Paper – 17 - Strategic Performance Management

This paper contains 10 questions, divide in three sections; Section A, Section B and Section C. In total 7 questions are to be answered.

From Section A, Question No. 1 is compulsory and answer any two questions from Section A (out of three questions – questions Nos. 2 to 4). From Section B, Answer any two questions (i.e. out of Question nos. 5 to 7). From Section C, Answer any two questions (i.e. out of question nos.8 to 10).

Students are requested to read the instructions against each individual question also. All workings must form part of your answer. Assumptions, if any, must be clearly indicated.

Section –A

[Question 1 is compulsory and answers any 2 from the rest]

1. **Read the following case let and answer the following questions:**
   Sahni Auto Industries is a manufacturer and exporter of Auto parts with an annual turnover of Rupees one thousand crores. It employs about 2,000 persons in its factory in Punjab and its other offices in India and abroad. The personnel Administration and Human resources Department of the company is headed by Mr. Amit Kapoor-the Chief Personnel Manager. Mr. Amit Kapoor, an Automobile Engineer joined the company 5 years ago as Product Development Manager. After a successful stint of 4 years as Product Development Manager, he was transferred to Personnel Administration and Human Resources Department as the Chief Personnel Manager as a part of Career development plan. Mr. Vikas, MBA in Human Resources from a renowned Business school, joined the company as Personnel Manager only 3 months back. He reports to Mr. Amit Kapoor-the Chief Personnel Manager. He handles all routine personnel and industrial relations matters.
   One day, during informal discussion with Mr. Amit Kapoor, Mr. Vikas suggested him of linking Human Resources Management with Company's strategic goals and objectives to further improve business performance and also to develop Organizational culture that fosters more innovative ideas. He also advocated creating abundant 'Social Capital' on the ground that people tend to be more productive in an environment which has trust and goodwill embedded in it rather than which is highly hierarchical and formal. Mr. Amit Kapoor disagreed with Mr. Vikas and told him that the role of Human Resources Department was only peripheral to the business and all his suggestions about its strategic role were beyond the purview of Personnel Administration and Human Resources Department. After this, Mr. Vikas started having number of arguments with Mr. Amit Kapoor in several issues relating to personnel and industrial relations since he felt that a person with a degree in Human Resources Management was in a far better position to run Personnel Administration and Human Resources Department. Mr. Amit Kapoor - the Chief Personnel Manager had often shown his displeasure on Mr. Vikas's argumentative, tendency and had made it known to the General Manager. The General Manager called Mr. Amit Kapoor in his office to inform him that he has been elected for an overseas assignment. He further told him to find a suitable person as his successor; he even suggested Mr. Vikas as a possible candidate. Mr. Amit Kapoor, however, selected Mr. Balram, who was working as Training Manager in a Multinational Company for the last 5 years. Mr. Vikas, soon started having arguments with Mr. Balram also over number of issues relating to industrial relations since he felt that he had no experience in handling industrial relations matters. Mr. Balram now realized that Mr. Vikas was trying to make things difficult for him. After a series of meetings with the General Manager, Mr. Balram

eventually succeeded in convincing him to transfer Mr. Vikas to an office outside Punjab. On learning about his impending transfer, Mr. Vikas wrote a letter to the General Manager joining details of various instances, when Mr. Balram had shown his incompetence in handling problematic situations. When asked for explanation by the General Manager, Mr. Balram had refuted almost all the allegations. The General Manager accepted his explanation and informed Mr. Vikas that most of his allegations against Mr. Balram were unwarranted and baseless. He further advised him to avoid confrontation with Mr. Balram. Mr. Vikas then wrote a letter to the Chairman repeating all the allegations against Mr. Balram. On investigation, the Chairman found most of the allegations were true. He then called all the three-the General Manager, the Chief Personnel Manager and the Personnel Manager in his office and implored them to forget the past and henceforth to work in coordination with each other in an environment of Trust and Goodwill.

