lakhs (c) Rs. 3 lakhs (d) Rs. 4 lakhs

(ICWA, Inter, Stage 1, Dec. 2006)

Ans:

- (i) (c) $M/S = \frac{P}{C/S} = \frac{10}{C/S} = 40,$ or $C/S = 1/4$
- B.E. Sales = $\frac{F}{C/S} = \frac{20}{1/4} = 80$ Sales = $80 + 40 = 120$
- (ii) (b) A: 60 kg. @ Rs. 60 Rs. 3,600
- B: $\frac{40}{100}$ kg. @ Rs. 45 $\frac{Rs. 1,800}{Rs. 5,400}$
- Less: $\frac{10}{90}$ \therefore Std. cost of output
- $\frac{Rs. 5,400}{90} = Rs. 60/kg.$
- Material cost variance = $Rs. 1,200 \times 60 - 69,600$
= Rs. 2,400 (F)
- (iii) (a) Reorder level = Max. usage \times Max. reorder period
= $450 \times 5 = Rs. 2,250$ units
- Min. Level = Reorder level - (Normal usage \times Av. Lead time)
= $2,250 - (2 \times 375) = 1,500$ units

$$\begin{aligned} \text{(iv) (b) Rowan bonus} &= \frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time worked} \times \text{Rate} \\ &= \left(\frac{300 \times 10}{60} - 40 \right) / 50 \times 40 \times 15 = \text{Rs. 120} \end{aligned}$$

Total earning (Rs. 120 × 5) + Rs. 120 = Rs. 720

$$\text{(v) (c) Inventory} = \frac{120}{12 \times 2} = \text{Rs. 5 lakhs}$$

Average Collection Period (month) = that is, 1

∴ Debtors = 120/12 = Rs. 10 lakhs

$$\text{CL} = 9; \quad \text{Current ratio} = \frac{\text{C.A.}}{\text{CL}} = \frac{\text{CA}}{9}$$

Total current Assets = 18 lakhs Cash = Rs. 3 lakhs (bal) [18–5–10]

5. In the following cases one of the answers is correct. Choose the correct answer and give your working/reasons briefly:
- (i) The current ratio of BM Ltd. is 2 : 1 while quick ratio is 1.80 : 1. If the current liabilities are Rs. 40,000, the value of stock will be
- Rs. 6,400
 - Rs. 8,000
 - Rs. 10,000
 - Rs. 12,000
- (ii) A company maintains a margin of safety of 25% on its current sales and earns a profit of Rs. 30 lakhs per annum. If the company has a profit volume (P/V) ratio of 40%, its current sales amount to
- Rs. 200 lakhs
 - Rs. 300 lakhs
 - Rs. 325 lakhs
 - None of the above.
- (iii) In a factory of PEE Ltd. where standard costing is followed, the budgeted fixed overheads for a budgeted production of 4800 units is Rs. 24,000. For a certain period actual expenditure incurred was Rs. 22,000 resulting in a fixed overhead volume variance of Rs. 3,000 (Adv). Then actual production for the period was
- 5400 units
 - 4200 units
 - 3000 units
 - None of the above.
- (iv) ZEE Ltd. uses material—A for the production of product —M, the safety stock of material — A is 300 units; the supplier quotes a delivery delay of two or three weeks. If the company uses 500 to 800 units a week according to the activity levels, the re-order level of material — A will be
- 2300 units
 - 2400 units

- (c) 2700 units
(d) 2800 units

(ICWA, Inter, Stage 1, June 2005)

Ans:

- (i) (b) Rs. 8000: Current ratio being 2 : 1 and current liabilities (CL) being Rs. 40,000

$$\text{Current Assets} = 2 \times \text{Rs. } 40,000 = \text{Rs. } 80,000.$$

$$\text{Now, Quick ratio} = (\text{Current Assets} - \text{Stock}) / \text{CL}$$

$$1.80 = (80,000 - \text{Stock}) / 40,000$$

$$\text{Stock} = \text{Rs. } 8,000$$

- (ii) (b) Rs. 300 lakhs: Margin of safety = Profit / P/V Ratio

$$= 30 / 0.40 = \text{Rs. } 75 \text{ Lakhs}$$

$$0.25 \text{ of sales} = \text{Rs. } 75 \text{ lakhs}$$

$$\text{Hence, Sales} = 75 / 0.25 = \text{Rs. } 300 \text{ Lakhs.}$$

- (iii) (b) 4200 units: FOH Volume variance:

$$= \text{Budgeted Fixed OH} - (\text{Actual Prodn} \times \text{Std. rate})$$

$$= 24000 - (\text{Actual Prodn} \times 24000 / 4,800)$$

$$\text{Hence, } 3000 \text{ (Adv)} = 24000 - 5 \times \text{Actual Prodn}$$

$$\text{or, Actual Production} = (24000 - 3,000) / 5 = 4200 \text{ units.}$$

- (iv) (c) 2700 units: Maximum delivery period = 3 weeks

$$\text{Maximum usage} = 800 \text{ units}$$

$$\text{Safety Stock} = 300 \text{ units.}$$

$$\text{Re-order level} = \text{Safety stock} + (\text{Maximum delivery period} \times \text{Max. usage})$$

$$= 300 + (3 \times 800) = 2700 \text{ units.}$$

Ans:

