PAPER – 15: BUSINESS STRATEGY AND STRATEGIC COST MANAGEMENT

The following table lists the learning objectives and the verbs that appear in the syllabus learning aims and examination questions:

	Learning objectives	Verbs used	Definition
LEVEL C	KNOWLEDGE What you are expected to know	List	Make a list of
		State	Express, fully or clearly, the details/facts
		Define	Give the exact meaning of
	COMPREHENSION What you are expected to understand	Describe	Communicate the key features of
		Distinguish	Highlight the differences between
		Explain	Make clear or intelligible/ state the meaning or purpose of
		Identity	Recognize, establish or select after consideration
		Illustrate	Use an example to describe or explain something
	APPLICATION How you are expected to apply your knowledge	Apply	Put to practical use
		Calculate	Ascertain or reckon mathematically
		Demonstrate	Prove with certainty or exhibit by practical means
		Prepare	Make or get ready for use
		Reconcile	Make or prove consistent/ compatible
		Solve	Find an answer to
		Tabulate	Arrange in a table
	ANALYSIS How you are expected to analyse the detail of what you have learned	Analyse	Examine in detail the structure of
		Categorise	Place into a defined class or division
		Compare and contrast	Show the similarities and/or differences between
		Construct	Build up or compile
		Prioritise	Place in order of priority or sequence for action
		Produce	Create or bring into existence
	SYNTHESIS How you are expected to utilize the information gathered to reach an optimum conclusion by a process of reasoning	Discuss	Examine in detail by argument
		Interpret	Translate into intelligible or familiar terms
		Decide	To solve or conclude
	EVALUATION How you are expected to use your learning to evaluate, make decisions or recommendations	Advise	Counsel, inform or notify
		Evaluate	Appraise or asses the value of
		Recommend	Propose a course of action

Paper 15 - Business Strategy and Strategic Cost Management

This paper contains 4 questions. All questions are compulsory, subject to instruction provided against each questions. All workings must form part of your answer. Assumptions, if any, must be clearly indicated.

Section A

1. Hassan Ltd. is one of the India's leading detergent manufacturing company. The firm has more than twenty-five product types. These have been developed over a period of its ten year existence. Some products are very successful while others have not performed well. The challenge for the board has been the formulation of strategy & policy in the way the company manages the portfolio of products.

As a newly recruited qualified Cost Accountant, your advice is being sought to address the following questions which the Product manager has prepared as input into his paper to the Board.

(a) Describe the Boston Consulting Group (BCG) growth vector matrix.

(b) Explain the strategic options which are available to Hassan in accordance to the BCG Matrix.

(c) State the limitations the model poses to the Product Manager as he prepares his paper to the Board.

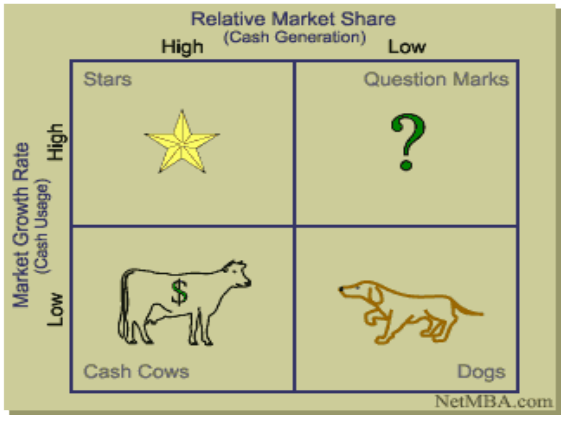
(d) There are some products, which have high market growth rate but have low market share, produced by the Hassan Ltd. In the time of inevitably slow industry growth rate their market can be reduced. In this circumstances, state those strategies which are to be followed by Hassan Ltd. (10+2+3+5=20)

Answer:

(a) The BCG Matrix is a model used to analyze the portfolio of strategic business units, investments and products according to their cash generating capabilities whose function is relative market share and market growth rate. This result into 4 categories being: question marks (future potential earners), stars (increasing good positive cash flow), cash cows (cash rich) and dogs (declining cash flows).

The BCG Growth-Share Matrix is a portfolio planning model developed by Bruce Henderson of the Boston Consulting Group in the early 1970's. It is based on the observation that a company's business units can be classified into four categories based on combinations of market growth and market share relative to the largest competitor, hence the name "growth-share". Market growth serves as a proxy for industry attractiveness, and relative market share serves as a proxy for competitive advantage. The growth-share matrix thus maps the business unit positions within these two important determinants of profitability.