Required:

(a)Indentify and discuss the major issues raised in the case.

(b)Comment on the recruitment of the two Chief Personnel Managers.

(c)Would you justify Mr. Vikas's argumentative tendency with the Chief Personnel Managers? Give reasons for your answer.

(d)Do you agree with suggestion offered by Mr. Vikas to link Human Resources Management with the company's strategic goals? If yes, suggest prominent areas where Human Resources Department can play role in this regard. [6+4+5+5]

Answer

(a) The first major issue raised in the case pertains to failure of the administration to realize the significant role Personnel Administrative and Human Resources Department can play in corporate strategy. This is evident from the remarks made by Mr. Amit Kapoor - the Chief Personnel Manager that the role of his department was only peripheral to company business and the strategic role playing was beyond its purview. He advised his Personnel Manager Mr. Vikas to confine his functions to routine personnel and industrial relation matters. The company has also failed to follow the principle of matching an appropriate candidate to the job requirements when it comes to appointment of Chief Personnel Manager. The company decided to send Mr. Amit Kapoor an automobile engineer from manufacturing department to Personnel Administration and Human Resources Department as head without realizing that latter job needed a person with qualification and experience in management of human resources. The company had almost adopted a similar attitude when it appointed Mr. Balram as replacement of Mr. Amit Kapoor. Even there seems to be lack of clarity in the career development plans of the company as Mr. Amit Kapoor a qualified automobile engineer is transferred to the personnel department. The whole idea behind career development plans is to develop a person's skills to match with his present job with the job he would be expected perform in future. The company has also failed to pay attention in developing organization culture in which superior-subordinate relationship, team work are strengthened to contribute to professional well-being, motivation and pride of employees. This become clear when the Personnel Manager's frequent arguments with the Chief Personnel Manager are not taken seriously and Mr. Vikas is just let off free without any strictures or warning for his behaviour by the higher authorities. There is also need for a system to encourage social networking amongst different employees in the organization which can help to create "Social Capital" as was made clear by Mr. Vikas when he suggested Mr. Amit Kapoor to take necessary measure in building 'Social Capital'. Even the transfer policies of the company need improvement. Mr. Amit Kapoor is transferred to Personnel Administration and Human Resources Department, and later to different assignment at company's overseas office. Even the General Manager had agreed to transfer Mr. Vikas

to another office of company outside Punjab simply at the insistence of Mr. Balram, the Chief Personnel Manager.

(b) On the matter of appointment of Chief Personnel Manager and in particular of Mr. Amit Kapoor the company ignored to match the qualification, experience and merit of the candidate with the job description and profile. The company should have recruited a person with degree in human resource management with adequate work experience to the position of the Chief Personnel Manager. Practically, the same mistake was committed in the appointment of Mr. Balram who had essentially experience of working as a Training Manager. In both the cases persons appointed lacked the needed qualification and experience for the top job in the personnel department. The direct fallout of this was that Mr. Vikas, the Personnel Manager did not have faith in the competence of his superior and he had frequent arguments whenever he differed with them in manner in which they handled some important issues relating to the industrial relations.

(c) Mr. Amit Kapoor the Chief Personnel Manager did not possess any formal degree in personnel management and industrial relations. However, this did not give any right to Mr. Vikas, Personnel Manager who reports to him to have frequent arguments on the manner of handling issues relating to personnel and industrial relations. If at all Mr. Vikas had some serious differences with Mr. Amit Kapoor and later with Mr. Balram who succeeded Mr. Amit Kapoor, he should have brought his view points to their notice in a more dignified manner keeping in view the hierarchy of the department. There could be two possible reasons for this tendency of Mr. Vikas. First, he appears to have complex that he is superior on account of his relevant qualification and as a result he developed ego. Secondly, it also seems that Mr. Vikas was rather impatient to rise in the career ladder and become the Chief Personnel Manager without gaining much work experience. To achieve this end, he wanted to belittle the Chief Personnel Managers on every opportunity that came his way. In any case, the argumentative tendencies tantamount to indiscipline and insubordination and cannot be justified. On the contrary, the top management should have sought his explanation on his frequent arguments with Chief Personnel Managers.

