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LEARNING CURVE THEORY

Question 2

Explain the concept 'Learning curve'. How can it be applied for Cost management?

Answer

The first time when a new operation is performed, both the workers and the operating procedures are untried. As the operation is repeated and the workers become more familiar with work, labour efficiency increases and the labour cost per unit declines. This process continues for some time and a regular rate of decline in cost per unit can be established. This rate can be used to predict future labour costs. The learning process **starts from the point when the first unit comes out of the production line**. In other words 'Learning curve' is a function that measures how labour hours per unit decline as units of production increase because workers are learning and becoming better at their jobs.

Cost Management Application:

1. Learning curve is useful in analysing cost volume profit relationship. The company can set low price of its product to generate high demand. As the production increases, cost per unit drops.
2. It helps in budgeting and profit planning.
3. It enables the company in price fixation. In particular, the company can fix a lower price for repeat orders.
4. It helps the design engineers to take suitable decisions based on expected rates of improvement.
5. It helps in price negotiations.
6. It is useful in setting standards and in performance evaluation.

Question 4

What are the distinctive features of learning curve theory in manufacturing environment?

Explain the learning curve ratio. (Nov 2007, 9 Marks)

Answer

As the production quantity of a given item is doubled, the cost of the item decreases at a fixed rate. This phenomenon is the basic premise on which the theory of learning curve has been formulated. As the quantity produced doubles, the absolute amount of cost increase will be successively smaller but the rate of decrease will remain fixed. It **occurs due to the following** distinctive features of manufacturing environment:

- (i) Better tooling methods are developed and used.
- (ii) More productive equipments are designed and used to make the product.
- (iii) Design bugs are detected and corrected.
- (iv) Engineering changes decrease over time.
- (v) Earlier teething problems are overcome.
- (vi) Rejections and rework tend to diminish over time.

In the initial stage of a new product or a new process, the learning effect pattern is so regular that the rate of decline established at the outset can be used to predict labour cost well in advance. The effect of experience on cost is summarized in the learning curve ratio or improvement ratio.

Learning curve ratio = Average labour cost of first 2N units divided by Average labour cost of first N units. For example, if the average labour cost for the first 500 units is Rs. 25 and the average labour cost for the first 1,000 units is Rs. 20, the learning curve ratio is (Rs. 20/25) or 80%. Since the average cost per unit of 1,000 units is Rs. 20, the average cost per unit of first 2,000 units is likely to be 80% of Rs. 20 or Rs. 16.

17.6 LIMITATIONS OF LEARNING CURVE THEORY

Following limitations of learning curve must be kept in view :

1. All activities of a firm are not subject to learning effect. Following types of activities are subject to learning effect:

- (a) Those that have not been performed in this present operational mode.
- (b) Those which are being performed by new workmen, new employees or others not familiar with the particular activity. In contrast, activities being performed by experienced workmen, who are thoroughly familiar with those activities will not be subject to learning effect.
- (c) Those involving utilization of material not used by firm so far.

2. It is correct that learning effect does take place and average time taken is likely to reduce. But in practice it is highly unlikely that there will be a regular consistent rate of decrease, as exemplified earlier. Therefore any cost predictions based on conventional learning curves should be viewed with caution.

3. Considerable difficulty arises in obtaining valid data, that will form basis for computation of learning effect.

4. Even slight change in circumstances quickly renders the learning curve obsolete. While the regularity of conventional learning curves can be questioned, it would be wrong to ignore learning effect altogether in predicting future costs for decision purposes.

17.4 LEARNING CURVE EQUATION

Mathematicians have been able to express relationship in equations. The basic equation

$$Y_x = KX^s \dots (1)$$

where,

X is the cumulative number of units or lots produced

Y is the cumulative average unit cost of those units X or lots.

K is the average cost of the first unit or lot

s is the improvement exponent or the learning coefficient or the index of learning which is calculated as follows :

$s = \text{logarithm of } 2$

logarithm of learning ratio

Learning curve equation $Y_x = KX^s$ becomes a linear equation when it is written in its logarithmic form :

$$\log Y_x = \log K + s \log X \dots(2)$$

Each of the above two equations defines cumulative average cost. Either of them can be converted

to a formula for the total labour cost of all units produced up to a given point. Total cost under equation I can be found out by the following formula :

$$\text{Total cost} = \sum Y_x = \sum KX^s = K \sum X^s \dots(3)$$

SIMULATION

Question 11

- (i) What is simulation?
- (ii) What are the steps in simulation?

Answer

(i) Simulation is a quantitative procedure which describes a process by developing a model of that process and **then conducting a series of organized trial and error experiments** to product the behaviour of the process over time.

(ii) Steps in the simulation process:

- (i) Define the problem and system you intend to simulate.
- (ii) Formulate the model you intend to use.
- (iii) Test the model, compare with behaviour of the actual problem environment.
- (iv) Identify and collect data to test the model.
- (v) Run the simulation.
- (vi) Analyse the results of the simulation and, if desired, change the solution you are evaluating.
- (vii) Rerun the simulation to tests the new solution.
- (viii) Validate the simulation i.e., increase the chances of valid inferences.

Question 12

How would you use the Monte Carlo Simulation method in inventory control? (May 2008, 4 Marks)

Answer

The Monte Carlo Simulation:

It is the **earliest mathematical** Model of real situations in inventory control:

Steps involved in carrying out Monte Carlo simulation are:

- Ø Define the problem and **select the measure of effectiveness** of the problem that might be inventory shortages per period.
- Ø Identify the **variables which influence the measure of effectiveness** significantly for example, number of units in inventory.
- Ø Determine the **proper cumulative probability distribution** of each variable selected with the probability on vertical axis and the values of variables on horizontal axis.
- Ø Get a **set of random numbers**.
- Ø Consider each random number as decimal values of the cumulative probability distribution with the decimal enter the cumulative distribution plot from the vertical axis.
- Ø Project this point horizontally, until it intersects cumulative probability distribution curve.
- Ø Then project the point of intersection down into the vertical axis.

- Ø Then record the value generated into the formula derived from the chosen measure of effectiveness. Solve and record the value. This value is the measure of effectiveness for that simulated value. Repeat above steps until sample is large enough for the satisfaction of the decision maker.

Question 7

State major reasons for using simulation technique to solve a problem and also describe basic steps in a general simulation process.

Answer

Reasons:

- (i) It is not possible to develop a mathematical model and solutions without some basic assumptions.
- (ii) It may be too costly to actually observe a system.
- (iii) Sufficient time may not be available to allow the system to operate for a very long time.
- (iv) Actual operation and observation of a real system may be too disruptive.

Question 9

Write a short note on the advantages of simulation.

Answer

Advantages of simulation are enumerated below:

1. Simulation techniques allow experimentation with a model of the system rather than the actual operating system. Sometimes experimenting with the actual system itself could prove to be too costly and, in many cases too disruptive. For example, if you are comparing two ways of providing food service in a hospital, the confusion that would result from operating two different systems long enough to get valid observations might be too great. Similarly, the operation of a large computer central under a number of different operating alternatives might be too expensive to be feasible.
2. The non-technical manager can comprehend simulation more easily than a complex mathematical model. Simulation does not require simplifications and assumptions to the extent required in analytical solutions. A simulation model is easier to explain to management personnel since it is a description of the behaviour of some system or process.
3. Sometimes there is not sufficient time to allow the actual system to operate extensively. For example, if we were studying long-term trends in world population, we simply could not wait the required number of years to see results. Simulation allows the manager to incorporate time into an analysis. In a computer simulation of business operation the manager can compress the result of several years or periods into a few minutes of running time.
4. Simulation allows a user to analyze these large complex problems for which analytical results are not available. For example, in an inventory problem if the distribution for demand and lead time for an item follow a standard distribution, such as the poison distribution, then a mathematical or analytical solution can be found. However, when mathematically convenient distributions are not applicable to the problem, an analytical analysis of the problem may be impossible. A simulation model is a useful solution procedure for such problems.

CPM/PERT

Question 5

Write short notes on Distinction between PERT and CPM.

Answer

Distinction between PERT and CPM: The PERT and CPM models are similar in terms of their basic structure, rationale and mode of analysis. However, there are certain distinctions between PERT and CPM networks which are enumerated below:

(1) CPM is **activity oriented** i.e. CPM network is built on the basis of activities. Also results of various calculations are considered in terms of activities of the project.

On the other hand, PERT is **event oriented**.

(2) CPM is a **deterministic model** i.e. it does not take into account the uncertainties involved in the estimation of time for execution of a job or an activity. It completely ignores the probabilistic element of the problem. PERT, however, is a **probabilistic model**. It uses three estimates of the activity time; optimistic, pessimistic and most likely, with a view to take into account time uncertainty. Thus, the expected duration for each activity is probabilistic and expected duration indicates that there is fifty per probability of getting the job done within that time.

(3) CPM laces **dual emphasis on time and cost** and evaluates the trade-off between project cost and project item. By deploying additional resources, it allows the critical path project manager to manipulate project duration within certain limits so that project duration can be shortened at an optimal cost. On the other hand, **PERT is primarily concerned with time**. It helps the manager to schedule and coordinate various activities so that the project can be completed on scheduled time.

(4) CPM is commonly **used for those projects which are repetitive in nature** and where one has prior experience of handling similar projects. PERT is **generally used for those projects where time required to complete various activities are not known as prior**. Thus, PERT is widely used for planning and scheduling research and development project.

Question 14

What do you mean by a dummy activity? Why is it used in networking?

(May 2008, 4 Marks)

Answer

Dummy activity is a hypothetical activity which consumes no resource or time. It is represented by dotted lines and is inserted in the network to clarify an activity pattern under the following situations.

(i) To **make activities with common** starting and finishing events **distinguishable**.

(ii) To identify and maintain **the proper precedence relationship between activities** that are not connected by events.

(iii) To bring all **“loose ends” to a single initial and single terminal event**.

Question 15

What do you mean by Critical Path:

Critical Path is a chain of activities that **begin with the starting event and ends with ending event of a particular project**. It is that path that runs through a network **with the maximum length of time or it indicates the maximum possible time required for completion of a project**. Critical path indicates the minimum time that will be required to complete a project. It is determined after identifying critical events. Critical path goes through critical events.

15.7 RESOURCE SMOOTHING

It is a network technique used for smoothening peak resource requirement during different periods of the project network. Under this technique the total project duration is maintained at the minimum level. For example, if the duration of a project is 15 days, then the project duration is maintained, but the resources required for completing different activities of a project are smoothened by utilising floats available on non critical activities. These non critical activities having floats are rescheduled or shifted so that a **uniform demand on resources is achieved**. In other words, the constraint in the case of resource smoothing operation would be on the project duration time. Resource smoothing is a useful technique for business managers to estimate the total resource requirements for various project activities.

In resource smoothing, the time-scaled diagram of various activities and their floats (if any), along with resource requirements are used. The periods of maximum demand for resources are identified and non critical activities during these periods are staggered by rescheduling them according to their floats for balancing the resource requirements.

15.8 RESOURCE LEVELLING

It is also a network technique which is used for reducing the requirement of a particular resource due to its paucity. The process of resource levelling **utilize the large floats available on non-critical activities of the project and thus cuts down the demand on the resource**. In resource levelling, the maximum demand of a resource should not exceed the available limit at any point of time. In order to achieve this, non critical activities are rescheduled by utilising their floats. *Some times, the use of resource levelling may lead to enlonging the completion time of the project.* In other words, in resource levelling, constraint is on the limit of the resource availability.

TRANSPORTATION

Question 9

State the methods in which initial feasible solution can be arrived at in a transportation problem

Answer

The methods by which initial feasible solution can be arrived at in a transportation model are as under:

- (i) North West Corner Method.
- (ii) Least Cost Method
- (iii) Vogel's Approximation Method (VAM)

Question 11

How do you know whether an alternative solution exists for a transportation problem?

Answer

The Δ_{ij} matrix = $\Delta_{ij} = C_{ij} - (u_i + v_j)$

Where c_{ij} is the cost matrix and $(u_i + v_j)$ is the cell evaluation matrix for allocated cell.

The Δ_{ij} matrix has one or more 'Zero' elements, indicating that, if that cell is brought into the solution, the optional cost will not change though the allocation changes.

Thus, a 'Zero' element in the Δ_{ij} matrix reveals the possibility of an alternative solution.

Question 12

Explain the term degeneracy in a transportation problem.

Answer

If a basic feasible solution of transportation problem with m origins and n destinations has fewer than $m + n - 1$ positive x_{ij} (occupied cells) the problem is said to be a degenerate transportation problem. Such a situation may be handled by introducing an infinitesimally small allocation ϵ in the least cost and independent cell. While in the simple computation degeneracy does not cause any serious difficulty, it can cause computational problem in transportation problem. If we apply modified distribution method, then the dual variable u_i and v_j are obtained from the C_{ij} value to locate one or more C_{ij} value which should be equated to corresponding $C_{ij} + V_{ij}$.

LINEAR PROGRAMMING

Question 7

What are the *practical applications* of Linear programming?

Answer

Linear programming can be used to find optimal solutions under constraints.

In production:

- pdt. mix under capacity constraints to minimise costs/maximise profits along with marginal costing.
- Inventory management to minimise holding cost, warehousing / transporting from factories to warehouses etc.

Sensitivity Analysis: By providing a range of feasible solutions to decide on discounts on selling price, decisions to make or buy.

Blending: Optional blending of raw materials under supply constraints.

Finance: Portfolio management, interest/receivables management.

Advertisement mix: In advertising campaign – analogous to pdn. management and pdt. mix.

Assignment of personnel to jobs and resource allocation problems.

However, the validity will depend on the manager's ability to establish a proper linear relationship among variables considered.

Question 9

Explain the *concept and aim of theory of constraints*. What are the key measures of theory of constraints?

Answer

The theory of constraints focuses its attention on constraints and bottlenecks within organisation which hinder speedy production. The main concept is to maximize the rate of manufacturing output is the throughput of the organisation. This requires to examine the bottlenecks and constraints. A bottleneck is an activity within the organization where the demand for that resource is more than its capacity to supply. A constraint is a situational factor which makes the achievement of objectives / throughput more difficult than it would otherwise, for example of constraint may be lack of skilled labour, lack of customer orders, or the need to achieve high quality in product output. For example let meeting the customers' delivery schedule be a major constraint in an organisation. The bottleneck may be a certain machine in the factory. Thus bottlenecks and constraints are closely examined to increase throughput.