- (i) Labour turnover (Flux method) is: 9.08%

$$\frac{\frac{1}{2} (\text{Separation} + \text{Replacement})}{\text{Average No. of Employees}} = \frac{\frac{1}{2} (120 + 96)}{\frac{1}{2} (1200 + 1180)} \times 100 = \frac{108}{1190} \times 100 = 9.08\%$$

- (ii) Remains the same: $\frac{\text{Contribution}}{\text{Sales}} = \frac{\text{Sales} - \text{Variable cost}}{\text{Sales}} = \text{Remains the same.}$

- (iii) Rs. 100,000

$$\text{Total Material Cost Variance} = \text{Material price variance} + \text{Material usage variance} = 4,800$$

$$\text{(A)} + 4,000 \text{ (F)} = \text{Rs. } 800 \text{ (Adv.)}$$

$$\text{Actual Material cost} = 9,600 \times 10.50 = \text{Rs. } 100,800$$

$$\text{Standard Cost of Actual production} = \text{Rs. } 100,800 - 800 = \text{Rs. } 1,00,000.$$

- (iv) 8 and 45 days.

$$\text{Debtors's turnover} = \text{Sales/Debtors} = 12,80,000 / 1,60,000 = 8$$

$$\text{Average collection period} = 360 / 8 = 45 \text{ days.}$$

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6. If actual output is lower than budgeted output, which of the following costs would you expect to be lower than the original budget?
- (a) Total variable costs
 - (b) Total fixed costs
 - (c) Variable costs per unit
 - (d) Fixed costs per unit

Ans: (a)

7. Prime cost is
- (a) All costs incurred in manufacturing a product
 - (b) Total of direct costs
 - (c) Material cost of product
 - (d) Cost of operating a department

Ans: (b)

8. A direct cost is a cost which
- (a) incurred as a direct consequence of a decision
 - (b) can be economically identified with the item being costed
 - (c) cannot be economically identified with the item being costed
 - (d) is immediately controllable
 - (e) is the responsibility of the board of directors

Ans: (b)

9. Fixed costs are conveniently deemed to be
- (a) constant per unit of output
 - (b) constant in total when production volume changes
 - (c) outside the control of management
 - (d) those unaffected by inflation

Ans: (b)

10. Which of the following is most likely to be a variable cost?
- (a) Depreciation
 - (b) Cost of material used in production
 - (c) Rent
 - (d) Advertising

Ans: (b)

11. Which of the following is most likely to be a fixed cost?
- (a) Cost of material used in production
 - (b) Rent
 - (c) Assembly labour cost
 - (d) Commissions

Ans: (b)

12. Costs incurred in the part are
- (a) Opportunity cost
 - (b) Direct cost
 - (c) Sunk costs
 - (d) Variable costs

Ans: (c)

13. The salary a student foregoes while in college is an example of

- (a) Opportunity cost
- (b) Direct costs
- (c) Sunk costs
- (d) Variable costs

Ans: (a)

14. An operation costing system is

- (a) identical to a process costing system except that actual cost is used for manufacturing overhead.
- (b) the same as a process costing system except that materials are allocated on the basis of batches of production.
- (c) the same as a job order costing system except that materials are accounted for in the same way as they are in a process costing system.
- (d) the same as a job order costing system except that no overhead allocations are made as actual costs are used throughout.
- (e) a system in which manufacturing activities are finely divided into individual, discrete steps or operations.

Ans: (b)

15. Costs are accumulated by responsibility center for control purposes when using

	<i>Job order costing</i>	<i>Process costing</i>
(a)	Yes	Yes
(b)	Yes	No
(c)	No	No
(d)	No	Yes

Ans: (a)

16. In a job cost system, manufacturing overhead is

	<i>An indirect cost of jobs</i>	<i>A necessary element in production</i>
(a)	No	Yes
(b)	No	No
(c)	Yes	Yes
(d)	Yes	No

Ans: (c)

17. A direct manufacturing labour overtime premium should be charged to a specific job when the overtime is caused by the

- (a) Increased overall level of activity.
- (b) Customer's requirement for early completion of job.
- (c) Management's failure to include the job in the production schedule.
- (d) Management's requirement that the job be completed before the annual factory vacation closure.