(d) Human resources policies and plans deal with the most precious resources of an organization. It is the people who carry out the various functions in production marketing, finance, etc. and the success of an organization depends upon the quality of people selected to their functions. This presupposes an integrated approach towards human resources functions and overall business functions of an organization. The human resources management practices of an organization can be important sources of competitive edges. In this context human resources manager / department can play an important strategic role in the following important areas:

- The human resources management must be able to lead people and organization towards desired goals and direction involving people right from the beginning.
- The human resources management can also help developing core competency by the firm.
- A significant role can also be played in building a highly committed and competent work force.

The human resources management can also help in developing healthy work ethics and culture and create an atmosphere of trust and goodwill to encourage creative and innovative ideas. Jobs can be redesigned to make them more challenging and rewarding.

2. (a) Formulate the following game as a Linear Programming problem from (i) A's and (ii) B's point of view. The player A is the maximizing player here.

		Strategy of Player B		
		B_1	B_2	B_3
Strategy of Player A	A_1	90	80	110
	A_2	110	120	90
	A_3	120	70	80

(b) Explain any eight productivity improvement techniques. [8+12]

Answer:

(a) Let p_1,p_2 and p_3 represent the probabilities with which A chooses strategies A_1 and A_2 respectively, while q_1, q_2 and q_3 be the probabilities in respect of B choosing strategies B_1, B_2 and B_3 such that

$p_1 + p_2 + p_3 = 1$ and $q_1 + q_2 + q_3 = 1$.

If the value of the game is v, then for player A, we must have

$90p_1 + 110\ p_2 + 120\ p_3 \geq v$, $80p_1 + 120\ P_2 + 70\ p_3 \geq v$, $110\ p_1 + 90\ p_2 + 80\ p_3 \geq v$ and for player B, we shall have

$90q_1 + 80q_2 + 110\ q_3 \leq v$, $110\ q_1 + 120\ q_2 + 90\ q_3 \leq v$, $120\ q_1 + 70\ q_2 + 80\ q_3 \leq v$

Let X_i be the probability that Player A would play ith strategy. If u be the value of the game, we define $x_i = p_i/u$, (i = 1, 2, 3). Similarly, let y_j be the probability that jth strategy would be played by Player B. If v be the game value, we define $y_j = q_j/v$, (j = 1, 2, 3). Accordingly, the problem is stated below.

From A's point of view:

Minimize $\frac{1}{U} = x_1 + x_2 + x_3$

Subject to the constraints

$90\ x_1 + 110\ x_2 + 120\ x_3 \geq 1$

$80\ x_1 + 120\ x_2 + 70\ x_3 \geq 1$

$110x_1 + 90\ x_2 + 80\ x_3 \geq 1$

$x_1, x_2, x_3 \geq 0$

For B's point of view:

Maximize $\frac{1}{V} = y_1 + y_2 + y_3$

Subject to the constraints

$90\ y_1 + 80y_2 + 110y_3 \leq 1$

$110\ y_1 + 120y_2 + 90y_3 \leq 1$

$120\ y_1 + 70\ y_2 + 80\ y_3 \leq 1$

$y_1, y_2, y_3 \geq 0$

(b) Twelve productivity improvement techniques are explained as follows:

(i) **Value Engineering (VE)** : Value Engineering (VE) is the process of improving the value of a product at every stage of the product life cycle. At the development stage, VE improves the value of a product by reducing the cost without reducing quality. At the maturity stage, VE reduces the cost by replacing the costly components (parts) by cheaper components. VE also tries to improve the value and quality of the product. Value is the satisfaction which the consumer gets by using the product. VE tries to give maximum value for a lowest price.

