

FINAL EXAMINATION

GROUP III

(SYLLABUS 2012)

SUGGESTED ANSWERS TO QUESTIONS

DECEMBER 2015

Paper-15 : BUSINESS STRATEGY AND STRATEGIC COST MANAGEMENT

Time Allowed : 3 Hours

Full Marks : 100

The figures in the margin on the right side indicate full marks

SECTION A (50 marks)

(Business Strategy)

Questions Nos. 1 and 2 are *compulsory and each carrying 10 marks.*

Answer any two questions from the rest in this section, each carrying 15 marks.

1. Aashirvaad Ghee will make its debut in the January, 2016 as ITC plans to enter into the dairy segment. Extending the product range of its biggest non-cigarette brand, the company is looking to replicate the success it achieved in the unrecognized segment with the Aashirvaad brand. Being a household name, Aashirvaad has tremendous brand equity among households and housewives, so ITC has decided to launch ghee product under the Aashirvaad umbrella, which also provides spices and other food products. Aashirvaad is a ₹ 2,600 crore brand and controls 74% share of the country's packaged Atta market, which ITC entered in 2002, a year after getting into packaged food with ready-to-eat products. Dairy related product categories in India are in various stages of development. Now, ITC plans to extend its product portfolio to ICE-CREAM, BUTTER, CHEESE, CURD, MILK-BASED DRINKS and READY-TO-MIX items. India being the largest producer and consumer of dairy products is expected to see 15 to 16% growth with its expansion in the value added products. ITC sets to launch its first dairy product 'Aashirvaad Ghee'. ITC seeks to capitalize Aashirvaad brand name, who's spices and Atta are well known in domestic market. At the root of all, strategy lies with the ability to make good choices.
- In the above perspective:
- What are the major subjective factors to be considered by the corporate planner to take a good strategic choice decision?
 - Does the entry of ITC in Indian dairy market fulfil the key attributes of its high quality strategic choice?
3+(1+ 1 ½ × 4)

Answer:

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- (i) The following factors mostly regulate strategic choice decisions of selective measures and directly or indirectly influence the strategic choice:
- ✓ Managerial perceptions of external dependence.
 - ✓ Values, preference and managerial attitude towards risk.
 - ✓ Managerial awareness of past strategies.
 - ✓ Managerial power relationship and organization structure.
 - ✓ Influence of lower-level managers.
 - ✓ Organizational policies, culture etc.

- (ii) Good choices identify and mobilize the company towards the combination of market positioning and unique activities that represent the best scenario for where to play and how to win in a chosen market. In short, a set of good choices positions a firm for competitive advantage.

A high quality strategic choice possesses following four key attributes:

- ✓ It is genuine: The company must choose where to play (i.e. which customers are to be served and what needs to target) and where not to play and how to compete (i.e. How the firm will achieve advantage over competitors in chosen customer groups or segments of the market) and how not compete.
- ✓ It is sound: A sound choice flows logically from the accumulated facts, data, figures and beliefs of the choice makers. Sound choices neither ignore nor rest on intuition. They are the product of good logic applied to accurate data - data which is representative and robust.
- ✓ It is actionable: The choice can be easily communicated, can be broken down into series of steps to be taken immediately, and can be further broken down into long-term achievable goals and doable tasks.
- ✓ It is compelling: The choice must be sufficiently compelling to generate management commitment to the choice - not just in an abstract it makes sense kind of way, but in an engaged and energetic way. The test of a compelling choice are:

Can the management team achieve sufficient commitment to make a choice to change direction?

Can the team maintain sufficient enthusiasm to enable its employees to implement the choices?

Can the management put the strategy into action for long enough to achieve success?

In the light of the above, the ITC satisfied its four key attributes of high quality strategic choice in Indian dairy market.