Key measures of theory of constraints:

(i) Throughput contribution: It is the *rate at which the system generates profits* through sales. It is defined as, sales less completely variable cost, sales – direct are excluded. Labour costs tend to be partially fixed and conferred are excluded normally.

(ii) Investments: This is the sum of material costs of direct materials, inventory, WIP, finished goods inventory, R & D costs *and costs of equipment and buildings*.

(iii) Other operating costs: This equals all operating costs (other than direct materials) incurred to earn throughput contribution. Other operating costs include salaries and wages, rent, utilities and depreciation.

Question 15

Write short notes on the characteristics of the **dual problem**.

Answer

Characteristics of the dual problem:

1. For any linear programming model called primal model, there exists a companion model called the dual model.
2. The number of constraints in the primal model equals the number of variables in the dual model.
3. The number of variables in the primal problem equals the number of constraints in the dual model.
4. If the primal model is a maximization problem then the dual model will be of the form less than or equal to, " $\leq$ " while the restrictions in the dual problem will be of the form-greater than or equal to, " $\geq$ ".
5. The solution of the primal model yields the solution of the dual model. Also, an optimal simplex table for the dual model yields the optimal solution to the primal model. Further, the objective functions of the two optimal tables will have identical values.
6. Dual of the primal's dual problem is the primal problem itself.
7. Feasible solutions to a primal and dual problem are both optimal if the complementary slackness conditions hold, that is, (value of a primal variable) $\times$ (value of the corresponding dual surplus variable) = 0 or (value of a primal slack variable) $\times$ (value of the corresponding dual variable) = 0.

If this relationship does not hold, then either the primal solution or the dual solution or both are no optimal.

8. If the primal problem has no optimal solution because of infeasibility, then the dual problem will have no optimal solution because of unboundedness.
9. If the primal has no optimal solution because of unboundedness, then the dual will have no optimal solution because of infeasibility.

COST SHEET, PROFITABILITY ANALYSIS AND COMPARISON

Question 1

“Costs may be classified in a variety of ways according to their nature and the information needs of the management” Explain.

Answer

Cost classification is the process of grouping costs according to their characteristics. Costs are classified or grouped according to their common characteristics. Costs may be classified according to elements, according to functions or operations, according to their behaviour, according to controllability or according to normality.

The break up of the aggregate costs into relevant types, is an essential pre-requisite of decision making as well as of controlling costs. Classification of costs on different bases is thus necessary for various purposes. For the purpose of decision-making and control, costs are distinguished on the basis of their relevance to different type of decisions and control functions. The importance of distinguishing cost as direct or indirect **lies in the fact that direct costs of a product or an activity can be accurately allocated while indirect costs have to be apportioned on the basis of certain assumptions.** This is so because direct costs are controllable at the operational level whereas indirect costs are not amenable to such control.

Question 3

What do you understand by a Balanced Scorecard? Give reasons why Balanced Scorecards sometimes fail to provide for the desired results. Do you think that such a scorecard is useful for external reporting purposes?

Answer

The Balanced Scorecard can be defined as ‘an approach to the provision of information to management to **assist strategic policy formulation** and achievement. It emphasises the need to provide the user with a set of information, which addresses all relevant areas of performance in an objective and unbiased fashion. The information provided may include both financial and non financial elements, and cover areas such as profitability, customer satisfaction, internal efficiency and innovation’.

It is clear from the above definition that the central idea of the Balanced Scorecard is that managers should develop the measures on which they manage the business from four different perspectives:

1. customer satisfaction
2. internal business process e.g., operating cycle time.
3. kaizen approach (can we continue to improve and create value)
4. financial e.g., operating income by segments.

According to Kaplan and Norton, the ultimate result of using the Balanced Scorecard approach should be **an improved long-term financial performance**. Since the scorecard gives equal importance to the relevant non – financial measures, it should discourage the short termism that leads to cuts in spending on new product development, human resource development etc which are ultimately detrimental for the future prospects of the company. The responsibility to devise and implement a Balanced Scorecard

should be that of the managers working with the business. Since every company is different, it shall need to work out for itself the various financial and non – financial measures, which need to be focussed upon for its own development. Since the Balanced Scorecard is recommended as a management tool used both for internal and external reporting purposes, it is again the manager's responsibility to decide as to what information needs to be disclosed and how any problems of confidentiality can best be overcome.

The following are some reasons why Balanced Scorecards sometimes fail to provide for the desired results;

- The use of non financial measures leads managers to think that they have a Balanced Scorecard already working for strategic purposes.
- Senior executives misguidedly delegate the responsibility of the Scorecard implementation to middle level managers.
- Company's try to copy measures and strategies used by the best companies rather than developing their own measures suited for the environment under which they function.
- There are times when Balanced Scorecards are thought to be meant for reporting purposes only. This notion does not allow a Business to use the Scorecard to manage Business in a new and more effective way.

It may be noted that the above-mentioned difficulties refer to the internal use of the Scorecard. It remains a matter of debate whether a Balanced Scorecard is applicable to external reporting. Critics argue that if the Scorecard is indeed a relevant driver of long term performance, shouldn't the information generated be of interest to the investment community? However, it has been noticed that the Scorecard does not translate easily to the investment community for the simple reason that it makes sense for individual business units and different individual projects rather than the company as a whole. Most companies have different divisions with their own mission and strategy and hence these individual scorecards cannot be aggregated into an overall corporate scorecard. However, in case the company somehow manages to overcome such a problem and indeed use its Scorecard for external reporting, it may end up passing sensitive information to its competitors which may end up being detrimental to the company in the long run. However, with changes in the thinking process of the investment community, such strategic reporting could well be accepted in the near future.

10.3.1 Direct product profitability (DPP) :

As traditional absorption costing, which normally uses labour hours as a basis for absorption, is rarely suitable for service and retail organizations other methods had to be devised. One relatively new way of spreading overheads in retail organisations, which is used in the grocery trade in particular, is direct product profitability (DPP). DPP started in the USA in the 1960s at General Electric, and was then taken up and used by Proctor and Gamble in the 1980s.

Even in 1993 Doherty et al said that : *"DPP in retailing is not and cannot be fully-fledged costing system, where every last penny of expense has to be recovered. The level of cost information available to retailers is generally not detailed enough to allow for that."*

Benefits of DPP

- Better cost analysis

- Better pricing decisions
- Better management of stores and warehouse space

Direct product profitability statement : Retail organisations traditionally deducted the bought-in cost of goods from the selling price to give a gross margin. **The gross margin is useless measure for controlling the costs of the organisation** itself or making decisions about the profitability of the different products. This is because none of the costs generated by the retail organisation itself are included in its calculation. For example, it does not include the storage costs of the different goods and these costs vary considerably from one good to another. **A method was needed which related the indirect costs to the goods according to the way the goods used or created these costs.**

Indirect costs, for DPP may be analysed into basic cost categories as follows :

- (i) *Overhead cost* : This is incurred through an activity that is not directly linked to a particular product.
- (ii) *Volume related cost* : The cost is incurred in relation to the space occupied by products. This includes storage and transport costs.
- (iii) *Product batch cost* : This cost is often a time based cost. If product items (that is a number of identical products which are handled together as a batch) are stocked on shelves a labour time cost is incurred.
- (iv) *Inventory financing costs* : This is the cost of tying up money in stock and is the cost of the product multiplied by interest rate per day or per week.

10.3.2 Customer profitability analysis :

In many organisations it is just as important to cost customers as it is to cost products. Different customers or groups of customers differ in their profitability. This is a relatively new technique that ABC makes possible because it creates cost pools for activities. Customers use some activities but not all, and different groups of customers have different 'activity profiles'.

Service organisations, such as a bank or a hotel, in particular need to cost customers. A bank's activities for a customer will include the following types of activities :

- Withdrawal of cash
- Unauthorised overdraft
- Request for a statement
- Stopping a cheque
- Returning a cheque because of insufficient funds.

Benefits of customer profitability analysis.

1. It helps the supplier to identify which customers are eroding overall profitability and which customers are contributing to it.
2. It can help to provide a basis for constructive dialogue between buyer and seller to improve margins.

UNIFORM COSTING AND INTER FIRM COMPARISON

Question 1

What are the requisites for the installation of a uniform costing system ?

Answer

Requisites for the installation of uniform costing: Essential requisites for the installation of uniform costing are as under:

- (i) The firm's in the industry should be willing to share / furnish relevant data or information.
- (ii) A spirit of cooperation and mutual trust should prevail among the participating firms.
- (iii) Mutual exchange of ideas, methods used, special achievement made, research and know how etc. should be frequent.
- (iv) Bigger firms should take the lead towards sharing their experience and know how with the smaller firm to enable the latter to improve their performance.
- (v) In case of accounting methods, principles, procedure and production method uniformity must be established.

Question 2

What is uniform costing? Why is it recommended?

Answer

Uniform Costing: It is not a distinct method of costing when several undertakings start using the same costing principles or practices, they are said to be following uniform costing. Different concerns in an industry should adopt a common method of costing and apply uniformly the same principles and techniques for better cost comparison and common good and helps in mutual cost control and cost reduction. Hence, it is recommended that a uniform method of costing should be adopted by the member units of an industry.

.1.1 Objectives of Uniform Costing: The main objectives of Uniform Costing are as follows :—

1. *Facilitates Comparison:* To facilitate the comparison of costs and performances of different units in the same industry; it provides objective basis.
2. *Eliminates Unhealthy Competition:* To eliminate unhealthy competition among the different units of an industry.
3. *Improves Efficiency:* To improve production capacity level and labour efficiency by comparing the production costs of different units with each other.
4. *Provides Relevant Data:* To provide relevant cost information/data to the Government for fixing and regulating prices of the products.
5. *Ensures Standardisation:* To bring standardisation and uniformity in the operation of participating units.
6. *Reduces Cost:* To reduce production, administration, selling and distribution costs, and to exercise control on fixed costs.

9.1.3 Advantages of Uniform Costing : The advantages accruing from the use of uniform costing system are as follows :-

1. The management of each firm will be saved from the exercise of developing and introducing a costing system of its own.
2. A costing system devised by mutual consultation and after considering the difficulties and circumstances prevailing in different firms is readily adopted and successfully implemented.
3. It facilitates comparison of cost figures of various firms to enable the firms to identify their weak and strong points besides controlling costs.
4. Optimum achievement of efficiency is attempted by all the firms by utilising the experience of other concerns in the industry.
5. Standing in the industry of each firm will be known by making a comparison of its cost data with others.
6. Services of cost consultants or experts may be available jointly to each firm in the industry by sharing their experiences and expenses.
7. Research and development benefits of bigger firms may be made available to smaller firms.
8. It helps in the reduction of labour turnover, as a uniform wage system is the pre-condition of a uniform costing system.
9. It helps Trade Associations in negotiating with the Government for any assistance or concession in the matters of taxation, exports, subsidies, duties and prices determination etc.
10. Unhealthy competition is avoided among the firms in the same industry in framing pricing policies and submitting tenders.
11. Prices fixed on the basis of uniform costing are representative of the whole industry and thus are reliable.
12. Uniform costing provide a basis for the comparative assessment of the performance of two firms in the same industry but in different sectors.
13. It helps the Government in regulating the prices of essential commodities such as bread, sugar, cement, steel etc.

9.1.4 Limitations of Uniform Costing :

1. Sometimes it is not possible to adopt uniform standards, methods and procedures of costing in different firms due to differing circumstances in which they operate. Hence, the adoption of uniform costing becomes difficult in such firms.
2. Disclosure of cost information and other data is an essential requirement of a uniform costing system. Many firms do not wish to share such information with their competitors in the same industry.
3. Small firms in an industry believe that uniform costing system is only meant for big and medium size firms, because they cannot afford it.
4. It induces monopolistic trend in the business, due to which prices may be increased artificially and supplies withheld.

9.2 INTER-FIRM COMPARISON

Meaning

It is technique of evaluating the performance, efficiency, costs and profits of firms in an industry. It consists of voluntary exchange of information/data concerning costs, prices, profits, productivity and overall efficiency among firms engaged in similar type of operations for the purpose of bringing improvement in efficiency and indicating the weaknesses. Such a comparison will be possible where uniform costing is in operation.

An inter-firm comparison indicates the efficiency of production and selling, adequacy of profits, weak spots in the organisation, etc. and thus demands from the firm's management an immediate suitable action. Inter-firm comparison may enable the management to challenge the standards which it has set for itself and to improve upon them in the light of the current information gathered from more efficient units. Such a comparison may be carried out in electrical industry, printing firms, cotton spinning firms, pharmaceuticals, cycle manufacturing, etc.

9.2.2 Advantages of Inter-firm comparison : The main advantages of inter-firm comparison are :-

1. Such a comparison gives an overall view of the industry as a whole to its members– the present position of the industry, progress made during the past and the future of the industry.
2. It helps a concern in knowing its strengths or weaknesses in relation to others so that remedial measures may be taken.
3. It ensures an unbiased specialized reporting on particular problems of the concern.
4. It develops cost consciousness among members of the industry.
5. It helps Government in effecting price regulation.
6. It helps to improve the quality of products manufactured and to reduce the cost of production. It is thus advantageous to the industry as well as to the society.

9.2.3 Limitations of inter-firm comparison

The following are the limitations in the implementation of a scheme of inter-firm comparison :

1. Top management feels that secrecy will be lost.
2. Middle management is usually not convinced with the utility of such a comparison.
3. In the absence of a suitable Cost Accounting System, the figures supplied may not be reliable for the purpose of comparison.
4. Suitable basis for comparison may not be available.

TRANSFER PRICING

Question 2

Indicate the *possible disadvantages* of treating divisions as profit centres.

Answer

The Possible disadvantages of treating divisions as profit centres are as follows:

1. Divisions may compete with each other and may take decisions to increase profits at the expense of other divisions thereby overemphasizing short term results.
2. It may adversely affect co-operation between the divisions and lead to lack of harmony in achieving organizational goals of the company. Thus it is hard to achieve the objective of goal congruence.
3. It may lead to reduction in the company's overall total profits.
4. The cost of activities, which are common to all divisions, may be greater for decentralized structure than centralized structure. It may thus result in duplication of staff activities.
5. Top management loses control by delegating decision making to divisional managers. There are risks of mistakes committed by the divisional managers, which the top management, may avoid.
6. Series of control reports prepared for several departments may not be effective from the point of view of top management.
7. It may under utilize corporate competence.
8. It leads to complications associated with transfer pricing problems.
9. It becomes difficult to identify and define precisely suitable profit centres.
10. It confuses division's results with manager's performance.