(ii) **Quality Circles (QC)** : The concept of Quality Circles (QC) was introduced in **1960** in **Japan**. QC is a small group of employees who meet regularly to identify, analyse, and solve problems in their department. The QC members advise the management to implement new methods to solve work-related problems. QC increases the productivity.

(iii) **Financial and Non-Financial Incentives** : The organisation must motivate the

employees by providing financial and non-financial incentives. The financial incentives include better wages and salaries, bonus, etc. The non-financial incentives include better working conditions, welfare facilities, worker's participation in management, etc.

(iv) **Operations Research (OR)** : Operations Research (OR) uses mathematical and scientific methods to solve management problems, including problems of productivity. QR technique uses a scientific method to study the alternative courses of actions and to select the best alternative. OR uses techniques such as linear programming, game theory, etc., to make the right decision. Thus, QR helps to improve productivity.

(v) **Training:** Training is a process of increasing the knowledge and skills of the employees. Training is a must, for new employees and experienced employees. Training increases the efficiency of the employee. Thus, training results in high productivity.

(vi) **Job Enlargement:** Job Enlargement is a horizontal expansion of a job. It is done to make jobs more interesting and satisfying. It involves increasing the variety of duties. For e.g. a typist may be given the job of accounts writing in addition to the typing work. This technique is used for lower level jobs.

(vii) **Job Enrichment:** Job Enrichment is a vertical expansion of a job. It makes routine jobs more meaningful and satisfying. It involves providing more challenging tasks, and responsibilities. For e.g. a manager who prepares performance reports is asked to make plans for his department. Job Enrichment technique is used for higher-level jobs.

(viii) **Inventory Control:** There must be a proper level of inventory. Overstocking and under stocking of inventories must be avoided. Overstocking of inventories will result in blocking of funds and there are chances of spoilage or misuse of materials. Under stocking of inventories will result in shortages. This will block the smooth flow of production, and so the delivery schedules will be affected.

(ix) **Materials 'management:** Materials' management deals with optimum utilization of materials in the manufacturing process. It involves scientific purchasing, systematic store keeping, proper inventory control, etc. The main objective of materials' management is to purchase the right quantity and quality materials, at the right prices, at the right time, to maintain favourable relations with suppliers, to reduce the cost of production, etc.

(x) **Quality Control** : The main objective of quality control is to produce good quality goods at reasonable prices, to reduce wastages, to locate causes of quality deviation and to correct such deviations, to make the employees quality conscious, etc.

(xi) **Job Evaluation:** Job Evaluation is a process of fixing the value of each job in the organisation. It is done to fix the wage rate for each job. A proper job evaluation increases the moral of the employees. This increases the productivity.

(xii) **Human factor engineering** : Human factor engineering refers to the man-machine relationship. It is designed to match the technology to a human requirement. The term **Ergonomics** has originated from the Greek word 'ergos' meaning 'Work' and 'nomikos' meaning 'Law'. So, it means 'Law of Work'. It tells us how to fit a job to a man's psychological and physiological characteristics to increase human efficiency and well-being.

[Answer any eight points]

3 (a) A company is planning to market a new model of a doll. Rather than setting the selling price of the doll based only on production cost estimation management polls the retailers of the doll to see how many dolls they will buy for various prices. From this survey, it is determined at the unit demand function (the relationship between the amount 'x' each retailer would buy and the price he would pay) is x = 30,000 – 1500P. The fixed cost of the production of the dolls are found to be ₹ 28,000 and cost of Material & labour to produce each doll is estimated to be ₹ 8 per unit. What price should the company charge retailer in order to obtain a maximum profit? Also find the maximum profit.

(b) Describe the role of the Management Accountant of Competitive Intelligence.