2. **For more than ten years, Ananda Stores Ltd. was successfully running a number of retail stores for selling cosmetic and skincare products. Since last year sales were stagnating and now after a year it has started declining. The GM of the company made enquiries from store-in-charge of various locations of the stores. All of them reported that ladies, particularly, the younger generation, were found to be highly discriminating about choice of products. Demand for certain branded items widely fluctuated due to movie artists' performances shown on the TV. The GM decided to have an environmental analysis to be carried out with a focus on changes in social and cultural factors among urban ladies. On that basis he even thought of recommending to the Board of Directors a complete change in the product lines.**

(i) Do you think that the GM is right in his approach regarding environmental scanning?

(ii) Write the necessity of environmental analysis and its appraisal.

6+4

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Answer:

2. (i) Environmental scanning is one important function of strategic management of analyzing external factors that can affect an organization. Environmental scanning is to scan the environment to monitor and identify the changes such as new trends that may cause an effect on the organization. In addition, environmental scanning with an internal analysis of the organization's strengths, weakness, mission and vision can assist management to formulate a strategic plan to gain control that may have potentially significant effect. Environmental scanning is the acquisition and the use of information about events, trends and relationships in an organization's external environment, the knowledge of which would assist management in planning the organization's future course of action. Organizations scan the environment in order to understand the external forces of changes so that they may develop effective responses which secure or improve their position in the future. They scan in order to avoid surprises, identify threats and opportunities, gain competitive advantages and improve long-term and short-term planning to the extent that an organization's ability to adopt to its outside environment is dependent on knowing and interpreting the external changes that are taking place, environmental scanning includes both looking at information (viewing) and looking for information (searching), it could range from a casual conversation at the lunch table or a chance observation of an angry customer, to a formal market research programme or a scenario planning exercise.

In the light of the above, the GM is right in his approach regarding environmental scanning. It will help them to understand the market preference and the reason behind the declining sales.

(ii) One obvious reason as to why top management's concern is shifting from the internal affairs of the company to external environment is that the external conditions are increasingly opening up new opportunities for profit and growth and at the same time are posing major threats. The future of an organization is closely bound up with what is happening in the environment. Environmental scanning comprises information processing and forecasting of social, economic, political and even international conditions besides technological and product market conditions. This provides a broader perspective to corporate planners in formulating plans and strategies while reports on market research and economic forecast are helpful in a limited way.

The fast-changing conditions require a systematic process of scanning and diagnosis to determine the following:

- (a) What factors in the environment present threats to the company's strategy and achievement of objectives, and
- (b) What factors in the environment present opportunities for better accomplishment of objectives and whether they call for any adjustment of goal or change strategy.

3. (a) **There are increasing number of Indian companies implementing the SMART methodology for goal setting. State in brief the different meanings of goals in SMART.**

(b) What is meant by the term 'gap analysis'? What are the alternative courses of actions to be followed by a manager under 'gap analysis'?

(c) American Apparel is a fashion retailer and manufacturer that advertises itself as a vertically integrated industrial company. The brand is based in Downtown, Los Angeles, where from a single building they control the dyeing, finishing, sewing, cutting, marketing and distribution of the company's product. The shoots and distributes its own advertisements, often uses its own employees as subjects. It also owns and operates

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each of its retail location as opposed to franchising. According to the management, the integration strategy allows the company to design, cut, distribute and sell an item globally in the span of a month.

(i) Which type of 'integration strategy' is being followed by the company?

(ii) Give reasons for adopting such strategy in support of your answer. 5+(2+3)+(1+4)

Answer:

3. (a) The goals should be described accomplishments, not activities.

(i) Specific: Goal objectives should address the five Ws like who, what, when, where and why.

(ii) Measurable: Goal objectives should include numeric or descriptive measures that define quantity, quality, cost etc.

(iii) Achievable or Attainable: Goal objectives should be within the staff member's control and influence. A goal may be a 'stretch' but still 'feasible'.

(iv) Relevant or Realistic: Goal should be instrumental to the mission of the department and ultimately, the institution. Two considerations: Why is the goal setting is so important? How will the goal setting help the department achieve its objectives?