BCG Growth-Share Matrix



This framework assumes that an increase in relative market share will result in an increase in the generation of cash. This assumption often is true because of the experience curve; increased relative market share implies that the firm is moving forward on the experience curve relative to its competitors, thus developing a cost advantage. A second assumption is that a growing market requires investment in assets to increase capacity and therefore results in the consumption of cash. Thus the position of a business on the growth-share matrix provides an indication of its cash generation and its cash consumption.

Henderson reasoned that the cash required by rapidly growing business units could be obtained from the firm's other business units that were at a more mature stage and generating significant cash. By investing to become the market share leader in a rapidly growing market, the business unit could move along the experience curve and develop a cost advantage. From this reasoning, the BCG Growth-Share Matrix was born.

The four categories are:

- Dogs - Dogs have low market share and a low growth rate and thus neither generate nor consume a large amount of cash. However, dogs are cash traps because of the money tied up in a business that has little potential. Such businesses are candidates for divestiture.
- Question marks - Question marks are growing rapidly and thus consume large amounts of cash, but because they have low market shares they do not generate much cash. The result is large net cash consumption. A question mark (also known as a "problem child") has the potential to gain market share and become a star, and eventually a cash cow when the market growth slows. If the question mark does not succeed in becoming the market leader, then after perhaps years of cash consumption it will degenerate into a dog when the market growth declines. Question marks must be analyzed carefully in order to determine whether they are worth the investment required to grow market share.
- Stars - Stars generate large amounts of cash because of their strong relative market share, but also consume large amounts of cash because of their high growth rate; therefore the cash in each direction approximately nets out. If a star can maintain its large market share, it will become a cash cow when the market growth rate declines. The portfolio of a diversified company always should have stars that will become the next cash cows and ensure future cash generation.
- Cash cows - As leaders in a mature market, cash cows exhibit a return on assets that is greater than the market growth rate, and thus generate more cash than they consume. Such business units should be "milked", extracting the profits and investing as little cash as possible. Cash cows provide the cash required to turn question marks into market leaders, to cover the administrative costs of the company, to fund research and development, to service the corporate debt, and to pay dividends to shareholders. Because the cash cow generates a relatively stable cash flow, its value can be determined with reasonable accuracy by calculating the present value of its cash stream using a discounted cash flow analysis.

Under the growth-share matrix model, as an industry matures and its growth rate declines, a business unit will become either a cash cow or a dog, determined soley by whether it had become the market leader during the period of high growth.

While originally developed as a model for resource allocation among the various business units in a corporation, the growth-share matrix also can be used for resource allocation among products within a single business unit. Its simplicity is its strength - the relative positions of the firm's entire business portfolio can be displayed in a single diagram.

(b) Hassan has four strategic choices when we look at the BCG Matrix. They include:

Build - this is where Hassan uses funds from other products to invest in question marks or stars. These funds are usually harvested from cash cows. This is about moving excess cash around various product lines especially those with potential for growth but lacking own funds for reinvestments.

Hold - this is where funds are ploughed back or profits reinvested. This is applicable to question marks and stars.

Harvest - this is where funds are milked out of cash cows and used to build question marks and stars.

Divest - this is applicable in cases where Hassan discontinues operations of product lines that are no longer profitable.

(c) The limitations include:

(i) Market information regarding aggregate demand and market shares held by competing firms may not be readily available or too expensive to obtain.
(ii) Too simplistic by assuming that cash flow is affected by only market growth rate and relative market share.
(iii) Assumes that only longer staying firms in the market can build competitive edge. In modern business environments, this is not possible. We have seen new entrants easily overtaking long established firms.

(d) The following strategies can be followed by Hassan Ltd. to hold the market growth rate high:
(i) Invest more money to see whether the market share can be increased.
(ii) Harvest whatever can be extracted and then close down.
(iii) Divest by selling or hiving off the business unit.
(iv) Minimize the number of dogs in a company.
(v) Expensive turnaround plans should be avoided.

2. Answer any two questions [2×15 =30 marks]

(a) (i) "Choice of strategy is influenced by some factors"- State the factors that influence the choice of strategy.
(ii) Discuss about the Organizational Development and its characteristics.
(iii) Distinction between Strategic Management and Strategic Planning [5+5+5]

Answer:

(i) Choice of strategy is a decision making process of a choice from among alternative strategies. It is the process of comparing the impact of the possible strategies on the firm and it implies tradeoff between courses of action. These decisions involve focusing on a few alternatives, considering the selection factors, evaluating the alternatives and making the actual choice.

Choice of strategy is influenced by following factors:-

- **External Constraints:-** Choice of strategy is governed by the extent and degree of the firm's dependence on owners, customers, suppliers, and the govt.
- **Intra-Organizational Forces:-** Decisions are influenced by the power play among different interest groups and by the degree of uncertainty.
- **Values and preferences and managerial attitudes towards risk: -** Evaluation of strategy is determined by personal values (truth, knowledge etc.) and attitude

towards risk. Risk lover prefers high risky projects with high return. Risk averser prefers safer options.