Question 6

What are some *goals* of a 'transfer-pricing' system in an organization?

Answer

The goals of transfer pricing are that it should:

1. Provide information that motivates divisional managers to take good economic decisions which will improve the divisional profits and ultimately the profits of the company as a whole.
2. Provide information which will be useful for evaluating the divisional performance.
3. Seek to achieve goal congruence.
4. Ensure that divisional autonomy is not undermined

Question 14

What should be the basis of transfer pricing, if unit variable cost and unit selling price are not constant?

Answer

If unit variable cost and unit selling price were not constant then the main problem that would arise while fixing the transfer price of a product would be as follows:

There is an optimum level of output for a firm as a whole. This is so because there is a certain level of output beyond which its net revenue will not rise. *The ideal transfer price under these circumstances will be that which will motivate these managers to produce at this level of output.*

Essentially, it means that some division in a business house might have to produce its output at a level less than its full capacity *and in all such cases a transfer price may be imposed centrally.*

Question 15

(a) What will be the marketable transfer pricing procedure regarding the goods transferred under the following conditions (each condition is independent of the other)?

(i) When division are not captives of internal divisions and the divisions are free to do business both internally and externally and when there are reasonably competitive external markets for the transferred products.

(ii) If the external market for the transferred good is not reasonably competitive.

(b) Discuss the potential for maximization of income by a multinational through the use of transfer pricing mechanism.

Answer

(a) Marketable Transfer Pricing Procedure

(i) When division are not captives of internal divisions and the divisions are free to do business both internally and externally and when there are reasonably competitive external markets for the transferred products, *then the most suitable transfer price would be, the market price*, as it generally leads to optimal decisions.

(ii) In case, the external market for the transferred good is not reasonable competitive, following two situations may arise in this case.

(a) If there is idle capacity: Under this situation opportunity cost will be zero *hence minimum transfer price should be equal to the additional outlay costs incurred upto the point of transfer* (sometimes approximated by variable costs).

(b) If there is no idle capacity: Under this situation *opportunity cost should be added to outlay costs for determining minimum transfer price.*

(b) The potential for maximization of income by a multinational through the use of transfer pricing mechanism is based on the successful implementation of the following steps:

(i) Transfer pricing may be set relatively higher for affiliates in relatively high tax countries that purchase inputs from affiliates located in relatively low-tax countries.

(ii) Transfer prices to affiliates in countries which are subject to import duties for goods or services purchase may be set low so as to avoid host country taxes.

(iii) Transfer prices to an affiliate in a country that is encountering relatively high inflation may be set relatively high to avoid some of the adverse effects of local currency devaluation that are related to the high inflation.

(iv) Transfer prices may be set high for goods and services purchased by an affiliate operating in a country that has imposed restriction on the repatriation of income to foreign companies.

(v) Transfer prices may be set low for an affiliate that is trying to establish a competitive advantage over a local company either to break into a market or to establish a higher share of the company's business.

8.2 OBJECTIVES OF TRANSFER PRICING SYSTEM

The main-objectives of intra-company transfer pricing are as below:

- i) Emphasis on Profits
- ii) Maximum Utilisation of plant capacity
- iii) Optimise allocation of financial resources

COSTING OF SERVICE SECTOR

Question 2

Discuss with examples, the basic costing methods to assign costs to services.

(May 2007, 5 Marks)

Answer

- (i) Job costing method: The cost of a particular service is obtained by assigning costs to a distinct identifiable service. e.g. Job Costing method is used in service sectors – like Accounting Firm, Advertisement campaign.
- (ii) Process Costing method: Cost of a service is obtained by assigning costs to masses of similar unit and then computing cost / unit on an average basis. e.g. Retail banking, postal delivery, credit card etc.
- (iii) Hybrid method: Combination of both (i) & (ii) above.

Question 4

Explain the main characteristics of Service sector costing.

Answer

Main characteristics of service sector are as below:

- (a) Activities are labour intensive: The activities of service sector generally are labour intensive. The direct material cost is either small or non-existent.
- (b) Cost-unit is usually difficult to define: The selection of cost units usually, for service sector is difficult to ascertain as compared to the selection of cost unit for manufacturing sector. The following table provides some examples of the cost units for service sector.
 - *Hospital* – Patient per day, Room per day
 - *Accounting firm* – Charged out client hours
 - *Transport* – passenger km., quintal km.
 - *Machine maintenance* – Maintenance hours provided to user department
 - *Computer department* – Computer time provided to user department.
- (c) Product costs in service sector: Costs are classified as product or period costs in manufacturing sector for various reasons.

The following table provides some examples of the cost units for service sector.

(A) To External Customers Cost Unit

- (i) Hotel Bed nights available, Bed night occupied
- (ii) School Student hours, Full time students
- (iii) Hospital Patient per day, Room per day
- (iv) Accounting firm Charged out client hours
- (v) Transport Passenger km., quintal km.

(B) Internal services Cost Unit

- (i) Staff canteen Meals provided, No. of staff
- (ii) Machine maintenance Maintenance hours provided to user department
- (iii) Computer department Computer time provided to user department

Sohrab

STANDARD COSTING

Question 1

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

Answer

Features of Partial Plan of Standard Cost Accounting procedure:

Standard cost operations can be recorded in the books of account by using partial plan, Features of partial plan of standard costing procedure are as follows:

- (i) Partial plan system uses current standards in which the inventory will be valued at current standard cost figure.
- (ii) Under this method WIP account is charged at the actual cost of production for the month and is credited with the standard cost of the month's production of finished product.
- (iii) The closing balance of WIP is also shown at standard cost. The balance after making the credit entries represents the variance from standard for the month.
- (iv) The analysis of variance is done after the end of the month.

Question 4

"Overhead variances should be viewed as interdependent rather than independent".

Explain.

Answer

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

Question 17

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

Answer

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

1. **Transfer all variances to Profit and Loss Account.** Under this method, stock of work-in- progress, finished stock and cost of sales are maintained at standard cost and variances arising are transferred to profit and loss account.
2. **Distributing variances on pro-rata basis over** the cost of sales, work-in-progress and finished goods stocks by using suitable basis.

3. **Write off quantity variance to profit and loss account** and **spread price variance over to cost** of sales, work in progress and finished goods. The reason behind apportioning variance to inventories and cost of sales is that they represent costs although they are derived as variances.

Question 18

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

Answer

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

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

- (i) The amount of variance
- (ii) The factors or causes of their occurrence
- (iii) The responsibility to be laid on executives and departments and
- (iv) Corrective actions which should be taken to obviate or reduce the variances.

Mere calculation and analysis of variances is of no use. The success of variance analysis depends upon how quickly and effectively the corrective actions can be taken on the analysed variances. In fact variance gives information. The manager needs to act on the information provided for taking corrective action. Information is the means and action taken on it is the end. In other words, the calculation of variances in standard costing is not an end in itself, but a means to an end.

Question 19

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

Answer

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

- (i) Variances of efficiency. These are the variance, which arise due to efficiency or inefficiency in use of material, labour etc.
- (ii) Variances of prices and rates: These are the variances, which arise due to changes in procurement price and standard price.

(iii) Variances due to volume: These represent the effect of difference between actual activity and standard level of activity.

Question 20

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

Answer

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

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

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

Material variances

In the case of material purchase price variance, suppose the standard price of raw material determined was Rs.5 per unit, the general market price per unit at the time of purchase was Rs.5.20 and actual price paid per unit was Rs.5.18 on the purchase of say 10,000 units of raw material.

In this case the variances to be computed should be:

Uncontrollable material purchase price planning variance:

= (Standard price p.u. – General market price p.u.) Actual quantity purchased

= (Rs.5 – Rs.5.20) 10,000 units = Rs.2,000 (Adverse)

Controllable material purchase price efficiency variance:

= (General market price p.u. – Actual price paid p.u.) Actual quantity purchased

= (Rs.5.20 – 5.18) 10,000 units

= Rs.200 (Fav.)

In the case of material usage variance, suppose the standard quantity per unit be 5 kgs, actual production units be 250 and actual quantity of material used is 1,450 kgs. Standard cost of material per kg. was Re.1. Because of shortage of skilled labour it was felt necessary to use unskilled labour and that increased material usage by 20%. The variances to be computed to deal with the current environmental conditions will be:

Uncontrollable material usage planning variances:

= (Original std. quantity in kgs. – Revised std. quantity in kgs.) Standard price per kg.

= (1,250 kgs. – 1,500 kgs) Re.1

= Rs.250 (Adverse)

Controllable material usage efficiency variance:

= (Revised standard quantity in kgs. Actual quantity used in kgs.) Standard price per kg.

= (1,500 kgs. – 1,450 kgs.) Re.1
= Rs.50 (Favourable)

Question 3

Mention the causes that give rise to labour rate variance.

Answer

Causes for the occurrence of labour rate variance: This variance arises due to the difference between standard labour hour rate specified and the actual labour hour rate paid. It is computed by multiplying the actual hours taken by workers on a job by the difference between the standard and actual wage rate per hour. Main causes which contribute for the occurrence of labour rate variance are as below:

- (i) Increase in actual wage rate per hour paid to workers.
- (ii) Use of wrong type of labour i.e. for a job requiring the use of non-skilled labour uses skilled labour.
- (iii) Since the wages of skilled labour are more than that of non-skilled labour therefore this increased wage rate per hour of skilled labour force accounts for the occurrence of labour rate variance.
- (iv) Payment of special increments or allowances to workers.
- (v) Non-anticipated wage increase at the time of setting standards,
- (vi) Using a gang or mix different from that used for setting labour standard.
- (vii) Resorting to excessive overtime.

6.5.2 Single Plan:

The main purpose of standard costing is cost control. To achieve this purpose, the variances should be analysed according to their causes. Analysis should be timely so that much time is not lost in taking corrective action wherever needed. In the partial plan, we have seen that the variances are analysed at the end of period. The single plan system envisages the posting of all items in the debit side of the work-in-progress account at the standard cost leaving the credit side to represent the standard cost of finished production and work-in-progress. This system enables the ascertainment of variances as and when the transaction is posted to work-in-progress account. In other words, the analysis of variances is done from the original documents like invoices, labour sheets, etc., and this method of analysis is known as analysis at source. Since, the single plan system contemplates the analysis of variances at source, the installation of this system requires more planning so that effective documentation at each stage is introduced for proper recording and analysis of variance.

Thus for example, the issue of bill of materials to the stores enables the storekeeper to calculate the standard value of materials. If any material is requisitioned beyond the standard, he can mark the same for material usage variance account. In the production department, as and when the finished output is recorded, the standard waste and actual waste can be compared and necessary entries can be made by the shop supervisors for posting the excessive usage to appropriate variance accounts.

Scheme of entries:

So far as materials are concerned, material price variances are recorded at the time of receipt of the material and the material quantity variances are recorded as far as possible when excess materials are used. The entries will be as illustrated below:

1. Dr. Material Control A/c

Dr. or Cr. Material Price Variance A/c

Cr. Creditors A/c.

This entry enables the firm to debit the material control account with the actual purchases at standard cost and credit the creditor's account at the actual cost of actual prices thereby transferring the variances to price variance account.

2. Dr. Work-in-progress Control A/c

Dr. or Cr. Material Usage Variances A/c

Cr. Material Control A/c

This entry charges the work-in-progress control account with the standard cost of standard quantity and credit the material control account at the standard cost of actual issue, the variance being transferred to usage variance account.

3. Dr. Wages Control A/c

Dr./Cr. Labour Rate Variances A/c

Cr. Cash

This entry is passed to record the wages at standard rate thereby transferring rate variances to the appropriate account.

4. Dr. Work-in-progress Control A/c

Dr. or Cr. Overhead Expense Variances A/c

Cr. Overhead Expense Control A/c.

6.6 BEHAVIOURAL ASPECTS OF STANDARD COSTING

1. *Projection of fixed overheads and estimated selling price in a Standard Cost Sheet is a circular exercise with no added value.*

In an award winning article, "COST / MANAGEMENT ACCOUNTING: THE 21ST CENTURY PARADIGM", published in Management Accounting (USA), December 1995, [William L Ferrara](#) argues that while preparing a Standard Cost Sheet, one of the objectives of which is to assist management in pricing products, a professional cannot project fixed overheads until and unless he is aware of the production quantum to be effected. The forecast of future production can only be made if a tentative selling price of the product is known because, in a competitive market, it is the selling price which decides the sale quantity and therefore the production volume. The authors contend that in case the selling price is known at the time of projecting fixed overheads then the re computation of the same is a valueless exercise.

2. *Traditional costing tools like standard costing induce a static behaviour in the employees.*

During the past decade and a half, various writers such as Johnson and Kaplan, Ferrara and Monden etc have questioned the productivity and use of traditional systems such as standard costing and variance

analysis. They argue that the use of standard costing renders employees static and curbs innovation and that companies following traditional standard costing find it difficult to improve upon standards because of severe resistance from employees who are convinced that the established best practise cannot be improved further.

3. Fear of adverse variances forces managers to give undue importance to material price, labour rate and efficiency and capacity utilisation.

These concepts are detrimental to the modern day world class manufacturing environment characterised by concepts of JIT and TQM. In a World Class Manufacturing environment, characterised by Just in Time policies, the focus of the management is to produce only as much as is required. This requires purchase of small quantities of raw material, increase in the number of set ups and minimal importance to capacity utilisation. Policies like this result in increased adverse variances related to raw material prices, labour efficiency and production volume. Critics argue that the fear of such adverse variances affects goal congruence and forces managers to behave against their company's policies.

4. Traditional costing does not provide the management with what is the allowable cost; rather it emphasises on the standard or actual costs.

This is looked upon as one of the major reasons for lack of innovation especially in the global era where competition amongst companies is unprecedented. *It is argued that techniques like Target costing are much more motivating when compared to Traditional costing* since the former encourage the use of concepts like value engineering and value analysis.

BUDGET & BUDGETARY CONTROL

Question 4

Describe the process of zero-base budgeting.

Answer

The zero Base Budgeting involves the following steps:

- (i) Corporate objectives should be established and laid down in details.
- (ii) Decide about the techniques of ZBB to be applied.
- (iii) Identify those areas where decisions are required to be taken.
- (iv) Develop decision programmes and rank them in order of preferences.
- (v) Preparation of budget, that is translating decision packages into practicable units/items and allocating financial resources.