(v) Time-bound or Timely: Goal setting objectives should identify a definite target date for completion and/or frequencies for specific action steps that are important for achieving the goal.

(b) The gap analysis is defined as a technique or process in which it attempts to analyse the gap between actual performance and potential or desired performance by identifying the extent of the strategic task and its ways in which the gap might be closed. This analysis done by comparing current level of performance of the organization or SBU with the previously set goals.

When gaps are found, the manager has three alternative courses of action:

(i) Redefine and check the previous set goals and objectives;

(ii) Do nothing: This option is under-utilized by the manager, but should always be considered;

(iii) Changes the strategy: When a gap is found between the objectives and forecast or the optimized allocation and integration of inputs and the current level of allocation, the only alternative is to change the current strategy and develop a new one as the first two options have been considered and rejected also.

(c) Since the company controls both production and distribution of its product, it is an example of a balanced vertically integrated strategy.

Vertical integration is the process in which several steps in the production and/or distribution of a product or service are controlled by a single company or entity, in order to increase that company's or entity's power in the marketplace.

Vertical integration represents an expansion or extension of the firm by integrating preceding or excessive productive processes. That is, the firm incorporates more processes toward the original source of raw materials (backward integration) or toward the ultimate consumer (forward integration). For this reason the given case is an example of balanced vertical integration.

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4. (a) What is meant by 'functional Strategic leadership' in a business organization?
(b) State the objectives of 'strategic leadership'?
(c) "Organizational Political Climate is influenced by certain key powers". – Elucidate the statement?
(d) Write four applications of 'game theory' in the analysis of business decision. **3+4+4+4**

Answer:

4. (a) Strategic leadership refers to a manager's potential to express a strategic vision for the organization or a part of the organization and to motivate as well as persuade others to acquire that vision. Strategic leadership can also be defined as utilizing strategy in the management of employees. Strategic leaders make greater use of reward and incentive system for encouraging productive and quality employees to show much better performance for their organization.

Functional strategic leadership is about inventiveness, perception and planning to assist an individual in realizing his objectives and goals.

- (b) Strategic leadership provides the vision, direction, the purpose for growth and context for success of the corporation. Strategic leadership is not about micromanaging business strategies. Rather, it provides the umbrella under which business devise appropriate strategies and creates value. The main objective of the strategic leadership is strategic productivity. Another aim of strategic leadership is to develop an environment in which employees forecast the organization's needs in context of their own job. Strategic leaders encourage the employees in an organization to follow their own ideas. In short, strategic leadership answers two questions: What and How.

- (c) Organizational politics refers to the processes through which the rival interests are played out and eventually reconciled. While in an ideal organization it may be hoped that decisions are made on an rational basis, politics is inherently non-rational and subject to power interactions between diverse interests. It is through the political system of an organization that rival interests are resolved. This system represents how power is applied and distributed in the organization.

The following are the four key powers in the 'organizational political climate':

- (i) Positional power: legitimate, coercive and reward.
 - (ii) Personal power: referent, expert and charisma.
 - (iii) Informational power: formal access, informal access and output opportunity.
 - (iv) Connection power: internal networks, external networks and network centrality.
- (d) Although the application of game theory in business have been quite limited, the concepts of maxi-min, mixed strategies, game value and game classes shed lights on the competitive situations facing managers in the organization. The following specific applications are noted below:
- (i) The game theory technique is designed to evaluate situations where individuals and organizations can have conflicting objectives.
 - (ii) In wage negotiations between unions and firms, game theory could be used to analyze the bargaining process between two parties.
 - (iii) Game theory helps in determining the best course of action and for an optimal strategy for a firm in view of the expected counter moves from the competitors.
 - (iv) It can be used to analyze a broad range of activities.