- **Impact of past strategy:-** The choice of strategy may be influenced by the earlier strategy because it is starting point in the formulation of new strategy and decision maker is involved in past strategy.
- **Time constraint:-** Choice of strategy is influenced by the time dimension i.e., whether it will be short term or long term, whether it has immediate action or not.

(ii) Organizational Development:- Organizational development (OD) is a complex educational strategy designed to increase organizational effectiveness and wealth through planned involvement by a consultant using theory and techniques of applied behavioural science.

Characteristics of OD

- It is educational strategy, which attempts to bring about a planned change.
- It is concerned with improving organizational climate and culture.
- It related to real organizational problems instead of hypothetical classroom cases.
- It uses sensitivity training methods and emphasizes the importance of experimentally based training.
- Its change agents are almost external consultants outside of the organization.
- External change agents and internal organization executives establish a collaborative relationship involving mutual trust and influence, and jointly determined goals.
- It provides feedback data and information to the participants.
- It is a long-term approach concerned with people for increasing organizational effectiveness.
- It is research based as most of its interventions are based on research findings.

(iii) The basic difference between Strategic management and Strategic planning are as follows:

Strategic Management	Strategic Planning
It is focused on producing strategic results; new markets, new products, new technologies.	It is focused on making optimal strategic decisions.
It is management by results.	It is management by plans.
It is an organizational action process.	It is an analytical process.
It is broadens focus to include psychological, sociological and political variables.	It is focused on business, economic and technological variables.
It is about choosing things to do and also about the people who will do them.	It is about choosing things to do.

(b) (i) Enumerate the advantages of Strategic Planning.
(ii) Discuss the benefits of Strategic Alliance.
(iii) Describe about the Internal and Competitive Benchmarking [5+5+5]

Answer:

(i) Strategic Planning

Strategic planning refers to the formulation of a unified, comprehensive and integrated plan to get the strategic advantages by challenging the environment. It is concerned with appraising the environment in relation to the firm, identifying the strategies for the future with the best possible knowledge of their probable outcome and effect to obtain sanction for one of the alternatives, which is to be ultimately interpreted and

communicated in operational terms. Thus strategic planning provides the framework within which future activities of firm are expected to be carried out.

Strategic planning has following advantages or usefulness:-

- According to different research studies, strategic planning contributes positively to the performance of enterprise and predicts better outcomes and isolates key factors of the firm.
- It is concerned with the allocation of resources to product market opportunities and concerned to realize the company's profit potential through selected strategies.
- It measures the strengths and weaknesses of the firm.
- It selects the optimum strategy from the alternatives considering the interest of the firm, personal values of top management and social responsibility of the firm.
- With fast changing product market condition, technology economic condition the strategic planning is the only means by which future opportunities and problems can be anticipated by company executives.
- It enables executives to provide necessary direction for the firm, to take full advantage of new opportunities and to minimize the risk.

(ii) Benefits of Strategic Alliance

Nowadays, strategic alliance has become a common strategy to businesses. Two or more enterprises choose to form a partnership and work cooperatively to achieve their mutually beneficial objectives.

In a plain view, strategic alliance just reflects the desire of enterprises to achieve their independent business objectives cooperatively. But, in the true fact of today's globalizes and complex market place, there is the need to make such a business arrangement in order to gain competitive advantages among the fierce competitors in the market place.

Enterprises that enter into strategic alliance usually expect to benefit in one or more ways. Some of the potential benefits that enterprises could achieve are such as:

- **Gaining capabilities**

An enterprise may want to produce something or to enquire certain resources that it lacks in the knowledge, technology and expertise. It may need to share those capabilities that the other firms have. Thus, strategic alliance is the opportunity for the enterprise to achieve its objectives in this aspect. Further to that, in later time the enterprise also could then use the newly acquired capabilities by itself and for its own purposes.

- **Easier access to target markets**

Introducing the product into a new market can be complicated and costly. It may expose the enterprise to several obstacles such as entrench competition, hostile government regulations and additional operating complexity. There are also the risks of opportunity costs and direct financial losses due to improper assessment of the market situations.

Choosing a strategic alliance as the entry mode will overcome some of those problems and help reduce the entry cost. For example, an enterprise can license a product to its alliance to widen the market of that particular product.

- **Sharing the financial risk**

Enterprises can make use of the strategic arrangement to reduce their individual enterprise's financial risk. For example, when two firms jointly invested with equal share on a project, the greatest potential that each of them stand to lose is only half of the total project cost in case the venture failed.