Question 8

(a) What are the advantages and limitations of Zero base Budgeting?

(b) What are benchmarking code of conduct?

Answer

(a) Advantage of ZBB

- (i) It provides a systematic approach for evaluation of different activities and ranks them in order of preference for allocation of scarce resource.
- (ii) It ensures that the various functions undertaken by the organisation are critical for the achievement of its objectives and are being performed in the best way.
- (iii) It provides an opportunity to the management to allocate resources for various activities only after having a thorough cost-benefit analysis.
- (iv) The area of wasteful expenditure can be easily identified and eliminated.
- (v) Departmental budgets are closely linked with corporate objectives.
- (vi) The technique can also be used for the introduction and implementation of the system of 'management by objective'.

Limitations of ZBB

- (i) Various operational problems are likely to be faced in implementing the technique.
- (ii) The full support of top management is required.
- (iii) It is time consuming as well as costly.
- (iv) It requires proper trained managerial staff.

(b) Benchmarking code of conduct

Benchmarking is the process of identifying and learning from the best practices anywhere in the world. It is a powerful tool for continuous improvement. To contribute to efficient, effective and ethical benchmarking, individuals agree for themselves and their organisation to be abided by the following principles for the benchmarking with other organisations.

Suggested benchmarking code of conduct:

- (i) Principle of legality
- (ii) Principle of exchange
- (iii) Principle of confidentiality
- (iv) Principle of use
- (v) Principle of first party contact
- (vi) Principle of third party contact
- (vii) Principle of preparation

Question 6

What do you mean by a flexible budget? Give an example of an industry where this type of budget is typically needed?

Answer

A flexible budget is a budget which, by recognizing the difference between fixed, semi-variable and variable costs, is designed to change in relation to the level of activity attained. E.g. seasonal products – e.g. soft drink industry industries in make to order business like ship building industries influenced by change in fashion. Industries which keep on introducing new products / new designs.

Question 7

Describe the four types of bench marking of critical success factors.

Answer

The Benchmarking is of following types:

- (i) Competitive benchmarking: It involves the comparison of competitors products, processes and business results with own.
- (ii) Strategic benchmarking: It is similar to the process benchmarking in nature but differs in its scope and depth.
- (iii) Global benchmarking: It is a benchmarking through which distinction in international culture, business processes and trade practices across companies are bridged and their ramification for business process improvement are understood and utilized.
- (iv) Process benchmarking: It involves the comparison of an organisation critical business processes and operations against best practice organization that performs similar work or deliver similar services.
- (v) Functional Benchmarking or Generic Benchmarking: This type of benchmarking is used when organisations look to benchmark with partners drawn from different business sectors or areas of activity to find ways of improving similar functions or work processes.
- (vi) Internal Benchmarking: It involves seeking partners from within the same organization, for example, from business units located in different areas.
- (vii) External Benchmarking: It involves seeking help of outside organisations that are known to be best in class. External benchmarking provides opportunities of learning from those who are at the leading edge, although it must be remembered that not every best practice solution can be transferred to others.

Question 13

Explain briefly stages involved in the process of Bench marking.

Answer

Process of Benchmarking: The process of benchmarking requires a Company to identify the areas i.e. processes, activity etc. which are central to its business and then selects the top-performing companies in those areas. The benchmarking process is comprised of following stages. These stages are:

1. Planning:

(i) Determination of benchmarking goal statement: This requires identification of areas to be benchmarked. In practice, one should start with the identification of those areas which have to be really good to be really successful.

(ii) Identification of best performance: Once the benchmarked goal statement are defined, the step is seeking the best of the breed or best of the best.

(iii) Establishment of the benchmarking or process improvement team: Ideally this should include the persons who are most knowledgeable about the internal operations and will be directly affected by changes due to benchmarking.

(iv) Defining the relevant benchmarking measurement: Relevant measures will not include the measures used by the organisation today but they will be refined measures that comprehend the true performance differences.

2. Collection of data and information:

The data gathering for benchmarking could be done through national/international clearing houses, mail surveys, suppliers, company visits, telephone, interviews etc. In recent years national and international clearing houses have been set up.

3. Analysing the findings: The analysing of finding of step (2) requires following:

(i) Review the findings and produce tables, charts and graphs to support the analysts.

(ii) Identify gaps in performance between our organisation and better performers.

(iii) Seek explanations for the gaps in performance. The performance gaps can be positive, negative or zero.

(iv) Ensure that comparisons are meaningful and credible.

(v) Communicate the findings to those who are affected.

(vi) Identify realistic opportunities for improvements.

4. Recommendations: This involves:

Making recommendation: This requires:

(i) Deciding the feasibility of making the improvements in the light of the conditions that apply within own organisation.

(ii) Agreement of the improvements that are likely to be feasible.

(iii) Producing a report on the Benchmarking in which the recommendations are included.

(iv) Obtaining the support of key stakeholder groups for making the changes needed.

(v) Developing action plan(s) for implementation.

5. Monitoring and reviewing: This involves:

(i) Evaluating the benchmarking process undertaken and the results of the improvements against objectives and success criteria plus overall efficiency and effectiveness.

(ii) Documenting the lessons learnt and make them available to others.

(iii) Periodically re-considering the benchmarks

Question 5

“Because a single budget system is normally used to serve several purposes, there is a danger that they may conflict with each other”. Do you agree? Discuss.

Answer

A single budget system may be conflicting in planning and motivation, and planning and performance evaluation roles as below:

- (i) Planning and motivation roles – Demanding budgets that may not be achieved may be appropriate to motivate maximum performance but they are unsuitable for planning purposes. For these, a budget should be a set based on easier targets that are expected to be met.
- (ii) Planning and performance evaluation roles - For planning purposes budgets are set in advance of the budget period based on an anticipated set of circumstances or environment. Performance evaluation should be based on a comparison of active performance with an adjusted budget to reflect the circumstance under which managers actually operated.

5.3.2 Participative budgeting:

CIMA defines participative budgeting as:

A budgeting system in which all budget committee members are given the opportunity to apply their own budgets in practice.

This is known as 'bottom-up budgeting'. It contrasts with imposed or top-down budgets where the ultimate budget holder does not have the opportunity to participating in the budgeting process.

The advantages of participative budgeting are as follows:

- Improved quality of forecasts to use as the basis for the budget: Managers who are doing a job on a day-to-day basis are likely to have a better idea of what is achievable, what is likely to happen in the forthcoming period, local trading conditions, etc.
- Improved motivation: Budget holders are more likely to want to work to achieve a budget that they have been involved in setting themselves, rather than one that has been imposed on them from above.
- Better results: being the executor of the budget the applicant can control the costs better than any other manager.

5.3.3 The Budget Manual:

Effective budgetary planning relies on the provision of adequate information to the individuals involved in the planning process. Many of these information needs are contained in the budget manual. A budget manual is a collection of documents that contains key information for those involved in the planning process. Typical contents could include the following:

- a) An introductory explanation of the budgetary planning and control process, including a statement of the budgetary objective and desired results.
- b) A form of organisation chart to show who is responsible for the preparation of each functional budget and the way in which the budgets are interrelated.
- c) A timetable for the preparation of each budget. This will prevent the formation of a 'bottleneck' with the late preparation of one budget holding up the preparation of all others.

- d) Copies of all forms to be completed by those responsible for preparing budgets, with explanations concerning their completion.
- e) A list of the organization's account codes, with full explanations of how to use them.
- f) Information concerning key assumptions to be made by managers in their budgets, for example the rate of inflation, key exchange rates, etc

5.7.2 Traditional Budgeting vs Zero- based budgeting.

Following are the points of difference between traditional budgeting and zero based budgeting:

1. Traditional budgeting is accounting oriented. Main stress happens to be on previous level of expenditure. Zero-based budgeting makes a decision oriented approach. It is very rational in nature and requires all programmes, old and new, to compete for scarce resources.
2. In traditional budgeting, first reference is made to past level of spending and then demand for inflation and new programmes. In zero based budgeting a decision unit is broken into understandable decision packages, which are ranked according to importance to enable to top management to focus attention to only on decision packages, which enjoy priority to others.
3. In tradition budgeting, some managers deliberately inflate their budget request so that after the cuts they still get what they want. In zero-base budgeting, a rationale analysis of budget proposals is attempted. The managers, who unnecessarily try to inflate the budget request, are likely to be caught and exposed. Management accords its approval only to a carefully devised result-oriented package.
4. Traditional budgeting is not as clear and as responsive as zero base budgeting is.
5. In traditional budgeting. Its for top management to decide why a particular amount should be spent on a particular decision unit. In Zero-base budgeting, this responsibility is shifted from top management to the manager of decision unit.
6. Traditional budgeting makes a routine approach. Zero-base budgeting makes a very straightforward approach and immediately spotlights the decision packages enjoying priority over others.

5.8 PERFORMANCE BUDGETING (PB)

Performance Budgeting provide a meaningful relationship between estimated inputs and expected outputs as an integral part of the budgeting system. 'A performance budget is one which presents the purposes and objectives for which funds are required, the costs of the programmes proposed for achieving those objectives, and quantities data measuring the accomplishments and work performed under each programme. Thus PB is a technique of presenting budgets for costs and revenues in terms of functions. Programmes and activities are correlating the physical and financial aspect of the individual items comprising the budget.

5.8.1 Traditional budgeting vs. Performance budgeting

1. The traditional budgeting (TB) gives more emphasis on the financial aspect than the physical aspects or performance. PB aims at establishing a relationship between the inputs and the outputs.
2. Traditional budgets are generally prepared with the main basis towards the objects or items of expenditure i.e. it highlights the items of expenditure, namely, salaries, stores and materials, rates rents and taxes and so on. In the PB latter the emphasis is more on the functions of the organisation, the

programmes to discharge these function and the activities which will be involved in undertaking these programmes.

Steps in Performance Budgeting :

According to the Administrative Reforms Commission (ARC) the following steps are the basic ones in PB :

- (a) establishing a meaningful functional programme and activity classification of government operations
- (b) bring the system of accounting and financial management in accord with this classification
- (c) evolving suitable norms, yardsticks, work units of performance and units costs, wherever possible under each programme and activity for their reporting and evaluation.

The Report of the ARC use the following terms in an integrated sequence :

Function Programme Activity Project

The term 'function' is used in the sense of 'objective'. For achieving objectives 'programmes' will have to be evolved. In respect of time horizon, it is essentially a replacement of traditional annual fiscal budgeting by a more output-oriented, but still an annual, exercise. For an enterprise that wants to adopt PB, it is thus imperative that :

- (a) the objectives of the enterprise are spelt out in concrete terms.
- (b) the objectives are then translated into specific functions, programmes, activities and tasks for different levels of management within the realities of fiscal constraints ;
- (c) realistic and acceptable norms, yardsticks or standards and performance indicators should be evolved and expressed in quantifiable physical units.
- (d) a style of management based upon decentralised responsibility structure should be adopted, and
- (e) an accounting and reporting system should be developed to facilities monitoring, analysis and review of actual performance in relation to budgets.

Budget Ratios :

1. Efficiency Ratio = $(\text{Standard hours} \div \text{Actual hours}) \times 100$
2. Activity Ratio = $(\text{Standard hours} \div \text{Budgeted hours}) \times 100$
3. Calendar Ratio = $(\text{Available working days} \div \text{budgeted working days}) \times 100$
4. Standard Capacity Usage Ratio = $(\text{Budgeted hours} \div \text{Max. possible hours in the budgeted period}) \times 100$
5. Actual Capacity Usage Ratio = $(\text{Actual hours worked} \div \text{Maximum possible working hours in a period}) \times 100$
6. Actual Usage of Budgeted Capacity Ratio = $(\text{Actual working hours} \div \text{Budgeted hours}) \times 100$

PRICING DECISION

Question 1

What is *Penetration pricing*? What are the circumstances in which this policy can be adopted?

Answer

Penetration pricing: This pricing policy is in favour of using a low price as the principal instrument for penetrating mass markets early. It is opposite to skimming pricing. The low pricing policy is introduced for the sake of long-term survival and profitability and hence it has to receive careful consideration before implementation. It needs an analysis of the scope for market expansion and hence considerable amount of research and forecasting are necessary before determining the price.

Penetration pricing means a price suitable for penetrating mass market as quickly as possible through lower price offers. This method is also used for pricing a new product. In order to popularize a new product penetrating pricing policy is used initially. The company may not earn profit by resorting to this policy during the initial stage. Later on, the price may be increased as and when the demand picks up. Penetrating pricing policy can also be adopted at any stage of the product life cycle for products whose market is approached with low initial price. The use of this policy by the existing concerns will discourage the new concerns to enter the market. This pricing policy is also known as "*stay-out-pricing*".

Circumstances for adoption:

The *three* circumstances in which penetrating pricing policy can be adopted are as under:

- (i) When demand of the product is elastic to price. In other words, the demand of the product increases when price is low.
- (ii) When there are substantial savings on large-scale production, here increase in demand is sustained by the adoption of low pricing policy.
- (iii) When there is threat of competition. The prices fixed at a low level act as an entry barrier to the prospective competitions.

Question 3

Explain *Skimming pricing* strategy.

Answer

Skimming pricing

It is a policy where the prices are kept high during the early period of a product's existence. This can be synchronised with high promotional expenditure and in the latter years the prices can be gradually reduced. The reasons for following such a policy are as follows:

- (1) The demand is likely to be *inelastic* in the earlier stages till the product is established in the market.
- (2) The gradual reduction in price in the latter years will tend to increase the sales.
- (3) This method is preferred in the beginning because in the initial periods when the demand for the product is not known the price covers the initial cost of production.
- (4) High initial capital outlays needed for manufacture, results in high cost of production. In addition to this, the producer has to incur huge promotional activities resulting in increased costs. High initial prices

will be able to finance the cost of production particularly when uncertainties block the usual sources of capital.

Question 4

*How **Pareto analysis** is helpful in pricing of product in the case of firm dealing with multiproducts?*

Answer

In the case of firm dealing with multi products, it would not be possible for it to analyse price-volume relationship for all of them. Pareto Analysis is used for analysing the firm's estimated sales revenue from various products and it might indicate that approximately 80% of its total sales revenue is earned from about 20% of its products. Such analysis helps the top management to delegate the pricing decision for approximately 80% of its product to the lower level of management, thus freeing them to concentrate on the pricing decisions for products approximately 20% of which is essential for the company's survival.

Thus, a firm can adopt more sophisticated pricing methods for small proportion of products that jointly account for 80% of total sales revenue. For the remaining 80% products, which account for 20% of the total sales value the firm may use cost based pricing method.