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5. (a) Write the essential conditions in which the 'cost leadership business strategy' and 'differentiation business strategy' of Porter's Generic Business Level Strategy are used in business.
- (b) Mention four possible areas where 'differentiation business strategy' is applicable.
- (c) What types of risks are involved in 'focus business strategy'?
- (d) "In the maturity stage of Product Life Cycle (PLC), the market becomes saturated, price competition is intensified, and the rate of sales growth slows down." Suggest strategic choices in such a stage of the PLC. (3+3)+2+2+5

Answer:

5. (a) **Conditions under which cost leadership business strategy is used:**

- (i) The markets for the product operate in such a way that price-based competition is an important factor.
- (ii) The product is standardized and its consumption takes place in such a manner that differentiation is not required.
- (iii) The bargaining power of buyer to negotiate a price reduction is high from the supplying firm.
- (iv) There is lesser customer loyalty and the cost of switching from one seller to another is low.

Conditions under which differentiation business strategy is used:

- (i) The firm knows who are its competitors and knows all the marketing-mix.
- (ii) The market is too large and a few firms offering a standardized product.
- (iii) The customers' needs and preferences are too diversified.
- (iv) It is possible for the firm to charge a premium price for differentiation that is valued by the customers.
- (v) The nature of the product is such that brand loyalty is possible to generate and sustain.

- (b) Differentiation business strategy is possible in the following areas:

- (i) Product design;
- (ii) Quality of product;
- (iii) Technology development;
- (iv) Distribution system;
- (v) Customer services etc.

- (c) The risks involved in focus business strategy are as follows:

- (i) Target segment may disappear for some reason.
- (ii) It is difficult to identify which segments the firms should choose.

- (d) In order to face the situations characterized by the maturity stage of PLC (Product Life Cycle), alternative marketing and distribution strategies listed below are suggested:

- (i) Intensive promotion by means of -
 - ❖ Brand-stressing advertising,
 - ❖ Attractive design and functional packaging,
 - ❖ Effective after-sales services,
 - ❖ Given importance in customer loyalty.

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- (ii) Trading down through –
 - ❖ Introduction of low-priced models of existing products or services,
 - ❖ Price-cutting of entire product line.
- (iii) Trading up through -
 - ❖ Improvement of quality and appearances etc.
 - ❖ Use of prestigious packages,
 - ❖ Price increase to cream market levels.
- (iv) Proliferation, exclusive or radical by –
 - ❖ More design or varieties,
 - ❖ More exclusive and innovative features,
 - ❖ Creating radical and distinct package designs,
 - ❖ More options.
- (v) Increase of product availability and point-of-sale service through –
 - ❖ More distribution outlets,
 - ❖ More dealers,
 - ❖ More service centers.

SECTION B (50 marks)

(Strategic Cost Management)

Questions Nos. 6 and 7 are compulsory and carrying 10 marks.

Answer any two questions from the rest in this section, each carrying 15 marks.

6. Bharti Airtel is continue to cut discounts and free offers on call rates, besides looking at raising base call rates in the coming days. "The company's consistent strategy is to cut discounted minutes on almost every opportunity, as we continue to focus on raising net realization. The company will defer touching the headline tariffs (rates) but at the same point there may be some opportunity to raise these", said Gopal Vittal, its MD and CEO (India and South Asia). Bharti, the country's largest telecom operator, with 205 million subscribers in India, has been raising rates for both voice and data services in wireless and wire line services under certain schemes by fibers. Vittal said the current levels of voice pricing were not sustainable with the raising costs of inputs-diesel, network, spectrum charges, fiber and roll-out expenses. "If I look at a secular basis over the next couple of years, there is no other option but for voice realization to go up", he added. Voice realization per minute has improved to 37p as compared to 35p four quarters earlier. Other telecom operators had also reduced discounts over the past three quarters, keeping the base rates unchanged. Reliance Communications, however, raised headline tariffs for prepaid customers by 20%.

As Management Accountant, working at Bharti Airtel, you have to develop suitable pricing strategies for the services provided by the company.

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(i) What steps you are to follow to develop a suitable pricing strategy of Bharti Airtel?