(c) A Company has sales of 1,00,000 units at a price of ₹ 200.00 per unit and profit of ₹ 40.00 Lakhs in the current year. Due to stiff competition, the Company has to reduce its price of product next year 5% to achieve same volume target of sales. The cost structure and profit for the current year is given as below:

Particulars	(₹ Lakhs)
Direct Material	60.00
Direct Wages	45.00
Variable Factory Overheads	20.00
Fixed Overheads including Sales & Admin Expenses	35.00
Total Cost	160.00

To achieve the Target Cost to maintain the same profit, the Company is evaluating the proposal to reduce Labour Cost and Fixed Factory Overheads. A Vendor supplying the Machine suitable for the Company's operations has offered an advanced technology Semi-Automatic Machine of ₹ 20 Lakhs as replacement of Old Machine worth ₹ 5.0 Lakhs. The Vendor is agreeable to take back the Old Machine at ₹ 2.70 Lakhs only. The Company's policy is to charge depreciation at 10% on WDV. The Maintenance Charge of the Existing Machine is ₹ 1.20 Lakhs per annum whereas there will be warranty of services free of cost for the New Machine first two years. There are ten (10) Supervisors whose Salary is ₹ 1.50 Lakhs per annum. The New Machine having Conveyor Belt is expected to help in cost cutting measures in the following ways –

- **Improve Productivity of workers by 20%**
- **Cut-down Material Wastage by 1%**
- **Elimination of services of Supervisors because of automatic facilities of the machine**
- **Saving in Packaging Cost by ₹ 1.5 Lakhs.**

Assuming Cost of Capital to be 15%, calculate how many Supervisors should be removed from the production activities to achieve the Target Cost.

(d) Mention the objectives of Customer Relationship Management. [5+6+5+4]

Answer:

(a) $X = 30,000 - 1,500P$

$x - 30,000 = -1,500P$

$\therefore P = \frac{30,000 - x}{1,500}$

$\text{Revenue} = \frac{30,000x - x^2}{1,500}$

$C = 8x + 28,000$

$\text{Profit (p)} = \frac{30,000x - x^2}{1,500} - 8x - 28,000$

$\frac{dp}{dx} = 1/1,500\ (30,000 - 2x) - 8 = 0$

or, $30,000 - 2x - 12,000 = 0$

or, $-2x = -18,000$

or, $x = 18,000/2 = 9,000$

or, $\frac{d^2p}{dx^2} = -2$, which is Negative

$\text{Profit} = \frac{30,000 \times 9,000 - 9,000^2}{1,500} - 72,000 - 28,000$

$= 26,000$

(b) Competitive intelligence is a process of gathering data, creating information and making decisions. Management Accountants are trained to gather data, assimilate data into information and make decisions based upon information, frequently with their management counterparts.

Competitive intelligence may also be viewed as a competitiveness audit, a concept that Management Accountants are familiar with. Management Accountants' training and experience make them well- suited to the requirements of the competitive intelligence process.

Management Accountants may be actively involved in introducing a competitive intelligence process in several ways:

- Identifying the need for a new or improved competitive intelligence process;
- Educating top management and other senior managers about that need;
- Developing a plan along with cross-functional team members for designing, developing and implementing the new, improved competitive intelligence practice, including its underlying architectures;
- Identifying the appropriate tools and techniques for conducting competitor analysis;
- Providing financial input, analysis and expertise to the competitive intelligence effort;
- Contributing to and using competitive intelligence in target costing;
- Ensuring that the competitive intelligence efforts are tied to the firm's goals, strategies, objectives and internal processes, as appropriate; and,
- Continually assessing the new, improved competitive intelligence process and its implications for the organization and continually improving the process.