Question 8

What is Pareto Analysis? Name some applications.

Answer

Vilfredo Pareto, an Italian economist, observed that about 70 – 80% of value was represented by 30 – 20% of volume. This observation was found to exist in many business solutions. Analysing and focusing on the 80% value relating to 20% volume helps business in the following areas.

- (i) Pricing of a product (in a multi-product company)
- (ii) Customer profitability.
- (iii) Stock control.
- (iv) Activity Based Costing (20% cost drivers are responsible for 80% of total cost)
- (v) Quality Control.

Question 9

State the general guidelines to be used in adopting a pricing policy in a manufacturing organization.

Answer

The general guidelines to be used in adopting a pricing policy are as under:

- (i) The pricing policy should encourage optimum utilization of resources.
- (ii) The pricing policy should work towards a better balance between demand and supply.
- (iii) The pricing policy should promote exports.
- (iv) The pricing policy should serve as an incentive to the manufacturers to maximize production by adopting improved technology.
- (v) The pricing policy should avoid adverse effects on the rest of the economy.

Question 3

Explain the concept of cost plus pricing. What are its advantages and disadvantages?

(May 2000)

Answer

Cost plus pricing: The most common method of price fixing in a business is to arrive at full cost, add a margin of profit and then set the selling price. During the world wars, the concept of cost plus pricing became very much prevalent, as most of the defence contracts were priced at full cost plus a pre-agreed quantum of profit. In cost plus pricing, the capacity utilisation of the concern has an important bearing and unless the same is considered on a realistic basis the determination of cost would get vitiated.

At present, in Government sometimes Tariff Commission, Bureau of Industrial Cost & Prices (BICP) are required to fix prices of certain products and services. They mainly adopt a system of cost plus pricing. Similarly, government has also set up a separate agency to fix prices for pharmaceutical products.

The advantages and disadvantages of cost plus pricing are as under:

Advantages:

- (i) It is a **fair method** and recovery of full costs is assured under it.
- (ii) It **leaves out scope for any uncertainty**.
- (iii) After arriving at full cost, the **profit percentage can be flexibly adjusted** to take care of market competition.
- (iv) *Assured Profit*: If price is greater than cost, the risk is covered. This is true when normal expected capacity basis of cost estimation is used

Disadvantages:

1. *Ignores demand*: It ignores demand. It fails to take into account the buyers' needs and willingness to pay which govern the sales volume obtainable at each series of prices.
2. *Ignores competition*: It fails to reflect competition adequately.
3. *Arbitrary cost allocation*: It takes for granted that the costs have been estimated with exact accuracy which is not often true particularly in multi-product firms because the common costs are allocated arbitrarily.
4. *Ignores opportunity cost*: For many decisions incremental costs rather than full costs play a vital role in pricing. This aspect is ignored.
5. *Price-Volume relationships*: Since the fixed overheads are apportioned on the basis of volume of production, the cost will be more if a sales volume is less and cost will be less if sales volume is more. The increase or decrease in sales volume again is dependent of price. Thus it is a vicious circle—cost plus mark up is price based on sales volume and sales volume is based on price.

Question 4

In what circumstances it may be justifiable to sell at a price below marginal cost? (May 2000)

Answer

It may be justifiable to sell at a price below marginal cost for a limited period under the following circumstances:

- (i) Where materials are of **perishable nature**
- (ii) Where stocks have been accumulated in large quantities and the market prices have fallen.

- (iii) To popularize a new product
- (iv) Where such reduction enables the firm to boost the sale of other products having larger profit margin.
- (v) To capture foreign markets
- (vi) To obviate shut down costs
- (vii) To retain future market

Question 6

Describe two pricing practices in which non-cost reasons are important, when setting prices. (Nov 2000)

Answer

Two pricing practices in which non-cost reasons are important when setting price are:

(i) Price discrimination and (ii) Peak load pricing.

(i) Price discrimination:

This is the practice of charging to some customers a higher price than that charged to other customers e.g. Airlines tickets for business travellers and LTC travellers are priced differently.

(ii) Peak load pricing:

This pricing system is based on capacity constraints. Under this pricing system a higher price for the same service or product is demanded when it approaches physical capacity limits e.g. telephones, telecommunication, hotel, car rental and electric utility industries are charged higher price at their peak load.

Question 16

Enumerate the uses of Pareto Analysis. (Nov 2008, 3 Marks)

Answer

Pareto analysis is useful to:

- (i) Prioritize problems, goals and objectives.
- (ii) Identify the root causes.
- (iii) Select and define the key quality improvement programs, key employee relations improvement programs etc.
- (iv) Verify the operating procedures and manufacturing processes.
- (v) Allocate physical, financial and human resources effectively.
- (vi) Maximise research and product development time.

4.6.4 Competitive pricing :

When a company sets its price mainly on the consideration of what its competitors are charging, its pricing policy under such a situation is called competitive pricing or competition-oriented pricing. It is not necessary under competitive pricing to charge the same price as charged by the concern's competitors. But under such a pricing the concern may keep its prices lower or higher than its competitors by a certain percentage. *Its own costs or demand may change*, but the concern maintains its price because its competitors maintain their prices. Conversely, the concern will change its price

when its competitors change their price, even if its own costs or demand have not altered. Different type of competitive pricing in vogue are as follows:

- (i) Going rate pricing
- (ii) Sealed bid pricing

(i) Going rate pricing:

It is a competitive pricing method under which a firm tries to keep its price at the average level charged by the industry. The use of such a practice of pricing is specially useful where it is difficult to measure costs. Adoption of going rate pricing will not only yield fair return but would be least disruptive for industry's harmony. Going rate pricing primarily characterizes pricing practice in homogeneous product markets, The concern [selling a homogeneous product in a highly competitive market](#) has actually very little choice about the setting of its price. There is apt to be a market determined price for the product, which is not established by any single firm or clique of firms but through the collective interaction of buyers and sellers.

The concern which is going to charge more than the going rate would attract virtually no customers. The concern should not charge less because it can dispose of its entire output at the going rate. Thus, under highly competitive conditions in a homogeneous product market (such as food, raw materials and textiles) the concern really has no pricing decision to make. The major challenge before such a concern is good cost control. Since promotion and personnel selling are not in the picture, the major marketing costs arise in physical distribution.

In pure oligopoly, where a few large concerns dominate the industry, the concern also tends to charge the same price as is being charged by its competitors. Since there are only a few concerns, each firm is quite aware of others' prices, and so are the buyers. This does not mean that the going price in an oligopoly market will be in practice indefinitely. It cannot, since industry costs and demand change over time.

(ii) Sealed bid-pricing:

Competitive pricing also dominates in those situations where firms compete on the basis of bids, such as original equipment manufacture and defence contract work. The objective of the firm in the bidding situation is to get the contract, and this means that it hopes to set its price lower than that set by any of the other bidding firms. But however the firm does not ordinarily set its price below a certain level. Even when it is anxious to get a contract in order to keep the plant busy, it can not quote price below marginal cost. On the other hand, if it raises its price above marginal cost, it increases its potential profit but reduces its chance of getting the contract.

4.6.5 Incremental pricing :

Incremental pricing is used because it involves comparison of the impact of decisions on revenues and cost. If a pricing decision results in a greater increase in revenue than in costs, it is favourable. Such a decision is not merely confined to comparison of revenues and costs. It also permits that consideration being given to other objectives of the business. Thus profitability can be set as the matter of primary consideration [and then the decision can be adjusted](#) to bring it in consonance with the other decision of the business.

The following points will be useful to show how this technique gives consideration to all repercussions of a decision.

1. *Relevant cost analysis*: This technique considers changes in costs rather than in average cost. **Overhead allocations are irrelevant.**
2. *Product-Line relationship analysis*: This technique necessitates consideration being given to possible complementary relations in demand. Sale of one product may lead to the **sale of a complementary product**. This overall effect on profitability has to be evaluated.
3. *Opportunity cost analysis*: The **opportunity costs should be covered by the incremental revenue**. A price which results in an incremental revenue which in turn merely covers the incremental costs is not sufficient. If the opportunity foregone is greater than incremental revenue, the decision is not sound.
4. *Time factor analysis*: The decision should **take into account the short run and long run effects**. A high price may increase its immediate profits but may lead to loss of revenue in the long run owing to competitors snatching the business.
5. *CVP analysis*: In fixing prices consideration should be given to **price volume relationship**. The responsiveness of the market to the price should be such that the volume is increased so that fuller utilisation of plant is achieved.
6. *Risk analysis*: Consideration should also be given to the evaluation of uncertainty. The decision taken should be able to maximise the expected value.

4.6 Price discounts and differentials

4.6.1 *Distributors' discounts*: It means price deductions that systematically make the net price vary according to buyer's position in the chain of distribution. These discounts are given to various distributors in the trade channel e.g., wholesalers, dealers and retailers.

4.6.2 *Quantity discounts*: Quantity discounts are price reductions related to the quantities purchased. It may take several forms. It may be related to the size of the order which is being measured in terms of physical units of a particular commodity.

4.6.3 *Cash Discounts*: Cash discounts are price reductions based on promptness of payment. It is a convenient device to identify and overcome bad credit risks.

4.6.4 Time differentials: Charging different prices on the basis of time is another kind of price discrimination.

Time differentials can be classified under the following heads.

- (i) *Clock-time differentials*: The price differentials are known as clocktime differentials when different prices are charged for the same service or commodity at different times within a 24 hour period.
- (ii) *Calendar-time differentials*: Here price differences are based on a period longer than 24 hours.
- iii) *Geographical price differentials*: It refers to price differentials based on buyers location.

(iv) *Consumer category price differentials*: Price discriminations is frequently practised according to consumer categories in the case of public utilities,

4.7 Price Discrimination: Price discrimination means charging different prices and it takes various forms according to whether the basis is customer, product, place or time. These are illustrated as under:

4.7.1 *Price discrimination on the basis of customer*: In this case, the same product is charged at different prices to different customers. It is, however, potentially disruptive of customer relations.

4.7.2 *Price discrimination based on product version*: In this case, a slightly different product is charged at a different price regardless of its cost-price relationship. If, for example, a table with wooden top can be sold at Rs. 400, a table with sunmica top costing Rs. 175 extra is sold at Rs. 575. The higher premium in the latter case does not necessarily reflect the higher production cost.

4.7.3 *Price discrimination based on place*: An example of this method is the seats in cinema theatre where the front seats are charged at lower rates than the back seats.

4.7.4 *Price discrimination based on time*: An example of this method is the practice of giving off-season concession in sale of fans or refrigerators just after the summer season.

4.8 Geographic Pricing Strategies:

In pricing, a seller must consider the costs of shipping goods to the buyer. These costs grow in importance as freight becomes a larger part of total variable costs. It includes:

4.8.1 *Point-of-Production Pricing*: In a widely used geographic pricing strategy, the seller quotes the **selling price at the point of production** and the buyer selects the mode of transportation and pays all freight costs.

4.8.2 *Uniform Delivered Pricing*: Under uniform delivered pricing, **the same delivered price is quoted to all buyers regardless of their locations**.

4.8.3 *Zone-Delivered Pricing*: Zone-delivered pricing divides a seller's market into a limited number of broad geographic zones and then sets a uniform delivered price for each zone.

4.8.4 *Freight-Absorption Pricing*: Under freight-absorption pricing, a manufacturer will quote to the customer a delivered price equal to its factory price **plus the freight costs that would be charged by a competitive seller located near that customer**.

CVP ANALYSIS & DECISION MAKING

Question 1

Enumerate the *limitations* of using the marginal costing technique.

Answer

Marginal costing is defined as the ascertainment of marginal cost and of the effect on profit of changes in volume or type of output by differentiating between fixed costs and variable costs.

Limitations of Marginal Costing Techniques:

1. It is *difficult to classify exactly the expenses into fixed and variable category*. Most of the expenses are neither totally variable nor wholly fixed.
2. Contribution itself is not a *guide unless it is linked with the key factor*.
3. Sales staff may mistake marginal cost for total cost and sell at a price; which will result in loss or low profits. Hence, *sales staff should be cautioned while giving marginal cost*.
4. Overheads of fixed nature cannot altogether be excluded particularly in large contracts, while valuing the work-in-progress. In order to show the correct position fixed overheads have to be included in work-in-progress.
5. *Some of the assumptions regarding the behaviour of various costs are not necessarily true* in a realistic situation. For example, the assumption that fixed cost will remain static throughout is not correct.

Question 2

Briefly discuss on *curvilinear* CVP analysis.

Answer

In CVP analysis, the usual assumption is that the total sales line and variable cost line will have linear relationship, that is, these lines will be straight lines. However, in actual practice *it is unlikely to have a linear relationship* for two reasons, namely:

- after the saturation point of existing demand, the sales value may show a downward trend.
- the average unit variable cost declines initially, reflecting the fact that, as output increase the firm will be able to obtain bulk discounts on the purchase of raw materials and can also benefit from division of labour. When the plant is operated at further higher levels of output, due to bottlenecks and breakdowns the variable cost per unit will tend to increase. Thus the law of increasing costs may operate and the variable cost per unit may increase after reaching a particular level of output. In such cases, the contribution will not increase in linear proportion i.e. based on the phenomenon of diminishing marginal productivity; the total cost line will not be straight, as assumed but will be of curvilinear shape. *This situation will give rise to two break even points. The optimum profit is earned at the point where the distance between sales and total cost is the greatest.*

Question 4

"Use of absorption costing method for the valuation of finished goods inventory provides incentive for over-production." Elucidate the statement.

Answer

When absorption costing method is used, production fixed overheads are charged to products and are included in product costs. Consequently, the closing stocks are valued on total cost (including fixed overheads) basis. The net effect is that the charge of fixed overheads to P/L account gets reduced, if the closing stock is greater than the opening stock. This situation has the effect of inflating the profit for the period. Where stock levels are likely to fluctuate significantly, profits may be distorted if calculated on absorption costing basis. If marginal costing is used, since the fixed costs are charged off to P/L account as period cost, such a situation will not arise. The impact of using absorption costing on profits can be summarised as under:

- When sales are equal to production, profits will be the same under absorption costing and marginal costing.
- If production is higher than sales, the absorption costing will post higher profits than marginal costing.
- If sales are in excess of production, absorption costing will show lower profits than marginal costing.