(ii) State the main approaches you will adopt for setting a basic price for the company's products or services? 5+5

Answer:

6. (i) Pricing strategies for products or services encompass following three main ways to improve profits: The business owner can –
- (a) cut cost of the product or services;
 - (b) initiate sell more of the product or services; and
 - (c) find more profit with a better pricing strategy.

One strategy does not fit all, so adopting a pricing strategy is a learning curve when studying the needs and behaviour of customers and clients. To develop a pricing strategy the first and foremost step of the business owner is to gather required data and information in the following way:

- ❖ Pricing strategies and prices of the competitor's product or services;
- ❖ Customer perception of products and services;
- ❖ Customer benefits of product and services;
- ❖ Cost of procuring, producing and generating the products or services (i.e., variable costs);
- ❖ Fixed business costs (i.e., overhead costs)

The goal is to understand your business model and operating costs as well as the current pricing strategies and price points in the marketplace.

(ii) There are three main approaches or strategies a business takes to setting price of a products or services:

(a) Cost-based pricing: Price is determined by adding a profit elements on top of the cost of making the product or services. This involves setting a price by adding a fixed amount or percentage of the cost of making or buying the products or services. After all, the customers are not too bothered what does it cost to make the product - they are mainly interested in what value the products or services provide them.

(b) Customer-based pricing: Where prices are determined by what a firm believes that customers will be prepared to pay.

The following are the customer-based pricing:

Penetration pricing - It is usually to increase the market share of a product or service.

Price skimming - It involves setting a high price before other competitors come into the market. Such products or services are often bought by "earlier adopters" who are prepared to pay higher price to have the latest or best product or service in the market.

Loss leaders - A loss leader is a product or service priced below cost-price in order to attract customers into a shop or online store. The use of loss leader pricing is a method of sales promotion.

(c) Competitor-based pricing: Where competitors' prices are the main influence on the price set. In the strong competition market, customers are faced with a wide choice of who to buy from. They may buy from the cheapest provider or perhaps from the one which offers the best customer service. But customers will certainly do the market study and be mindful of what is a reasonable or normal price of the product or service in the accessible market.

7. (a) What is meant by the term Activity Based-Cost Management (ABM)?

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(b) How the ABC information in business strategic decision is used in ABM system?

(c) Mention four applications of ABM in business.

5+3+2

Answer:

7. (a) The term Activity Based-Cost Management (ABM) is used to describe the cost management application of ABC (Activity Based Costing). 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 the competitive advantage. In other words, the use of ABC as a costing tool to manage costs at activity level is known as 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 the customer and the profit achieved by providing this value. This discipline includes cost driver analysis, activity analysis, and performance measurement. ABM recognizes that individual activities are part of wider process. Activities are grouped to form a total process.

Consortium for Advanced Management International (CAM) defines ABM as "adds a dynamic, continuous improvement dimension to the more static ABC model"

(b) ABM utilizes cost information gathered through ABC. Through various different types of 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.

ABC information can be used in an ABM system to assist in business strategic decision. Such as:

(i) Whether to continue with a particular activity?

(ii) The effect on cost structure of a change in strategy, (e.g. from mass production to smaller lot).

(iii) How changes in activities and components affect the suppliers and the value chain?

(c) The customers require - Lower costs, Higher quality, Faster response time, and Greater innovation & development of products or services. The customers perceived these needs and all of which must be satisfied simultaneously. To satisfy these needs ABM is currently being used for a variety of business applications. Such as:

(i) Cost reduction or elimination of entire activity, specially there is no value added item/activity.

(ii) Activity based budgeting or cost-effective budgeting.

(iii) Business Process Re-engineering (BPR).

(iv) Bench-marking.

(v) Activity performance measurement.

8. (a) What are the main uses of knowledge of 'learning curve' in business?

(b) Mention the names of three industries where learning curve can be applied.

(c) What is meant by the term 'industry value chain'?

(d) State two limitations of 'value chain analysis' in business.