Ans: (b)

18. In developing a predetermined factory overhead application rate for use in a process costing system, which of the following could be used in the numerator and denominator?

<u>Numerator</u>	<u>Denominator</u>
(a) Actual factory overhead	Actual machine hours
(b) Actual factory overhead	Estimated machine hours
(c) Estimated factory overhead	Actual machine hours
(d) Estimated factory overhead	Estimated machine hours

Ans: (d)

19. A job order cost system uses a predetermined factory overhead rate based on expected volume and expected fixed cost. At the end of the year, underapplied overhead might be explained by which of the following situations?

<u>Actual volume</u>	<u>Actual fixed costs</u>
(a) Greater than expected	Greater than expected
(b) Greater than expected	Less than expected
(c) Less than expected	Greater than expected
(d) Less than expected	Less than expected

Ans: (c)

20. Companies characterised by the production of heterogeneous products will most likely use which of the following methods for the purpose of averaging costs and providing management with unit cost data?

- (a) Process costing.
- (b) Job-order costing.
- (c) Direct costing.
- (d) Absorption costing.

Ans: (b)

21. Units of production is an appropriate method of assigning overhead when

- (a) Several well-differentiated products are manufactured.
- (b) Direct labour costs are low.
- (c) Only one product is manufactured.
- (d) The manufacturing process is complex.

Ans: (c)

22. Which of the following items is not included in (charged to) factory overhead?

- (a) Factory depreciation and supplies.
- (b) Costs of service departments.
- (c) Costs of marketing departments.
- (d) Costs of maintenance departments.

Ans: (c)

23. Many companies recognise three major categories of costs of manufacturing a product. These are direct materials, direct labour and overhead. Which of the following is an overhead cost in the production of an automobile?

- (a) The cost of small tools used in mounting tires on each automobile.
- (b) The cost of the tires on each automobile.
- (c) The cost of the labourers who place tires on each automobile.
- (d) The delivery costs for the tires on each automobile.

Ans: (a)

24. Practical capacity as a plant capacity concept

- (a) Assumes all personnel and equipment will operate at peak efficiency and total plant capacity will be used.
- (b) Does not consider idle time caused by inadequate sales demand.
- (c) Includes consideration of idle time caused by both limited sales orders and human and equipment inefficiencies.
- (d) Is the production volume that is necessary to meet sales demand for the next year.

Ans: (b)

25. What are the transferred-in costs in process costing system?

- (a) Labour costs incurred for transferring employees from another department within the same plant instead of hiring temporary workers from the outside.
- (b) Costs of the product of a previous internal process that is subsequently used in a succeeding internal process.
- (c) Supervisory salaries that are transferred from an overhead cost centre to a production cost centre.
- (d) Ending work-in-process inventory of a previous process that will be used in a succeeding process.

Ans: (b)

26. The units transferred in from the first department to the second department should be included in the computation of the equivalent units for the second department under which of the following methods of process costing?

	<i>FIFO</i>	<i>Weighted-Average</i>
(a)	Yes	Yes
(b)	Yes	No
(c)	No	Yes
(d)	No	No

Ans: (a)

27. Spoilage from a manufacturing process was discovered during an inspection of work-in-process. In a process costing system, the cost of the spoilage is added to the cost of the good units produced if the spoilage is

	<i>Abnormal</i>	<i>Normal</i>
(a)	No	Yes
(b)	No	No
(c)	Yes	Yes
(d)	Yes	No

Ans: (a)

28. During the month of June Hindustan Ltd Co. experienced scrap, normal spoilage and abnormal spoilage in its manufacturing process. The cost of units produced includes

- (a) Scrap, but not spoilage.
- (b) Normal spoilage, but neither scrap nor abnormal spoilage.
- (c) Scrap and normal spoilage, but not abnormal spoilage.
- (d) Scrap, normal spoilage, and abnormal spoilage

Ans: (c)

29. Lucky Sportswear manufactures a specially line of T-shirts using a job order cost system. During March, the following costs were incurred in completing Job 2: direct materials Rs. 13,700; direct labour Rs. 4,800; administrative Rs. 1,400; and selling Rs. 5,600. Factory overhead was applied at the rate of Rs. 25 per machine hour, and Job Rs. 2 required 800 machine hours. If job Rs. 2 resulted in 7000 good shirts, the cost of good sold per unit would be

- (a) Rs. 6.50
- (b) Rs. 6.30
- (c) Rs. 6.00
- (d) Rs. 5.70
- (e) Rs. 5.50

Ans: (e)

30. A true process costing system could make use of each of the following except

- (a) Standard costs
- (b) Individual lots
- (c) Variable costing
- (d) Responsibility accounting.