Since profit calculation in absorption costing can produce strange result, the managers may deliberately alter the stock levels to influence the profits if absorption costing is used. Hence, it is true to say that if absorption costing method is used managers have the incentive to over produce to show better result.

Question 8

State the non-cost factors to be considered in make/buy decisions. (May 2001)

Answer

Non-cost factors in make / buy decisions:

1. Possible use of released production capacity and facility as a result of buying instead of making.
2. Sources of supply should be reliable and they are capable of meeting un-interruptedly the requirement of the concern.
3. Assurance about the quality of goods supplied by outside supplier.
4. Reasonable certainty, from the side of supplier about, meeting the delivery dates.
5. The decision of buying the product / component from outside suppliers should be discouraged, if the technical know how used is highly secretive.
6. The decision of buying from outside sources should not result in the laying off of workers and create industrial relation problems. In fact, on buying from outside the resources freed should be better utilised else where in the concern.
7. The decision of manufacturing product / component should not adversely affect the concern's relationship with suppliers.
8. Ensure that more than one supplier of product/component is available to reduce the risk of outside buying.

9. In case the necessary technical expertise is not available internally then it is better to buy the requirements from outside.

Question 10

Enumerate the factors involved in decisions relating to expansion of capacity (May 2001)

Answer

The factors involved in decisions relating to expansion of capacity are enumerated as below:

- (i) Additional fixed overheads involved should be considered.
- (ii) Possible decrease in selling price due to increased production capacity.
- (iii) Whether the demand is sufficient to absorb the increased production.

Question 13

Discuss the role of costs in product-mix decisions. (Nov 2001)

Answer

All types of cost involved in cost accounting system are useful in decision making. The cost which plays a major role in product mix decision is the relevant cost. Costs to be relevant should meet the following criteria:

- (i) The costs should be expected as future costs.
- (ii) The costs differ among the alternatives course of action.

While making decision about product mix using the facilities and other available resources, the end results should always aim at cost minimisation. Variable costs are relevant costs in product mix decisions and consequently contribution plays a major role in minimisation of cost.

In addition to the relevancy of costs, the other factors and costs that should be taken into account at the time of deciding the products mix are:

- (i) The available production capacity
- (ii) The limiting factor (s)
- (iii) Contribution per unit of the limiting factor
- (iv) Market demand for the products.
- (v) Opportunity costs

Question 15

State the relative economics of the “makes vs. buy” decision in management control. (Nov 2001)

Answer

The relative economics of the “make vs. buy” decision is management control:

Generally for taking a make vs. buy decision comparison is made between the supplier's price and the marginal cost of making plus the opportunity cost. Make vs. buy decision is a strategic decision, and, therefore, both short-term as well as long-term thinking about various cost and other aspects needs to be done.

A company generally buys a component instead of making it under following situations:

1. If it costs less to buy rather than to manufacture it internally;
2. If the return on the necessary investment to be made to manufacture is not attractive enough;
3. If the company does not have the requisite skilled manpower to make;
4. If the concern feels that manufacturing internally will mean additional labour problem;
5. If adequate managerial manpower is not available to take charge of the extra work of manufacturing;
6. If the component shows much seasonal demand resulting in a considerable risk of maintaining inventories;
7. If transport and other infrastructure facilities are adequately available;
8. If the process of making is confidential or patented;
9. If there is risk of technological obsolescence for the component such that it does not encourage capital investment in the component.

Question 30

What are the major areas of decision-making in which differential costing is used?

(May 2008, 4 Marks)

Answer

Differential costing can be used for all short, medium and long term decisions. When two levels of activities are being considered, or while choosing between competing alternatives differential cost analysis is essential. The differential cost is useful for decision making in the following areas:

- ◆ Capital expenditure decisions
- ◆ Make or buy decision
- ◆ Production planning
- ◆ Sales mix decision
- ◆ Production or product decision
- ◆ Change in level or nature of an activity.

Question 32

State the characteristic features of a database created for operational control and decision making.

(Nov 2008, 4 Marks)

Answer

The characteristic features of a data-base created for operational control and decision making are as under:

- (i) There should be a file structure that facilitates the association of one internal record with other internal records.
- (ii) There should be cross functional integration of files.
- (iii) Independence of program / data file for ease of updating and maintenance of data base.
- (iv) There must be common standards throughout with respect to data definitions, record formats and other data descriptions.
- (v) A data dictionary should be available.

Question 8

“Cost is not the only criterion for deciding in favour of shut down” – Briefly explain. (May 2000)

Cost is not the only criterion for deciding in favour of shut down. Non-cost factors worthy of consideration in this regard are:

1. Interest of the workers —if the workers are discharged it may become difficult to get skilled workers later, on reopening of the factory. Also shut down may create problem for the workers which may far exceed the cost benefits of the shut down.
2. Once the firm is closed down competitors may establish their products and thus it may be difficult to introduce the product in the market again.
3. The plant may become obsolete or depreciate at a larger rate when not in operation. Thus, heavy capital expenditure may have to be incurred on re-opening.

3.3.1 Pricing in periods of recession :

In periods of recession, a firm may sell its articles at a price *less than the total cost but above the marginal cost* for a limited period.

The advantages of this practice are:

- (i) The firm can continue to produce and use the services of skilled employees who are well trained and will be difficult to re-employ later if discharged.
- (ii) Plant and machinery can be prevented from deterioration through idleness.
- (iii) The business would be ready to take advantage of improved business conditions later.
- (iv) This avoids the competition of securing the business of the firm.

COST CONCEPTS IN DECISION MAKING

Question 1

Explain briefly the concepts of Opportunity costs and Relevant costs.

Answer

Opportunity cost is a measure of the benefit of opportunity forgone when various alternatives are considered. In other words, it is the cost of sacrifice made by alternative action chosen. For example, opportunity cost of funds invested in business is the interest that could have been earned by investing the funds in bank deposit.

Relevant Cost: Expected future costs which differ for alternative course. It is not essential that all variable costs are relevant and all fixed costs are irrelevant. Fixed, or variable costs that differ for various alternatives are relevant costs. Relevant costs draw our attention to those elements of cost which are relevant for the decision.

E.g. Direct labour under alternative I – Rs.10/ hour

Direct labour under alternative II – Rs.20/hour

Then, direct labour is relevant cost.

Question 4

Distinguish between "Marginal cost" and "Differential Cost".

Answer

Marginal cost represents the increase or decrease in total cost which occurs with a small change in output say, a unit of output. In Cost Accounting variable costs represent marginal cost. Differential cost is the change (increase or decrease) in the total cost (variable as well as fixed) due to change in the level of activity, technology or production process or method of production.

In other words, it can be defined as the cost of one unit of product or service which would be avoided if that unit was not produced or provided. The main point which distinguishes marginal cost and differential as that change in fixed cost when volume of production increases or decreases by a unit of production. In the case of differential cost variable as well as fixed cost. i.e. both costs change due to change in the level of activity, whereas under marginal costing only variable cost changes due to change in the level of activity.

Question 5

What are the applications of incremental cost techniques in making managerial decisions?

Answer

Incremental cost technique: It is a technique used in the preparation of ad-hoc information in which only cost and income differences between alternative courses of action are taken into consideration. This technique is applicable to situations where fixed costs alter. The essential pre-requisite for making managerial decisions by using incremental cost technique, is to compare the incremental costs with incremental revenues. So long as the incremental revenue is greater than incremental costs, the decision should be in favour of the proposal.

Applications of incremental cost techniques in making managerial decisions

The important areas in which incremental cost analysis could be used for managerial decision making are as under:

- (i) Introduction of a new product
- (ii) Discontinuing a product, suspending or closing down a segment of the business
- (iii) Whether to process a product further or not
- (iv) Acceptance of an additional order from a special customer at lower than existing price
- (v) Opening of new sales territory and branch.
- (vi) Optimizing investment plan out of multiple alternatives.
- (vii) Make or buy decisions
- (viii) Submitting tenders
- (ix) Lease or buy decisions
- (x) Equipment replacement decisions

Question 10

Explain with one example each that sunk cost is irrelevant in making decisions, but irrelevant costs are not sunk costs. (May 2001)

Answer

Sunk cost is a historical cost incurred in the past. In other words it is a cost of a resource already acquired. Future decisions in respect of this resource will not be affected by it. For example, book value of machinery. Hence sunk costs are irrelevant in decision making. Irrelevant costs are not necessary sunk costs. For example, when a comparison of two alternative production methods using the same material quantity is made, then direct material cost is not affected by the decision but this material cost is not sunk cost.

Question 13

Explain the concept of relevancy of cost by citing three examples each of relevant costs and non-relevant costs.

Answer

Relevant costs are those costs which are pertinent to a decision. In other words, these are the costs which are influenced by a decision. Those costs which are not affected by the decision are not relevant costs.

Examples of relevant costs are:

- (1) All variable costs are relevant costs.
- (2) Fixed Costs which vary with the decision are relevant costs.
- (3) Incremental costs are relevant costs.

Examples of non-relevant costs:

- (1) All fixed costs are generally non-relevant.
- (2) Variable costs which do not vary with the decision are not relevant costs.
- (3) Book value of the asset is not relevant.

Question 6

Mention any four important factors to be considered in Marginal Costing Decisions. (Nov 1999)

Answer

Important factors to be considered in “Marginal Costing Decisions” are as follows:

- (i) Whether the product or production makes a contribution,
- (ii) In the selection alternatives, additional fixed costs if any should be considered.
- (iii) The continuity of demand after expansion and its impact on selling price are to be considered.
- (iv) Non-cost factors such as the need to keep labour force intact and governmental attitude are also to be taken into account.

Question 4

(a) Explain the concept of discretionary costs. Give three examples.

(b) Discuss, how control may be exercised over discretionary costs. (Nov 1999)

Answer

(a) Discretionary costs can be explained with the help of following two important features

- (i) They **arise from periodic** (usually yearly) **decisions regarding** the maximum outlay to be incurred.
- (ii) They are **not tied to a clear cause and effect relationship** between inputs and outputs.

Examples of discretionary costs includes: advertising, public relations, executive training, teaching, research, health care and management consulting services.

The note worthy feature of discretionary costs is that managers are seldom confident that the “correct” amounts are being spent.

(b) Control over discretionary costs : To control discretionary costs control points/parameters may be established. But these points need to be devised individually. For research and development function to control discretionary costs, dates may be established for submitting major reports to management. For advertising and sales promotion, such costs may be controlled by pre-setting targets. In the case of employees benefits, discretionary costs may be controlled by calling a meeting of employees union and making them aware that the company would meet only the fixed costs and the variable costs should be met by them.

Question 15

How has the composition of manufacturing costs changed during recent years? How has this change affected the design of cost accounting systems?

Answer

Traditionally, manufacturing companies classified the manufacturing costs to be allocated to the products into (a) direct materials. (b) direct labour and (c) indirect manufacturing costs. In the present day context, characterised by intensive global competition, large scale automation of manufacturing process , computerization and product diversification to cater to the changing consumer tastes and preferences has forced companies to refine their costing systems to provide better measurement of the overhead costs used by different cost objects.

Accordingly, manufacturing costs are classified in to three broad categories as under:

1. *Direct cost*: As many total costs relating to cost objects as feasible are classified into direct cost. The objective is to trace as many costs as possible in to direct and to reduce the amount of costs classified into indirect because the greater the proportion of direct costs the greater the accuracy of the cost system.
2. *Indirect cost pools*: Increase the number of indirect cost pools so that each of these pools is more homogeneous. In a homogeneous cost pool, all the costs will have the same cause-and-effect relationship with the cost allocation base.
3. Use cost-and-effect criterion for identifying the cost allocation base for each indirect cost pool.

The change in the classification of manufacturing costs as above has lead to the development of Activity Based Costing (ABC). Activity Based Costing refines a costing system by focusing on individual activities as the fundamental cost objects. An activity is an event, task or unit of work with a specified purpose as for example, designing, set up, etc. ABC system calculates the costs of individual activities and assigns costs to cost objects such as products or services on the basis of the activities consumed to produce the product or provide the service.

Out of pocket costs:

This is that portion of costs which involves payments to outsiders i.e., it gives rise to cash expenditure as opposed to such costs as depreciation, which do not involve any cash expenditure. Such costs are relevant for price fixation during recession or when make or buy decisions are to be made. These costs include cost incurred under some heads for which separate cost accounting records are not maintained and they are sometimes termed as miscellaneous cost.

DEVELOPMENTS IN THE BUSINESS ENVIRONMENT

Question 1

Define Total Quality Management? What are the six Cs for successful implementation of TQM?

Answer

The total quality management is a set of concepts and tools for getting all employees focused on continuous improvement in the eyes of the customer. Quality is an important aspect of world-class manufacturing. The success of Japanese companies is grass rooted in their long term commitment to improvement of quality. A world class manufacturing approach demands that the quality must be designed into product and the production process, rather than an attempt to remove poor quality by inspection. This means that the objectives of quality assurance in a world- class-manufacturing environment, is not just reject defective product, but to systematically investigate the cause of defects so that they can be gradually eliminated. Though the goal is zero defect, the methodology is one of continuous improvement.

Six Cs of TQM

- (i) Commitment - If a TQM culture is to be developed, so that quality improvement becomes normal part of everyone's job, a clear commitment, from the top must be provided. Without this all else fails.
- (ii) Culture - Training lies at the centre of effecting a change -in culture and attitudes. Negative perceptions must be changed to encourage individual contributions.
- (iii) Continuous improvement - TQM is a process, not a program, necessitating that we are committed in the long term to the never ending search for ways to do the job better.
- (iv) Co-operation: The on-the-job experience of all employees must be fully utilized and their involvement and co-operation sought in the development of improvement strategies and associated performance measures.
- (v) Customer focus: Perfect service with zero defects in all that is acceptable at either internal or external levels.
- (vi) Control: Documentation, procedures and awareness of current best practice are essential if TQM implementations are to function appropriately The need for control mechanisms is frequently overlooked, in practice.

Question 4

Discuss the benefits accruing from the implementation of a Total Quality Management programme in an organization. (Nov 2008, 4 Marks)

Answer

The benefits accruing from the implementation of a Total Quality Management programme in an organisation are:

- (i) There will be increased awareness of quality culture in the organization.
- (ii) It will lead to commitment to continuous improvement.
- (iii) It will focus on customer satisfaction.
- (iv) A greater emphasis on team work will be achieved.

Question 6

What are the critical success factors for the implementation of a "Total Quality Management" programme?