5+3+3+4

Answer:

8. (a) Knowledge of learning curve can be useful both in planning and control. Standard cost for new operations should be revised frequently to reflect the anticipated learning pattern. Its main uses are summarized below:

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- (i) Helps to analyze Cost-Volume-Profit (CVP) relationship during familiarization phase of product or process. Learning curve can be used as a tool for forecasting.
- (ii) Helps in developing budgets and profit planning of the project.
- (iii) Helps in development of advantageous pricing policy.
- (iv) It helps design engineers in making decisions based upon expected (predictable from past experience) rates of improvement.
- (v) It is very useful to the Government in negotiations about the contracts.
- (vi) It is quite helpful in setting standards in learning phase.

(b) Learning curve can be applied in the following industries:

- (i) Learning curve theory was first developed in aircraft industry.
- (ii) It can be applied even non-production activities like marketing.
- (iii) It can be very effective in labour oriented industries.
- (iv) It can be effective with the job which is repetitive in nature particulars with same machinery and tools.

(c) Industry value chain refers to the series of activities, which add value to the product supplied to the industry. The industry value chain starts with the value crating processes of suppliers, who provide the basic raw materials and components. It continues with the value-crating processes of different classes of buyers or end-use consumers and culminates in the disposal and recycling of materials.

(d) The following are the limitations of value chain analysis:

- (i) Non-availability of data: Internal data on costs, revenues and assets used for value chain analysis are derived from financial information of a single period. For long-term strategic decision making, changes in cost structure, market prices and capital investments etc. may not be readily available.
- (ii) Identification of stages: Identifying stages in an industry's value chain is limited by the ability to locate at least one firm that participates in a specific stage. Breaking a value stage into two or more stages when an outside firm does not complete in these stages is strictly judgmental.
- (iii) Identification of cost drivers: Isolating cost drivers for each value-creating activity, identifying value chain linkages across activities and computing suppliers and customers profit margins presents serious challenges.
- (iv) Resistance from employees: Value chain analysis is not easily understandable to employees and hence may face the resistance from employees and as well as some managers also.
- (v) Ascertainment of costs, revenues and assets: There is no scientific approach and therefore much depends upon trial and error methods and experimentation methods.

9. (a) What is meant by the term 'Continuous Process Improvement (CPI)'?

(b) Write in brief the different phases which are followed in CPI process under the System Approach.

(c) The budgeted fixed overhead for the year 2015 amounted to ₹14,400. It is anticipated that 288 days would be worked during the year. During the month of February, 2015 only 20 days were worked. Find out Calendar Variance.

(d) From the following data you are required to compute:

- (i) Labour Rate Variance; (ii) Efficiency Variance; (iii) Idle Time Variance; and (iv) Total**

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Variance.

Standard time per unit	2.5 hours
Actual hours worked	2,000 hours
Standard rate of pay	₹2 per hour
25% of the actual hours have been lost as idle time	
Actual output	1,000 units
Actual wages	₹4,500

2+5+2+1 ½ ×4

Answer:

9. (a) CPI (Continuous Process Improvement) means making things better. It is a never ending effort to discover and eliminate the main causes of problems. Its goal is not to blame people for problems or failures ...it is simply a way of looking at how we can do our work better. When we take problem solving approach, we often never get to the root causes because our main goal is to put out the fire. But when we engage in process improvement, we seek to learn what causes things to happen and then use this knowledge to:

- ✓ Reduce the variation.
- ✓ Remove activities that have no value to the organization.
- ✓ Improve customer satisfaction.