- **Winning the political obstacle**

Bringing a product into another country might confront the enterprise with political factors and strict regulations imposed by the national government. Some countries are politically restrictive while some are highly concerned about the influence of foreign firms on their economics that they require foreign enterprises to engage in the joint venture with local firms. In this circumstance, strategic alliance will enable enterprises to penetrate the local markets of the targeted country.

- **Achieving synergy and competitive advantage**

Synergy and competitive advantage are elements that lead businesses to greater success. An enterprise may not be strong enough to attain these elements by itself, but it might possible by joint efforts with another enterprise. The combination of individual strengths will enable it to compete more effectively and achieve better than if it attempts on its own.

(iii) Internal Benchmarking

It involves looking within the organization to determine other departments, locations and projects which have similar activities and then defining the best practices amongst them. It involves seeking partners from within the same organization. For example, from business units located in different areas. The main advantages of internal benchmarking are that access to sensitive data and information are easier; standardized data is often readily available; and usually less time and resources are needed. There may be fewer barriers to implementation as practices maybe relatively easy to transfer across the same organization. However real innovation may be lacking and best in class performance is more likely to be found through external benchmarking.

Competitive Benchmarking

It involves examining the products, services and processes of competitors and then comparing them with their own. It involves the comparison of competitors' products, process and business results with own. It requires that the company perform a detailed analysis of its competitors' products, services, and processes. Benchmarking partners are drawn from the same sector. However to protect confidentiality it is common for the companies to undertake this type of benchmarking through trade associations or third parties.

(c) (i) State the industry characteristics which influence the intensity of rivalry among the firms.

(ii) State the drawbacks of Vertical Integration. [10+5]

Answer:

(i) The intensity of rivalry is influenced by the following industry characteristics:

- A larger number of firms increase rivalry because more firms must compete for the same customers and resources. The rivalry intensifies if the firms have similar market share, leading to a struggle for market leadership.
- Slow market growth causes firms to fight for market share. In a growing market, firms are able to improve revenues simply because of the expanding market.
- High fixed costs result in an economy of scale effect that increases rivalry. When total costs are mostly fixed costs, the firm must produce near capacity to attain the lowest unit costs.
- High storage costs or highly perishable products cause a producer to sell goods as soon as possible. If other producers are attempting to unload at the same time, competition for customers intensifies.
- Low switching costs increases rivalry. When a customer can freely switch from one product to another there is a greater struggle to capture customers.
- Low level of product differentiation is associated with higher levels of rivalry. Brand identification, on the other hand, tends to constrain rivalry.
- Strategic stakes are high when a firm is losing market position or has potential for great gains. This intensifies rivalry.
- High exit barriers place a high cost on abandoning the product. The firm must compete. High exit barriers cause a firm to remain in an industry, even when the venture is not profitable.
- A diversity of rivals with different cultures, histories, and philosophies make an industry unstable. There is greater possibility for mavericks and for misjudging rival's moves. Rivalry is volatile and can be intense.

- Industry Shakeout: A growing market and the potential for high profits induce new firms to enter a market and incumbent firms to increase production. A point is reached where the industry becomes crowded with competitors, and demand cannot support the new entrants and the resulting increased supply. The industry may become crowded if its growth rate slows and the market becomes saturated, creating a situation of excess capacity with too many goods chasing too few buyers. A shakeout ensues, with intense competition, price wars, and company failures.

(ii) Vertical Integration:

Vertical integration represents an expansion or extension of the firm by integrating preceding or successive 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 example, an automobile manufacturer might supply its own parts or make its own engines to secure sources of supply.

Drawbacks of Vertical Integration

While some of the benefits of vertical integration can be quite attractive to the firm, the drawbacks may negate any potential gains. Vertical integration potentially has the following disadvantages:

- Capacity balancing issues. For example, the firm may need to build excess upstream capacity to ensure that its downstream operations have sufficient supply under all demand conditions.
- Potentially higher costs due to low efficiencies resulting from lack of supplier competition.
- Decreased flexibility due to previous upstream or downstream investments. (Note however, that flexibility to coordinate vertically-related activities may increase.)
- Decreased ability to increase product variety if significant in-house development is required.
- Developing new core competencies may compromise existing competencies.
- Increased bureaucratic costs.

Question.3 (Compulsory) **[20 marks]**

Gujarat Mineral Development Corporation (GMDC) has two divisions. The Mining Division makes toldine, which is then transferred to the Metals Division. The toldine is further processed by the Metals Division and is sold to customers at a price of Rs 1,500 per unit. The Mining Division is currently required by GMDC to transfer its total yearly output of 4,00,000 units of toldine to the Metals Division at 110% of full manufacturing cost. Unlimited quantities of toldine can be purchased and sold on the outside market at ₹ 900 per unit.