Answer

Critical success factors of TQM:

- Focus on customer needs.
- Everyone in the organisation should be involved.
- Focus on continuous improvement.
- Design quality in product and production process.
- Effective performance measurement system.
- Rewards and performance measurements should be renewed.
- Appropriate training and education to everyone to understand the aim of TQM.

Question 7

Explain four P's of quality improvement principles.

Answer

The Four P's quality improvement principles are as below:

1. *People*: It will quickly become apparent that some individuals are not ideally suited to the participatory process. Lack of enthusiasm will be apparent from a generally negative approach and a tendency to have prearranged meeting which coincide with the meetings of TOM teams.
2. *Process*: The rhetoric and inflexibility of a strict Deming approach will often have a demotivating effect on group activity.
3. *Problem*: Experience suggests that the least successful groups are those approaching problems that are deemed to be too large provide meaningful solutions within a finite time period.
4. *Preparation*: A training in the workings of Deming- like processes is an inadequate preparation for the efficient implementation of a quality improvement process.

Question 12

"Cost can be managed only at the point of commitment and not at the point of incidence. Therefore, it is necessary to manage cost drivers to manage cost." Explain the statement with reference to structural and executional cost drivers.

Answer

A firm commits costs at the time of designing the product and deciding the method of production. It also commits cost at the time of deciding the delivery channel (e.g. delivery through dealers or own retail stores). Costs are incurred at the time of actual production and delivery. Therefore, no significant cost reduction can be achieved at the time when the costs are incurred. Therefore, it is said that costs can be managed at the point of commitment. Cost drivers are factors that drive consumption of resources. Therefore, management of cost drivers is essential to manage costs. Structural cost drivers are those which can be managed by effecting structural changes. Examples of structural cost drivers are scale of operation, scope of operation (i.e. degree of vertical integration), complexity, technology and experience or learning. Thus, structural cost drivers arise from the business model adopted by the company. Executional cost drivers can be managed by executive decisions, examples of executional cost

drivers are capacity utilization, plant layout efficiency, product configuration and linkages with suppliers and customers. It is obvious that cost drivers can be managed only at the point of structural and operating decisions, which commit resources to various activities.

Question 13

What is the fundamental difference between Activity Based Costing System (ABC) and Traditional Costing System? Why more and more organisations in both the manufacturing and non-manufacturing industries are adopting ABC?

Answer

In the traditional system of assigning manufacturing overheads, overheads are first allocated and apportioned to cost centres (production and support service cost centres) and then absorbed to cost objects (e.g. products). Under ABC, overheads are first assigned to activities or activity pools (group of activities) and then they are assigned to cost objects. Thus, ABC is a refinement over the traditional costing system. Usually cost centres include a series of different activities. If different products create different demands on those activities, the traditional costing system fails to determine the product cost accurately. In that situation, it becomes necessary to use different rates for different activities or activity pools. The following are the reasons for adoption of ABC by manufacturing and nonmanufacturing industries:

- (i) Fierce competitive pressure has resulted in shrinking profit margin. ABC helps to estimate cost of individual product or service more accurately. This helps to formulate appropriate marketing / corporate strategy.
- (ii) There is product and customer proliferation. Demand on resources by products / customers differ among product / customers. Therefore, product / customer profitability can be measured reasonably accurately, only if consumption of resources can be traced to each individual product / customer.
- (iii) New production techniques have resulted in the increase of the proportion of support service costs in the total cost of delivering value to customers. ABC improves the accuracy of accounting for support service costs.
- (iv) The costs associated with bad decisions have increased substantially.
- (v) Reduction in the cost of data processing has reduced the cost of tracking resources consumption to large number of activities.

Question 1

What is activity based costing? (May 2000)

Answer

Activity based costing: It focuses on activities as the fundamental cost objects and uses the costs of these activities as building blocks for compiling the costs of other objects. According to CIMA, it is defined as "Cost attribution to cost units on the basis of benefits received from indirect activities i.e. ordering, setting-up, assuring quality etc". Under activity based costing costs are accumulated for each activity as a separate cost object. The collected costs are applied to products based on the benefits received from various activities. The final product costs are built up from the costs of the specific activities undergone. In the first stage the activity driven overhead cost is charged to activity based cost

pools and in the second stage cost driver based rates are derived to charge cost to product lines. The cost driver based rates are based on activities. Activities based costing can be used for:

- (a) Pricing of products;
- (b) Design and development of new products.

Question 2

What are the areas in which activity based information is used for decision making? (Nov 2000)

Answer

The areas in which Activity based information is used for making are as under:

- (i) Pricing
- (ii) Market segmentation and distribution channels
- (iii) Make-or-buy decisions and outsourcing
- (iv) Transfer pricing
- (v) Plant closed down decisions
- (vi) Evaluation of offshore production
- (vii) Capital Investment decisions
- (viii) Product line profitability.

Question 7

How ABC system supports corporate strategy?

Answer

ABC supports corporate strategy in many ways such as:

- ◆ ABC system can effectively support the management by furnishing data, at the operational level and strategic level. Accurate product costing will help the management to compare the profits of various customers, product lines and to decide on price strategy etc.
- ◆ Information generated by ABC system can also encourage management to redesign the products.
- ◆ ABC system can change the method of evaluation of new process technologies, to reduce setup times, rationalization of plant lay out in order to reduce or lower material handling cost, improve quality etc.
- ◆ ABC system will report on the resource spending.
- ◆ ABC analysis helps managers' focus their attention and energy on improving activities and the actions allow the insights from ABC to be translated into increased profits.
- ◆ Performance base accurate feedback can be provided to cost centre managers.
- ◆ Accurate information on product costs enables better decisions to be made on pricing, marketing, product design and product mix.

Question 8

Value-added and Non-value-added activities.

Answer

A value added activity is an activity that customers perceive as adding usefulness to the product or service they purchase. In other words, it is an activity that, if eliminated, will reduce the actual utility or usefulness which customers obtain from using the product or service. For example, painting a car in a

company manufacturing cars or a computer manufacturing company making computers with preloaded software.

A non-value added activity is an activity where there is an opportunity of cost reduction without reducing the product's service potential to the customer. In other words, it is an activity that, if eliminated, will not reduce the actual or perceived value that customers obtain by using the product or service. For example, storage and moving of raw materials, reworking or repairing of products, etc.

Value-added activities enhance the value of products and services in the eyes of the organisation's customers while meeting its own goals. Non-value added activities on the other hand do not contribute to customer-perceived value.

Question 19

What is the concept of 'Value-chain' and why is it important for Cost Management?

Answer

Value chain is the linked set of value creating activities from the basic raw materials and components sources to the ultimate end use of the product or service delivered to the customer.

The six business functions contained in the value chain are (i) Research and Development, (ii) Design (iii) Production (iv) Marketing (v) Distribution and (vi) Customer service.

The objective of value chain is to serve as means of increasing the customer satisfaction and managing costs effectively. Coordination of the individual parts of the value chain activities creates conditions to improve customer satisfaction in terms of cost efficiency, quality and delivery. A firm which performs value chain activities more efficiently and at a lower cost than its competitors will be able to gain competitive advantage. The following methodology should be adopted.

1. The firm should identify the industry value chain and then assign costs, revenues and assets to value activities.
2. Diagnose the cost drivers regulating each value activity.
3. Develop sustainable cost advantage either by controlling cost drivers better than competitors or by reconfiguring the chain value.

By analyzing costs, revenues and assets in each activity systematically a company can achieve low cost. Thus value chain helps managers in deciding how to apply the organization's valuable physical and human resources to each linked process so as to achieve cost effectiveness.

Question 21

How can value analysis achieve cost reduction?

Answer

Value analysis can do cost reduction in the following manner:

- By identifying and removing unnecessary components in a product which had utility earlier.
- By introducing component substitution at a lesser cost without affecting the quality of the product.
- By simplifying the product design.
- By introducing alternative methods with less cost but improved efficiency.

Question 22

Define the term 'value-chain'. Mention three 'useful strategic frameworks of the value chain analysis.

Answer

Value chain is the linked set of value-creating activities all the way from basic raw material sources for component suppliers through to the ultimate end-use product or service delivered to the customer. Porter's described the value chain as the internal processes or activities a company performs "to design, produce, market, deliver and support its product". He further stated that "a firm's value chain and the way it performs individual activities are a reflection of its history, its strategy, its approach of implementing its strategy, and the underlying economics of the activities themselves". The business activities are classified in to primary activities and support activities. Primary activities are those activities which are involved in transforming the inputs in to outputs, delivery and after sales service. Support activities are intended to support the primary activities like for example procurement, human resources management, etc.

Three useful strategic frameworks for value chain analysis are:

- Industry structure analysis;
- Core competencies; and
- Segmentation analysis.

Question 1

What steps are involved in value chain analysis approach for assessing competitive advantages?

Answer

Most corporations define their mission as one of creating products and services. In contrast, the other companies are acutely aware of the strategic importance of individual activities within their value chain, They are concentrating on those activities that allow them to capture maximum value for their customers and themselves. These firms use the value chain analysis approach to better understand which segments, distribution channels, price points, product differentiation, selling propositions and value chain configuration will yield them the greatest competitive advantage.

The way the value chain approach helps these organizations to assess competitive advantage includes the use of following steps of analysis.

- (i) Internal cost analysis - to determine the sources of profitability and the relative cost positions of internal value creating processes;
- (ii) Internal differentiation analysis - to understand the sources of differentiation with internal value-creating process; and
- (iii) Vertical linkage analysis - to understand the relationships and associated costs among external suppliers and customers in order to maximize the value delivered to customers and to minimize the cost. The value chain approach used for assessing competitive advantages is an integral part of the strategic planning process. Like strategic planning, value chain analysis is a continuous process of gathering, evaluating and communicating information for business decision-making.

Question 24

What is Target Costing? It is said that implementation of the target costing technique requires intensive marketing research. Explain why intensive marketing research is required to implement target costing technique.

Answer

Target cost is the difference between estimated selling price of a proposed product with specified functionality and quality and the target margin. This is a cost management technique that aims to produce and sell products that will ensure the target margin. It is an integral part of the product design. While designing the product, the company needs to understand what value target customers will assign to different attributes and different aspects of quality. This requires use of techniques like value engineering and value analysis. Intensive marketing research is required to understand customer preferences and the value they assign to each attribute and quality parameter. This insight is required to be developed must before the product is introduced. The company plays within the space between the maximum attributes and quality that the company can offer and the set target selling price based on customer expectations and sales forecast establish profit margin based on long-term profit objectives and projected volumes determine target (or allowable) cost per unit (target selling price less required profit establish cost reduction targets for each component and production activity, using value engineering and value analysis compare with estimate the current cost of new product minimum acceptable to target customers. Therefore in absence of intensive marketing research, the target costing technique cannot be used effectively.

Question 25

Discuss, how target costing may assist a company in controlling costs and pricing of products.

Answer

Target costing may assist control of costs and pricing of product as under:

- (i) Target costing considers the price that ought to be charged by a company to achieve a given market share.
- (ii) Target costing should take life cycle costs in to consideration.
- (iii) If there is a gap between the target cost and expected cost, ways and means of reducing or eliminating it can be explored.
- (iv) The target cost may be used for controlling costs by comparison.

Question 26

What is total-life-cycle costing approach? What is it important?

Answer

Life cycle costing estimates, tracks and accumulates the costs over a product's entire life cycle from its inception to abandonment or from the initial R & D stage till the final customer servicing and support of the product. It aims at tracing of costs and revenues on product by product basis over several calendar periods throughout their life cycle. Costs are incurred along the product's life cycle starting from product's design, development, manufacture, marketing, servicing and final disposal. The objective is to accumulate all the costs over a product life cycle to determine whether the profits earned during the manufacturing phase will cover the costs incurred during the pre and post manufacturing stages of product life cycle.

Importance:

Product life cycle costing is important for the following reasons:

- (i) When non-production costs like costs associated with R & D, design, marketing, distribution and customer service are significant, it is essential to identify them for target pricing, value engineering and

cost management. For example, a poorly designed software package may involve higher costs on marketing, distribution and after sales service.

(ii) There may be instances where the pre-manufacturing costs like R & D and design are expected to constitute a sizeable portion of life cycle costs. When a high percentage of total life cycle costs are likely to be so incurred before the commencement of production, the firm needs an accurate prediction of costs and revenues during the manufacturing stage to decide whether the costly R & D and design activities should be undertaken.

(iii) Many costs are locked in at R & D and design stages. Locked in or Committed costs are those costs that have not been incurred at the initial stages of R & D and design but that will be incurred in the future on the basis of the decisions that have already been taken. For example, the adoption of a certain design will determine the product's material and labour inputs to be incurred during the manufacturing stage. A complicated design may lead to greater expenditure on material and labour costs every time the product is produced. Life cycle budgeting highlights costs throughout the product life cycle and facilitates value engineering at the design stage before costs are locked in.

Total life-cycle costing approach accumulates product costs over the value chain. It is a process of managing all costs along the value chain starting from product's design, development, manufacturing, marketing, service and finally disposal.

Question 27

Explain the essential features of Life-cycle costing.

Answer

Essential features of Life Cycle Costing:

Product Life Cycle costing involves:

- Tracing of costs and revenue of product over several calendar period- throughout their entire life cycle.
- Emphasis is on Cost and revenue accumulation over the entire life cycle of the product.
- Life cycle costing traces research and design.
- It focuses on development costs, incurred to individual products over their entire life cycles.
- Total magnitude of research and development costs are reported and compared with product revenues generated in later periods.

Question 28

Meena is a news reporter and feature writer for an economic daily. Her assignment is to develop a feature article on 'Product Life-cycle Costing', including interviews with the Chief Financial Officers (CFO) and operating, managers. Meena has been given a liberal budget for travel so as to research into company's history, operations, and market analysis for the firm she selects for the article.

Required:

(i) Meena has asked you to recommend industries and firms that would be good candidates for the article. What would you advice? Explain your recommendations. (June 2009, 3 Marks)

Answer

The product life cycle spans the time from the initial R & D on a product to when customer service and support is no longer offered for that product. Life Cycle Costing technique is particularly important when:

- (a) High percentage of total life-cycle costs are incurred before production begins and revenue are earned over several years and
- (b) High fraction of the life cycle costs are locked in at the R & D and design stages.

Meena should identify those industries and then companies belonging to those industries where above mentioned feature are prevalent. For example, Automobile and Pharmaceutical Industries companies like Tata Automobile, M&M, Ranbaxy and Dabur will be good candidates for study on product life cycle costing.