(c) For the same quantity, Sales Value will reduce by 5% of (1,00,000 units x ₹ 200.00) = ₹ 10.00 lakhs. For maintaining the same amount of profit, cost also has to be reduced by ₹ 10.00 Lakhs, which can be achieved as under -

Particulars	₹ Lakhs
Savings: Reduction in Wages (**Note:** Due to higher Labour Productivity, Wages will be $\frac{45}{1.20}$ = ₹ 37.50 Lakhs)	7.50
Elimination of wastage of Materials = 1% of ₹ 60 Lakhs	0.60
Savings in Packaging Cost (given)	1.50
Saving in Maintenance Cost (given)	1.20
Sub-Total Savings (A)	10.80
Costs: Loss in Disposal of Old Machine (₹ 5 Lakhs – ₹ 2.70 Lakhs)	2.30
Difference in Depreciation (₹ 20 Lakhs – ₹ 5 Lakhs) x 10%	1.50
Cost of Capital Investment ₹ 20 Lakhs x 15%	3.00
Sub-Total Costs (B)	6.80
Effective Cost Reduction before considering removal of Supervisors(A-B)	4.00
Additional Reduction required for meeting Target Cost, by removing Supervisors = (₹ 10 Lakhs – ₹ 4 Lakhs)	6.00

Hence, number of Supervisors to be removed = $\frac{₹\,6\,\text{Lakhs}}{₹\,1.50\,\text{Lakhs per Supervisor}}$ = 4 Supervisors.

(d) Objectives for using CRM applications

Objectives of using CRM Applications, defined in the following line:

- To support the customer services
- To increase the effectiveness of direct sales force.
- To support of business to business activities.
- To support of business to consumer activities.
- To manage the call center.
- To operate the In- bound call centre.

- To operate the Out - bound call centre.
- To operate the Full automated(i.e. no CRM involvement, "lights out")

4. (a) The production function of a commodity is given by: $Q = 40x + 3x^2 - \frac{x^3}{3}$

Where q is the total output and x is the unit of input.

(i) Find the number of units of input required to give maximum output.

(ii) Find the maximum value of marginal product.

(iii) Verify that when the average product is maximum, it is equal to marginal product.

(b) Write a note on Contractual Terms in the context of Interaction of Transfer pricing and Taxation.

(c) Amit Ltd provides the following details on its new product.
Years 1 and 2: R & D Costs: ₹ 2,40,000, Design Costs ₹ 1,60,000 Years 3 to 6: Other Functional Costs:

Function	One-Time Costs	Costs per unit
Production	₹ 1,00,000	₹ 25
Marketing	₹ 70,000	₹ 24
Distribution	₹ 50,000	₹ 16
Customer Service	₹ 80,000	₹ 30

The sale quantities during the Product Life Cycle at various Selling Prices are

Selling Price per unit (₹)	400	480	600
Sale Quantity in units	5,000	4,000	2,500

Ignoring time value of money, compute the Net Incomes generated over the Product Life Cycle at various prices. Which price should the Company select?

(d) Describe the role of Demand in Pricing Decisions. **[6+4+6+4]**

Answer:

(a) (i) $\frac{dQ}{dx} = 40 + 6x - x^2$. For maximum or minimum, we have $40 + 6x - x^2 = 0$

or, $(x - 10)(x + 4) = 0$; or, $x = 10, -4$.

Again, $\frac{d^2Q}{dx^2} = 6 - 2x$ for $x = 10$, $\frac{d^2Q}{dx^2} = 6 - 2 \times 10 = 6 - 20 = -14 < 0$, max.

So, for input of 10 units, output is maximum.

(ii) Marginal product (MP) = $\frac{dQ}{dx} = 40 + 6x - x^2$.

Now, $\frac{d(MP)}{dx} = 6-2x$. For max. or min. $6 - 2x = 0$, $x = 3$.

Again, $\frac{d^2(MP)}{dx^2} = -2 < 0$, max.

So, maximum value of marginal product = $40 + 6x3 - 32 = 40+18-9 = 49$

(iii) Average product (AP) = $\frac{Q}{x} = \frac{40x + 3x^2 - \frac{x^3}{3}}{x} = 40 + 3x - \frac{x^2}{3}$

For max. or min., $\frac{d(AP)}{dx^2} = \frac{-2}{3} < 0$, max.