(b) CPI performed in five phases under system approach model and these are noted below:

- (i) Analysis phase: This is the discovery phase where problems are uncovered and defined. This phase identify the areas of opportunity for target specific problems. These areas and problems are based on the team brain-storming sessions, process definition sessions, recommendation forwarded to the team by organizational members and other various analysis techniques.
- (ii) Design phase: Generate solutions to the brain-storming sessions. Identify the required resources to implement the chosen solution and identify baselines to measure. During this phase, two products will be developed - the process performance objectives and a measurement tool with baselines.
- (iii) Development phase: Formulate a detailed procedure for implementing the approved solution. This phase builds on the process performance objectives and measurement tool constructed in the design phase.
- (iv) Implementation phase: This is where you put your plan to action. This plan involves the changes for smoothing the implementation of the new process and executes the solution.
- (v) Evaluation phase: Build measurement tools, monitor implementation, and evaluate measurement to the baseline. Evaluations are used to measure the success and failure of a change. This section describes a few tools of measurement that allow an individual to solve the problems and make decisions.

(c) Standard working days per months = $288 \div 12 = 24$ days

$$\begin{aligned}\text{Calendar variance} &= (\text{Std. No. of working days} - \text{Actual no. of working days}) \times (\text{Total fixed OH in the budgeted period} \div \text{Std. No. of days in the budgeted period}) \\ &= (24 - 20) \times ₹14,400/288 \\ &= ₹200 \text{ (A)}\end{aligned}$$

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- (d) Std. Labour cost charged to production = 1,000 units × 2.5 hours × ₹2
= ₹5,000
- Actual wages rate per hour = ₹4,500 ÷ 2,000 hours
= ₹2.25
- Abnormal idle time = 25% of 2,000 hours
= 500 hours

Computation of variances:

- (i) Rate Variance = Actual time × (Std. Rate – Actual Rate)
= 2,000 hours × ₹(2 – 2.25)
= ₹500 (A)
- (ii) Efficiency Variance = Std. Rate × (Std. Time for actual output – Actual time less idle time)
= ₹2 × hrs. (2,500 – 1,500)
= ₹2,000 (F)
- (iii) Idle Time Variance = Idle time × Std. rate
= 500 hrs. × ₹2 = ₹1,000 (A)
- (iv) Total Variance = Std. Labour Cost – Actual Labour Cost
= ₹(5,000 – 4,500)
= ₹500 (F)

10. (a) What are the criteria to be maintained by the companies which want to get maximum benefit from 'target costing'?

(b) The activities involved in a PERT project are detailed in the following table:

Job(i- j)	DURATION TIME (DAYS)		
	most optimistic time	most likely time	most pessimistic time
1-2	3	6	15
2-3	6	12	30
3-5	5	11	17
7-8	4	19	28
5-8	1	4	7
6-7	3	9	27
4-5	3	6	15
1-6	2	5	14
2-4	2	5	8

- (i) Draw a network diagram.
- (ii) Find the critical path, expected time for completion of the project and project variance after estimating the earliest and latest event times for all nodes.
- (iii) Find the probability of completing the project before 31 days.
- (iv) What is the chance of project duration exceeding to 46 days?
- (v) What will be the effect on the current critical path if the most likely time of activity 3-5 gets revised to 14 instead of 11 days (given in the table)?

[Given that the probability of standard normal curve between:

(a) Z = 0 and Z = 2 is 0.4772, and

(b) Z = 0 and Z = -0.1 is 0.3413

4+[2+(1×3)+2+2+2]

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Answer:

10. (a) The following criteria are to be maintained by the companies who want to get maximum benefit from 'target costing':