Question 1

What is Target Costing and what are the stages to the methodology ? (Nov 2000)

Answer

Target Costing: It is a management tool used for reducing a product cost over its entire life cycle. It is driven by external Market factors. Marketing management prior to designing and introducing a new product determines a target market price. This target price is set at a level that will permit the company to achieve a desired market share and sales volume. A desired profit margin is then deducted to determine the target maximum allowable product cost. Target costing also develops methods for achieving those targets and means to test the cost effectiveness of different cost-cutting scenarios. Stages to the methodology.

1. Conception (planning) Phase: Under this stage of life cycle, competitors products are to be analysed, with regard to price, quality, service and support, delivery and technology. The features which consumers would like to have like consumer value etc. established. After preliminary testing, the company may be asked to pinpoint a market niche, it believes, is under supplied and which might have some competitive advantage.
2. Development phase: The design department should select the most competitive product in the market and study in detail the requirement of material, manufacturing process along with competitors cost structure. The firm should also develop estimates of internal cost structure based on internal cost of similar products being produced by the company. If possible the company should develop both the cost structures (competitors and own) in terms of cost drivers for better analysis and cost reduction.
3. Production phase: This phase concentrates its search for better and less expensive products, cost benefit analysis in different features of a product priority wise, more towards less expensive means of production, as well as production techniques etc.

Question 2

What is Product Life-cycle Costing ? Describe its characteristics and benefits.(5 Marks)

Product life cycle costing.

It is an approach used to provide a long-term picture of product line profitability, feedback on the effectiveness of the life cycle planning and cost data to clarify the economic impact on alternatives choices in the design, engineering phase etc. It is also considered as a way to enhance the control of manufacturing costs. It is important to track and measure costs during

each stage of a product's life cycle.

Characteristics:-

- (i) Product life cycle costing involves tracing of costs and revenues of each product over the several calendar periods throughout their entire life cycle.
- (ii) Product life cycle costing traces research and design and development costs and total magnitude of these costs for each individual product and compared with product revenue.
- (iii) Report generation for costs and revenues.

Benefits: -

- (i) The product life cycle costing results in earlier actions to generate revenue or to lower cost than otherwise might be considered.
- (ii) Better decision should follow from a more accurate and realistic assessment of revenues and costs, at least within a particular life cycle stage.
- (iii) Product life cycle thinking can promote long-term rewarding in contrast to short-term profitability rewarding.
- (iv) It provides an overall framework for considering total incremental costs over the life span of a product.

Question 5

What is product life cycle costing? What are the costs that you would include in product life cycle cost?
(May 2007, 4 Marks)

Answer

Product life cycle costing traces costs and revenues of each product over several calendar periods throughout their entire life cycle.

The costs are included in different stages of the product life cycle.

Development phase – R & D cost / Design cost.

Introduction phase – Promotional cost / Capacity costs.

Growth phase / Maturity – Manufacturing cost / Distribution costs / Product support cost.

Decline / Replacement phase – Plants reused / sold / scrapped / related costs

Question 7

Discuss, how target costing may assist a company in controlling costs and pricing of products.
(Nov 2008, 4 Marks)

Answer

Target costing may assist control of costs and pricing of product as under:

- (i) Target costing considers the price that ought to be charged by a company to achieve a given market share.
- (ii) Target costing should take life cycle costs in to consideration.
- (iii) If there is a gap between the target cost and expected cost, ways and means of reducing or eliminating it can be explored.
- (iv) The target cost may be used for controlling costs by comparison

Question 30

How does the JIT approach help in improving an organisation's profitability?

Answer

JIT approach helps in the reduction of costs/increase in prices as follows:

- (i) Immediate detection of defective goods being manufactured so that early correction is ensured with least scrapping.
- (ii) Eliminates/reduces WIP between machines within working cell.
- (iii) OH costs in the form of rentals for inventory, insurance, maintenance costs etc. are reduced.
- (iv) Higher product quality ensured by the JIT approach leads to higher premium in the selling price.
- (v) Detection of problem areas due to better pdn/scrap reporting/labour tracing and inventory accuracy lead to reduction in costs by improvement.

Question 31

Explain, how the implementation of JIT approach to manufacturing can be a major source of competitive advantage.

Answer

JIT provides competitive advantage in the following ways:

- (i) Stocks of raw materials and finished goods are eliminated, stock holding costs are avoided.
- (ii) JIT aims at elimination of non-value added activities and elimination of cost in this direction will improve competitive advantage.
- (iii) It affords flexibility to customer requirements where the company can manufacture customized products and the competitive advantage is thereby improved.
- (iv) It focuses the direction of performance based production of high quality product.
- (v) It minimize waiting times and transportation costs.

Question 33

Describe the Just-in-time systems.

Answer

A complete JIT system begins with production, includes deliveries to a company's production facilities, continues through the manufacturing plant and even includes the types of transactions processed by the accounting system.

- (i) The company must ensure that it receives its supplies on time, preferably directly at the production facility that needs them. The company engineers must assist suppliers at their premises and ensure defect free supplies. Thus raw material inventory is reduced if correct quantities are delivered as per production schedules.
- (ii) Long set-up times are reduced into short ones by eliminating inefficiency. Thus the WIP is reduced and so is the number of products before defects are identified.
- (iii) A 'Kanban' card, which authorizes production of the right quantity by its feeder machine ensures 'pulling' the production process and elimination of inventory. Another method is the introduction of a working cell, which is a cluster of machines run by a single trained operator. This also identifies defects quickly and reduces maintenance costs. Both methods are used together.

- (iv) Work force is trained to be empowered to halt operations understand more about the system, product flow, different machines and thus, elaborate reporting of a past variance is eliminated.
- (v) Suppliers may be paid based on production units adjusted for defects.

Question 34

What do you mean by back-flushing in JIT system? What are the problems that must be corrected before it will work properly?

Answer

Backflushing requires no data entry of any kind until a finished product is completed. At that time the total amount finished is entered into the computer system, which multiplies it by all the components listed in the bill of materials for each item produced. This yields a lengthy list of components that should have been used in the production process and which is subtracted from the beginning inventory balance to arrive at the amount of inventory that should now be left of hand. Back the entire production process. Given the large transaction volumes associated with JIT, this is an ideal solution to the problem. The following problems must be corrected before it will work properly:

- (i) Production reporting
- (ii) Scrap reporting
- (iii) Lot tracing
- (iv) Inventory accuracy.

Question 37

What is divestment strategy? Highlight the main reasons for divestments.

Answer

Divestment Strategy:

Divestment involves a strategy of selling off or shedding business operations to divert the resources, so released, for other purposes. Selling off a business segment or product division is one of the frequent forms of divestment strategy. It may also include selling off or giving up the control over subsidiary where by the wholly owned subsidiaries may be floated as independently quoted companies.

Reason for Divestment Strategy

1. In case of a firm having an opportunity to get more profitable product or segment but have resource constraint, it may selling off it's unprofitable or less profitable division and utilized the recourse so released. Cost Benefit analysis & Capital Budgeting Method are the useful tool for analyzing this type of situation.
2. In case of purchase of new business, it may be found that some of the part of the acquired business is not upto the mark. In such type of situation disposal of the unwanted part of the business is more desirable than hold it.
3. In case where any business segment or product or subsidiary is pull down the profit of the whole organization, it is better to cut down of that operation of the product or business segment.

1.10.1 Aims of material requirement planning:

1. Determine for final products namely, what should be produced and at what time.
2. Ascertaining the required units of production of sub-assemblies.

3. Determining the requirement for materials based on an up-to-date bill of materials file (BOM).
 4. Computing inventories, WIP, batch sizes and manufacturing and packaging lead times.
 5. Controlling inventory by ordering bought-in components and raw materials in relation to the orders received or forecast rather than the more usual practice of ordering from stock-level indicators.
- Benefits : Detailed forecast of the inventory position is highlighted period by period.

1.10.2 Data requirements to operate material requirement planning system:

1. The master Production schedule: This schedule specifies the quantity of each finished unit of products to be produced, and the time at which each unit will be required.
2. The Bill of material file: The bill of material file specifies the sub-assemblies, components and materials required for each finished good.
3. The inventory file: This file maintains details of items in hand for each sub-assemblies, components and materials required for each finished goods.
4. The routing file: This file specifies the sequence of operations required to manufacture components, sub-assemblies and finished goods.
5. The master parts file: This file contains information on the production time of subassemblies and components produced internally and lead times for externally acquired items.

1.10.5 Pre-requisites for successful operation of MRP:

1. Strict adherence to the schedule : The successful operation of MRP system requires a strict adherence to the latest production and purchasing schedules. Workers must be educated to understand the importance of schedule adherence, and controls should be in place to ensure this adherence.
2. Accurate data base : Data accuracy is vital to the system. If a plan is based on inaccurate data it may be impossible to adhere to the schedule. For example, if the bill of materials file is not updated to reflect any changes in product composition it will be impossible to adhere to the schedule.

1.10.6 MRP- II

When the scope of MRP-1 is developed further which includes

1. Planning of raw material
2. planning of component & sub- assemblies
3. Compute the other resources e.g. machine or labour capacity
4. to create a full integrated plan for management

then it is known as Manufacturing resources planning (MRP – 2)

MRPII (also written MRP-2) adds the MRP schedule into a capacity planning system and then builds the information into a production schedule. It is also seen as a link between strategic planning and manufacturing control.

1.8 COMPUTER-AIDED MANUFACTURING

The manufacturing process is carried out by a range of machinery that, together with its concomitant software, comes under the collective heading of computer-aided manufacturing (CAM).

Maximum elements of CAM are computer numerical control (CNC) and robotics. CNC machines are programmable machine tools. These are capable of performing a number of machining tasks, e.g. cutting, grinding, moulding, bending etc.

A program stores all the existing manufacturing activities and set-up instructions for a particular machine or bank of machines, providing facility of changing its configuration in a matter of seconds via the keyboard; changes to existing configurations and new configurations are easily accommodated. CNC therefore offers great flexibility, and reduces set-up times. Human operators will tire and are error prone. CNC machines are able to repeat the same operation continuously in identical manner, with high accuracy level. For Example the car producer, found that the time taken to completely retool car body panel jigs in their intelligent body assembly system (IBAS) fell from 12 months to less than 3 months by reprogramming the process machinery by computer and using computerised jig robots.

1.11 SYNCHRONOUS MANUFACTURING

This concept of 'synchronous manufacturing' was started in 1984. It has been defined as: an all-encompassing manufacturing management philosophy that includes a consistent set of principles, procedures, and techniques where every action is evaluated in terms of the common global goal of the organisation.

A set of seven 'principles' are associated with synchronous manufacturing:

1. Do not focus on balance idle capacities; focus on synchronizing the production flow.
2. The marginal value of time at a bottleneck resource is equal to the throughput rate of the products processed by the bottleneck.
3. The marginal value of time at a non-bottleneck resource is negligible.
4. The level of utilization of a non-bottleneck resource is controlled by other constraints within the system.
5. Resources must be utilized, not simply activated.
6. A transfer batch may not, and many times should not, be equal to the process batch.
7. A process batch should be variable both along its route and over time.

According to synchronous manufacturing principles 2 and 3, the return on improvements at a bottleneck resource is very high. But the return on improvement made at non-bottlenecks is marginal at best. The synchronous manufacturing philosophy required managers to focus on those areas of operations where there exist potential global improvements.

1.13 THROUGHPUT ACCOUNTING

Throughput Accounting (TA) is a method of performance measurement which relates production and other costs to throughput. Throughput accounting product costs relate to usage of key resources by various products. It assumes that a manager has a given set of resources available. These comprise the existing buildings, capital equipment and labour force. Using these resources, purchased materials and components must be processed to generate sales revenue. To achieve this, maximum amount of throughput is required with the financial definition.

1.3.7 Activity Based Cost Management (ABM)

Empirical studies of ABC implementation have frequently shown that the greater benefit derived from its adoption is in Cost Management rather in providing accurate product cost. The term Activity based management (ABM) is used to describe the cost management application of ABC. The use of ABC as a costing tool to manage costs at activity level is known as Activity Based Cost Management (ABM). ABM is a discipline that focuses on the efficient and effective management of activities as the route to continuously improving the value received by customers. ABM utilizes cost information gathered through ABC. Through various analysis, ABM manages activities rather than resources. It determines what drives the activities of the organization and how these activities can be improved to increase the profitability.

1.3.7.1 Stages in Activity Based Cost Management : We have already discussed the various stages involved in activity based product costing. These stages are :

1. Identification of the activities that have taken place in the organisation.
2. Assigning costs to cost pool for each activity.
3. Spreading of support activities across the primary activities.
4. Determining cost driver for each activity.
5. Assigning the costs of activities to products according to product demand for activities.

The application of ABC as a costing tool to manage cost requires the firm to omit the final stage of assigning costs to products and adopt activity based costing without activity based product costing. Alternatively, organisation can design an activity based system and incorporates both ABM and Activity Based Product Costing.

1.3.7.4 Benefits of Activity Based Cost Management

- (i) Provision of excellent basis and focus for cost reduction.
- (ii) Provides operational management with a clear view of HOW to implement an Activity Based budget.
- (iii) Provision of clear understanding of the underlying causes of business processing costs.
- (iv) Provision of excellent basis for effectiveness of management decision making.
- (v) Identification of key process waste elements permit management prioritisation and leverage of key resources

1.3.8. Difference between ABC and ABM

The ABC refers to the technique for determining the cost of activities and the output that those activities produce. It is the logical distribution of overhead i.e. overhead should be distributed on the consumption of resources consumed by goods and services. The aim of ABC is to generate improved cost data for use in managing a company's activities. The ABM is a much broader concept. It refers to the management philosophy that focuses on the planning, execution and measurement of activities as the key to competitive advantage.

1.3.10 Activity Based Budgeting (ABB)

Activity-based budgeting is a process of planning and controlling the expected activities for the organisation to derive a cost-effective budget that meets forecast workload and agreed strategic goals. An activity-based budget is a quantitative expression of the expected activities of the firm, reflecting

management's forecast of workload and financial and non-financial requirements to meet agreed strategic goals and planned changes to improve performance.

Thus, the key elements of ABB are:

- type of work/activity to be performed;
- quantity of work/activity to be performed; and
- cost of work/activity to be performed.

ABB focuses on the activity/business processes. Resources required are determined on the expected activities and workload. The objective is to bring in efficiency into the system. So, in the process of budget preparation, many key questions, need to be addressed and properly answered