The following table gives the manufacturing costs per unit in the Mining and Metals divisions for 2014-15:

	Mining Division	Metals Division
Direct materials	₹ 120	₹ 60
Direct manufacturing labour costs	₹ 160	₹ 200
Manufacturing overhead costs	₹ 320[a]	₹ 250[b]
Total manufacturing costs per unit	₹ 600	₹ 510

[a]Manufacturing overhead costs in the Mining Division are 25% fixed and 75% variable.
[b]Manufacturing overhead costs in the Metals Division are 60% fixed and 40% variable.

1. **Calculate the operating incomes for the Mining and Metals divisions for the 4,00,000 units of toldine transferred under the following transfer-pricing methods: (A) market price and (B) 110% of full manufacturing costs.**

2. Suppose GMDC rewards each division manager with a bonus, calculated as 1% of division operating income (if positive). What is the amount of bonus that will be paid to each division manager under the transfer-pricing methods in requirement 1? Which transfer-pricing method will each division manager prefer to use?

3. State the arguments would Amit, manager of the Mining Division, makes to support the transfer-pricing method that he prefers? [(6+6)+5+3]

Answer:

1. Effect of alternative transfer-pricing methods on division operating income.

	Internal Transfers at Market Prices Method A	Internal Transfers at 110% of full Costs Method B
Mining Division		
Revenues		
₹ 900, ₹ 660[1] × 4,00,000 units	₹ 36,00,00,000	₹ 26,40,00,000
Deduct:		
Division variable costs:		
₹ 520[2] × 4,00,000 units	₹ 20,80,00,000	₹ 20,80,00,000
Division fixed costs:		
₹ 80[3] × 4,00,000 units	₹ 3,20,00,000	₹ 3,20,00,000
Division operating income	₹ 12,00,00,000	₹ 2,40,00,000
Metals Division		
Revenues		
₹ 1,500 × 4,00,000 units	₹ 60,00,00,000	₹ 60,00,00,000
Deduct:		
Transferred-in-costs		
₹ 900, ₹ 660 × 4,00,000 units	₹ 36,00,00,000	₹ 26,40,00,000
Division variable costs		
₹ 360[4] × 4,00,000 units	₹ 14,40,00,000	₹ 14,40,00,000
Division fixed costs		
₹ 150[4] × 4,00,000 units	₹ 6,00,00,000	₹ 6,00,00,000
Division operating income	₹ 3,60,00,000	₹ 13,20,00,000

[1]₹ 660 = ₹ 600 × 110%

[2]Variable cost per unit in Mining Division = Direct materials + Direct manufacturing labor + 75% of Manufacturing overhead = ₹ 120 + ₹ 160 + 75% × ₹ 320 = ₹ 520

[3]Fixed cost per unit = 25% of Manufacturing overhead = 25% × ₹ 320 = ₹ 80

[4]Variable cost per unit in Metals Division = Direct materials + Direct manufacturing labor + 40% of Manufacturing overhead = ₹ 60 + ₹ 200 + 40% × ₹ 250 = ₹ 360

[5]Fixed cost per unit in Metals Division = 60% of Manufacturing overhead = 60% × ₹ 250 = ₹ 150.

2. Bonus paid to division managers at 1% of division operating income will be as follows:

	Method A Internal Transfers at Market Prices	Method B Internal Transfers at 110% of Full Costs
Mining Division manager's bonus (1% × ₹ 12,00,00,000; 1% × ₹ 2,40,00,000)	₹ 12,00,000	₹ 2,40,000

Metals Division manager's bonus (1% × ₹ 3,60,00,000; 1% × ₹ 13,20,00,000)	₹ 3,60,000	₹ 13,20,000

The Mining Division manager will prefer Method A (transfer at market prices) because this method gives ₹ 12,00,000 of bonus rather than ₹ 2,40,000 under Method B (transfers at 110% of full costs). The Metals Division manager will prefer Method B because this method gives ₹ 13,20,000 of bonus rather than ₹ 3,60,000 under Method A.

3. Amit, the manager of the Mining Division, will appeal to the existence of a competitive market to price transfers at market prices. Using market prices for transfers in these conditions leads to goal congruence. Division managers acting in their own best interests make decisions that are also in the best interests of the company as a whole. Further, setting transfer prices based on cost will cause the Mining Division to pay no attention to controlling costs since all costs incurred will be recovered from the Metals Division at 110% of full costs.

Question.4 Answer any two questions [2×15 =30 marks]

(a) (i) A company produces two products X and Y, the production cost of which are show below:

	X (₹)	Y (₹)
Direct material cost	**47.50**	**47.50**
Direct labour cost	**23.75**	**42.75**
Variable overhead	**23.75**	**42.75**
Fixed overhead	**23.75**	**42.75**
	118.75	**175.75**

Fixed overhead is absorbed on the basis of direct labour cost.