Ans: (b)

31. An equivalent unit of direct materials or conversion cost is equal to

- (a) The amount of direct materials or conversion cost necessary to complete one unit of production.
- (b) A unit of work-in-process inventory.
- (c) The amount of direct materials or conversion cost necessary to start a unit of production in work-in-process.
- (d) Fifty percent of the direct materials or conversion cost of a unit of finished goods inventory (assuming a linear production pattern).

Ans: (a)

32. In the computation of manufacturing cost per equivalent unit, the weighted-average method of process costing considers

- (a) Current costs only.
- (b) Current costs plus cost of beginning work-in-process inventory.
- (c) Currents cost plus cost of ending work-in-process inventory.
- (d) Current costs minus cost of beginning work-in-process inventory.

Ans: (b)

33. Which of the following components of production are allocable as joint costs when a single manufacturing process produces several salable products?

- (a) Direct materials, direct labour, and overhead.
- (b) Direct materials and direct labour only.
- (c) Direct labour and overhead only.
- (d) Overhead and direct materials only.

Ans: (a)

34. Which of the following is/are often subject to further processing in order to be salable?

	<i>By-Products</i>	<i>Scrap</i>
(a)	No	No
(b)	No	Yes
(c)	Yes	Yes
(d)	Yes	No

Ans: (d)

35. A Co. manufactures one product with a standard direct manufacturing labour cost of four hours at Rs. 12.00 per hour. During June, 1000 units were produced using 4100 hours at Rs. 12.20 per hour. The unfavourable direct labour efficiency variance was

- (a) Rs. 1,220
- (b) Rs. 1,200
- (c) Rs. 820
- (d) Rs. 400

Ans: (b)

36. One of the purposes of standard costs is to

- (a) Simplify costing procedures and expedite cost reports.
- (b) Replace budgets and budgeting.
- (c) Serve as a basis for product costing for external reporting purposes.
- (d) Eliminate accounting for under or overapplied factory overhead at the end of the period.

Ans: (a)

37. In an income statement prepared as an internal report using the variance costing method, fixed factory overhead would

- (a) Not be used.
- (b) Be used in the computation of operating income but not in the computation of the contribution margin.
- (c) Be used in the computation of contribution margin.
- (d) Be treated the same as variable factory overhead.

Ans: (b)

38. Cost-volume-profit relationships that are curvilinear may be analysed linearly by considering only

- (a) Fixed and semi-variable costs.
- (b) Relevant fixed costs.
- (c) Relevant variable costs.
- (d) A relevant range of volume

Ans: (d)

39. Cost-volume-profit analysis assumes over the relevant range that

- (a) Total costs are linear.
- (b) Fixed costs are nonlinear.
- (c) Variable costs are nonlinear.
- (d) Selling prices are nonlinear.

Ans: (a)

40. The contribution margin increases when revenues remain the same and

- (a) Variable cost per unit decreases.
- (b) Variable cost per unit increases.
- (c) Fixed costs decrease.
- (d) Fixed costs increase.

Ans: (a)

41. Production of a special order will increase gross profit when the additional revenue from the special order is greater than
- (a) The direct materials and labour costs in producing the order.
 - (b) The fixed costs incurred in producing the order.
 - (c) The indirect costs of producing the order.
 - (d) The marginal cost of producing the order.

Ans: (d)

42. Which of the following is true concerning standard cost?
- (a) Standard costs are estimates of costs attainable only under the most ideal conditions, but rarely practicable.
 - (b) Standard costs are difficult to use with a process costing system.
 - (c) If properly used, standards can help motivate employees.
 - (d) Unfavourable variances, material in amount, should be investigated, but large favourable variances need not be investigated.

Ans: (c)

43. Which department is customarily held responsible for an unfavourable materials usage variance?
- (a) Quality control.
 - (b) Purchasing.
 - (c) Engineering.
 - (d) Production.

Ans: (d)

44. Which of the following is normally included in the financial budget of a firm?
- (a) Direct materials budget.
 - (b) Selling expense budget.
 - (c) Budgeted balance sheet.
 - (d) Sales budget.

Ans: (c)

45. A company has fixed manufacturing overhead costs totaled Rs. 1,00,000 and variable selling costs totaled Rs. 80,000. Under variable costing, how should these costs be classified?

	<i>Period Costs</i>	<i>Product Costs</i>
(a)	Re. 0	Rs. 180,000
(b)	Rs. 80,000	Rs. 100,000
(c)	Rs. 100,000	Rs. 80,000
(d)	Rs. 180,000	Re. 0

Ans: (d)

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