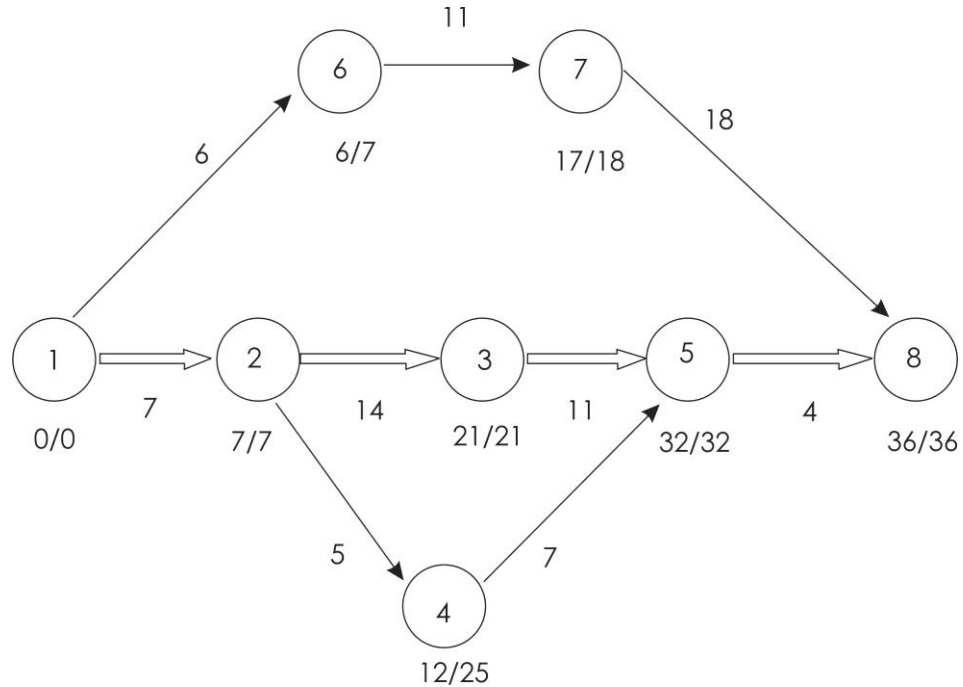
- (i) Assembly-oriented industries, as opposed to repetitive-process industries that produce homogeneous products.
- (ii) Industries involved heavily with the diversification of the product lines.
- (iii) Used technologies of factory automation, including computer-aided design, flexible manufacturing systems, office automation, computer-aided manufacturing etc.
- (iv) Have experienced shorter product life cycles where the pay-back for factor automation typically must be achieved in short-term period (less than eight years).
- (v) Must develop the system for reducing costs during the planning, design and development stages of a PLC.
- (vi) Able for implementing management methods, such as Just-in-time, Value engineering and Total Quality Control.

(b)

Job	Duration Time (Days)			Expected Time $t_e = \frac{t_o + 4t_m + t_p}{6}$	Variance $S_t^2 = \left(\frac{t_p - t_o}{6}\right)^2$
	Optimistic (t_o)	Most Likely (t_m)	Pessimistic (t_p)		
1-2	3	6	15	7	4
2-3	6	12	30	14	16
3-5	5	11	17	11	4
7-8	4	19	28	18	16
5-8	1	4	7	4	1
6-7	3	9	27	11	16
4-5	3	6	15	7	4
1-6	2	5	14	6	4
2-4	2	5	8	5	1

(i)

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(ii) The Critical Path is 1 -----2-----3-----5-----8

Expected time $E(T)$ for completion of the project is $7+14+11+4 = 36$ days.

Project Variance is obtained by summing variances of all the critical activities, i.e., $\delta_{\dagger}^2 = 4+16+4+1 = 25$

Therefore, $\delta_{\dagger} = \sqrt{25} = 5$

(iii) Probability of completing the project before 31 days is given by:

$$P(T \leq 31) = P[Z \leq (31 - 36)/5] = P(Z \leq -1) = 0.5 - P(-1 < Z \leq 0) = 0.5 - 0.3413 = 0.1587$$

(where $Z = [T - E(T)] / \delta_{\dagger}$)

(iv) Probability of project duration exceeding 46 days is given by:

$$P(T > 46) = P(Z > 2) = 1 - P(Z \leq 2) = 1 - [P(-\infty < Z \leq 0) + P(0 \leq Z \leq 2)] = 1 - (0.5 + 0.4772) = 1 - 0.9772 = 0.0228$$

(v) The weighted average time for activity (3-5) will become $(5+56+17) / 6 = 13$. Since this is on critical path, the project will get delayed by $(13 - 11) = 2$ days