The product passes through two processes, Assembly and Painting. The associated labour cost is ₹ 47.50 per direct labour hour in each. The direct labour associated with the two products for these processes are shown below:

Process	Time taken	
	Product X	Product Y
Assembly	**10 minutes**	**40 minute**
Painting	**20 minutes**	**15 minutes**

The current market price for X is ₹ 308.75 and for Y it is ₹ 247. At these prices, the market will absorb as many units of X and Y as the company can produce. The capacity of the company to produce X and Y is limited by the available capacity of the two processes. The company operates two shifts of 8 hours each. Painting is a single process line and two hours in each shift will be down time. Assembly can process two units simultaneously, although this will double the requirement of direct labour. Painting can operate for full 16 working hours each day.

What production plan should the company follow in order to maximize profit under (I) Traditional Costing System and (II) Throughput Accounting System? [3+3]

Answer:

The total maximum processing time per day in 2 shifts:

Assembly	(2x8 hours)x 60 minutes	=960 minutes
Painting	(2x6 hours)x 60 minutes	=720 minutes
Expected output (units) per day	X	Y
Assembly	(960/10)x2*=192	(960/40)x2*=48 [*2 units at a time]
Painting	(720/20)=36	(720/15)=48

The key factor or the constraint is the time for painting.

I. Under Traditional approach

Contribution of X per minute in painting	=₹(308.75-95)÷20	=₹ 10.69
Contribution of Y per minute in painting	₹(247-133)÷15	=₹ 7.60

So, produce maximum possible number of X for (36 units x ₹213.75) = ₹ 7,695 (contribution)

II. Under throughput approach-

Contribution of X per minute in painting	=₹(308.75-47.50)÷20	=₹ 13.06
Contribution of Y per minute in painting	=₹ (247-47.50)÷15	=₹ 13.30

So, produce maximum possible number of Y for (48 units x ₹ 114) = ₹ 5,472 (contribution)

4(a) (ii)

A company has developed a special purpose Electronic Security Device and once introduced in the market, the same expected to have a life cycle of 3 years from the time of its introduction in the market before the device becomes obsolete due to technological advancement of other competitive products.

You have been asked by the company to prepare a product life cycle budget.

The following information is available:

	Year I	**Year II**	**Year III**
No. of units to be manufactured and sold	**50,000**	**2,00,000**	**1,50,000**
Price per device (₹)	**500**	**400**	**350**
R & D and Design cost (₹)	**9,00,000**	**1,00,000**	**Nil**
Production cost:			
Variable cost per device(₹)	**200**	**150**	**150**
Fixed cost(₹)	**70,00,000**	**70,00,000**	**70,00,000**
Marketing cost:			
Variable cost per device(₹)	**100**	**70**	**60**
Fixed cost(₹)	**30,00,000**	**25,00,000**	**25,00,000**
Distribution cost:			
Variable cost per device(₹)	**50**	**50**	**50**
Fixed cost(₹)	**10,00,000**	**10,00,000**	**10,00,000**

Prepare the budgeted life cycle operating profit.

It has been further indicated that if a discount of 10% is given to customer, the unit to be sold per year will increased by 5%. Would you recommend introduction of such discount? [3+6]

Answer:

Preparation Of Budgeted Life Cycle Operating Profit

(₹ In Lakh)

	Year I	**Year II**	**Year III**	**Life Cycle**
Sales Revenue	250.00	800.00	525.00	1,575.00
R & D, Design cost	9.00	1.00		10.00
Production cost:				
Variable cost	100.00	300.00	225.00	625.00
Fixed cost	70.00	70.00	70.00	210.00
Marketing Cost:				
Variable cost	50.00	140.00	90.00	280.00
Fixed cost	30.00	25.00	25.00	80.00
Distribution cost:				
Variable cost	25.00	100.00	75.00	200.00
Fixed cost	10.00	10.00	10.00	30.00
	294.00	646.00	495.00	1,435.00
Operating profit	(44.00)	154.00	30.00	140.00

Operating results if discount given:

WN: Revised sales revenue	Total Units X SP (₹)	=Total (₹ Lakh)
Year I	50,000+ 5%=52,500 X 450	=236.25

Year II	2,00,000+5%=2,10,000X 360	=756.00
Year III	1,50,000+5%= 1,57,500X 315	=496.12
		1,488.37

Budgeted Life Cycle Profit (With discount of 10% to customers and sales increase by 5%)

(In ₹ Lakh)

	Year I	Year II	Year III	Total Life Cycle
Sales Revenue	236.25	756.00	496.12	1,488.37
R & D, Design	9.00	1.00		10.00
Production cost:				
Variable	105.00	315.00	236.25	656.25
Fixed	70.00	70.00	70.00	210.00
Marketing Cost:				
Variable	52.50	147.00	94.50	294.00
Fixed	30.00	25.00	25.00	80.00
Distribution Cost:				
Variable	26.25	105.00	78.75	210.00
Fixed	10.00	10.00	10.00	30.00
	302.75	673.00	514.50	1,490.25
Operating profit	(66.50)	83.00	(18.38)	(1.88)

The second alternative is not acceptable, as that would result in overall loss during the life cycle.

4(b).(i)

Explain the theory of constraints? [5]

Answer:

The theory of constraints (TOC) focuses attention on constraints and bottlenecks within the organization which stands in the way for speedy production. The theory was developed by Goldartt and Cox to help managers to improve overall profitability of the concern. The main concept is to maximize the rate of manufacturing outputs. The theory was turned into an accounting system known as Throughput Accounting.

TOC views that the peace of production is guided by the bottleneck within the organization; hence the same should be either removed or their influence to hinder production be minimized.

In the new approach to production management called OPT (optimized production technology), TOC advocates a throughput orientation whereby throughput must be given first priority, inventories second and operational expenses last. The TOC adopts a short-run time horizon and treats all operating expenses (including direct labour but excluding direct materials) as fixed, thus implying that variable costing should be used for decision-making, profit measurement and inventory valuation. In substance, TOC appears to be merely a restatement of contribution per limiting factor; and in reality, TOC deals with a LP problem of maximizing throughput contribution subject to constraint of bottleneck resources.

4(b).(ii)

Apollo Company prepares its budgeted output and sales at its maximum capacity of 50,000 units for 2014. However, due to efficiency improvements, Apollo was able to sell 55,000 units for the year. Other data for 2014 follows as:

Budgeted fixed overhead costs	**₹ 41,25,000**
Budgeted selling price	**₹ 825**
Budgeted variable cost per unit	**₹ 330**

I. Calculate the budgeted profit per unit, the operating income based on the budgeted profit per unit, and the flexible-budget operating income.

II. Compute sales-volume variance and production-volume variance. What do each of these variance measures? [4+6]

Answer:

I.

Budgeted selling price		₹ 825
Budgeted variable cost per unit	₹ 330	
Budgeted fixed cost per unit (₹ 41,25,000 ÷ 50,000)	₹ 82.50	
Budgeted cost per unit		₹ 412.50
Budgeted profit per unit		₹ 412.50
Operating income based on budgeted profit per unit ₹ 412.50 per unit X 55,000 units		₹ 2,26,87,500
Flexible-budget operating income is revenue ₹ 825X 55,000		₹ 4,53,75,000
Variable cost ₹ 330X 55,000		₹ 1,81,50,000
Fixed costs		₹ 41,25,000
Operating income		₹ 2,31,00,000
Static-budget operating income is:		
Revenue ₹ 825 X 50,000		₹ 4,12,50,000
Variable costs ₹ 330 X 50,000		₹ 1,65,00,000
Fixed costs		₹ 41,25,000
Operating income		₹ 1,23,75,000

II. The sales volume variance recognizes that when Apollo sells 55,000 units instead of the budgeted 50,000, only the revenue and the variable costs are affected. Fixed cost remains unchanged.

Sales volume variance	[Budgeted selling price-Budgeted variable costs per unit X Difference in quantity of units sold relative to the static budget		
	= (₹ 825 - ₹ 330)X 5,000	= ₹ 495 X 5,000	= ₹ 24,75,000F
Production-volume variance	Budgeted fixed overhead cost per unit X Difference in quantity of units sold relative to the static budget		
	= ₹ 41,25,000/50,000 × 5,000	= ₹ 82.5 × 5,000	= ₹ 4,12,500F

Now, compare the sales-volume variance and the production-volume variance. The ₹ 24,75,000F sales-volume variance explains the difference between the static-budget operating income and the flexible-budget operating income:

Static-budget operating income	₹ 1,23,75,000
Sales-volume variance	₹ 24,75,000F
Flexible-budget operating income	₹ 1,48,50,000

The ₹ 4,12,500F production-volume variance explains the difference between operating income based on the budgeted profit per unit and the flexible-budget operating income:

Operating income based on budgeted profit per unit	₹ 2,26,87,500
Production-volume variance	₹ 4,12,500
Flexible-budget operating income	₹ 2,31,00,000

Question.4 (c) (i)

An automobile production line turns out about 100 cars a day, but deviations occur owing to many causes. The production is more accurately described by the probability distribution given below:

Production per day	Probability	Production per day	Probability
95	**0.03**	**101**	**0.15**
96	**0.05**	**102**	**0.10**
97	**0.07**	**103**	**0.07**
98	**0.10**	**104**	**0.05**
99	**0.15**	**105**	**0.03**
100	**0.20**	**Total**	**1.00**

Finished cars are transported across the day, at the end of the each day; by ferry has space for only 101 cars.
Required:

I. What will be the average number of cars waiting to be shipped?

II. What will be the average area of empty space on the boat?

The fifteen random numbers are given: 20, 63, 46, 16, 45, 41, 44, 66, 87, 26, 78, 40, 29, 92, & 21

[3+3]

Answer:

Simulation of data of the Automobile Production Line

Production/day	Probability	Cumulative Probability	Random No. Range
95	0.03	0.03	0-2
96	0.05	0.08	3-7
97	0.07	0.15	8-14
98	0.10	0.25	15-24
99	0.15	0.40	25-39
100	0.20	0.60	40-59
101	0.15	0.75	60-74
102	0.10	0.85	75-84
103	0.07	0.92	85-91
104	0.05	.97	92-96
105	0.03	1.00	97-99
Total	**1.00**		

Day	Random No.	Production	No. of cars waited to be shipped	No. of empty space on the boat
1	20	98	-	3
2	63	101	-	-
3	46	100	-	1
4	16	98	-	3
5	45	100	-	1
6	41	100	-	1
7	44	100	-	1
8	66	101	-	-
9	87	103	2	-
10	26	99	-	2
11	78	102	1	-
12	40	100	-	1
13	29	99	-	2
14	92	104	3	-
15	21	98	-	3

Total			**6**	**18**

I. Average No. of cars waiting to be shipped: 6 ÷ 15 = 0.40

II. Average No. of empty space on the boat: 18 ÷ 15 =1.2

4 (c).(ii)

Two similar products A and B, manufactured by a company for a production period have the following data:

Particulars	Product A	Product B
Selling price (₹/unit)	142.50	199.50
Variable cost (₹/unit)	85.50	114.00
Labour hours per unit	2	6

Total fixed costs that have to be incurred irrespective of the type of product amounts to ₹ 5,13,000. Besides, there are specific fixed costs of ₹ 1,71,000 to be incurred only if A is produced and ₹ 2,05,200 to be incurred only if B is produced. Assume no inventory. At present, 7,500 units of A and 7,500 units of B are sold.

Required:

I. What is the current Break-Even Point (BEP)?

II. What is the minimum number of units to achieve BEP?

III. If there are only 10,000 labour hours possible in production period, what would be the optimum product-mix? [2×3=6]

Answer:

I. Current BEP (both A and B produced):

Total Fixed Cost = ₹ (1,71,000 + 2,05,200 + 5,13,000) = ₹ 8,89,200

Contribution of A = ₹ 57, B = ₹ 85.50, Average = ₹ 71.25 (equal no. of units A and B)

BEP = ₹ 8,89,200/₹ 71.25 = 12,480 units (i.e., 6,240 units of A and 6,240 units of B)

II. If only A is produced, BEP (₹ 1,71,000 + ₹ 5,13,000)/₹ 57 = 12,000 units

If only B is produced BEP (₹ 2,05,200 + ₹ 5,13,000)/₹ 85.50 = 8,400 units

Minimum number of units for BEP = 8,400 units of B

III. Contribution per labour hour A: ₹ 57/2 = ₹ 28.50 and for B = ₹ 85.50/6 = ₹ 14.25

With given 10,000 labour hours calculation of optimum product mix is not possible as with 10,000 labour hours one can produce only 10,000/₹ 28.50 = 351 units of A & 10,000/₹ 14.25 = 702 units of B which are much lower than their respective BEPs.

(A produced 351 units and B produced 702 units which are below the BEP)

4 (c).(iii) "Kaizen Costing is an approach that explicitly incorporates continuous improvement during the budget period" Discuss the statement. [3]

Answer:

'Kaizen' is a Japanese term for making improvement to a process through small incremental amounts, rather than through large innovation. Kaizen Costing focuses on the production process and the cost reductions are derived primarily through the efficiency of the production process. As the products are already in the manufacturing stage of their life cycles, the potential cost reductions are smaller- the aim of Kaizen

costing being to reduce the cost of components and products by a pre-specified amount.

For example, each plant in a manufacturing unit may be assigned a target cost reduction ratio and this is applied to the previous year's actual costs to determine the target cost reduction. Kaizen Costing relies heavily on employee empowerment. They are assumed to have superior knowledge about how to improve processes because they are closets to the manufacturing processes and customers, and are likely to have greater insights into how costs can be reduced.