So, maximum value of AP = $40 + 3 \times \frac{9}{2} - \frac{1}{3}\left(\frac{9}{2}\right)^2 = 46.75$

Again, MP = (for $x = \frac{9}{2}$) = $40 + \frac{6 \times 9}{2} - \left(\frac{9}{2}\right)^2 = 46.75$

(b) Contractual terms

Contractual arrangements are the starting point for determining which party to a transaction bears the risk associated with it. Accordingly, it would be a good practice for associated enterprises to document in writing their decisions to allocate or transfer significant risks before the transactions with respect to which the risks will be borne or transferred occur, and to document the evaluation of the consequences on profit potential of significant risk reallocations. Where no written terms exist, the contractual relationships of the parties must be deduced from their conduct and the economic principles that generally govern relationships between independent enterprises.

A tax administration is entitled to challenge the purported contractual allocation of risk between associated enterprises if it is not consistent with the economic substance of the transaction. Therefore, in examining the risk allocation between associated enterprises and its transfer pricing consequences, it is important to review not only the contractual terms but also the following additional questions:

- Whether the conduct of the associated enterprises conforms to the contractual allocation of risks,
- Whether the allocation of risks in the controlled transaction is arm's length, and
- What the consequences of the risk allocation are.

(c)

Income Statement

Particulars	Option I	Option II	Option III
1. Life Cycle Sales Quantity	5,000 units	4,000 units	2,500 units
2. Life Cycle Selling Price p.u.	₹400	₹480	₹600
3. Life Cycle Sales Revenue (1x2)	₹ 20,00,000	₹ 19,20,000	₹ 15,00,000
4. Life Cycle Functional Costs			
(a)Research and Development	₹ 2,40,000	₹ 2,40,000	₹ 2,40,000
(b) Design	₹ 1,60,000	₹ 1,60,000	₹ 1,60,000
(c) Production One Time	₹ 1,00,000	₹ 1,00,000	₹ 1,00,000
Variable	5000 x ₹ 25 =₹1,25,000	4000 x ₹25=₹1,00,000	2500 x ₹25=₹62,500
(d) Marketing One Time	₹ 70,000	₹ 70,000	₹ 70,000
Variable	5000 x ₹ 24 =₹1,20,000	4000 x ₹ 24 = ₹96,000	2500 x ₹24=₹60,000
(e) Distribution One Time	₹ 50,000	₹ 50,000	₹ 50,000
Variable	5000 x ₹ 16 = ₹ 80,000	4000 x ₹ 16 = ₹ 64,000	2500 x ₹ 16 = ₹ 40,000
(f) Customer Service One Time	₹ 80,000	₹ 80,000	₹ 80,000
Variable	5000 x ₹ 30 =₹1,50,000	4000 x ₹30=₹1,20,000	2500 x ₹30=₹75,000
Life Cycle Total Costs	₹ 11,75,000	₹ 10,80,000	₹ 9,37,500
5. Life Cycle Net Income	₹ 8,25,000	₹ 8,40,000	₹ 5,62,500

Conclusion: The Company may select Price of ₹ 480 to maximize Profits. Assumed that R&D Costs and Design Costs represent Total Costs incurred in 2 Years.

(c) The Role of Demand in Pricing Decisions

How a business firm's buyers respond to a change in price is an important consideration, for the eventual effect on sales volume and revenue is determined by the degree of buyer's demand sensitivity to price changes. However, price –setters the following four points:

(i) **Market Vs Firm Elasticity:**

Price elasticity of demand is a measure of the degree to which buyers are sensitive to price changes. In any market characterized by several functionally substitutable products, there are actually two demand schedules: 1) demand for the general product (primary demand) and 2) demand for the firm's specific offering (secondary demand). In general, secondary demand is found to be more price elastic. But a seller may sometimes mistake relatively inelastic market or primary demand as elastic secondary demand.

(ii) **Demand for buyer's Output:**

The Market for buyer's products may actually be price-elastic. So a reduction in price by a firm would raise demand for its product. Hence, manufacturers selling to such buyers, and whose product represents a significant portion of these buyers product costs may curtail sales opportunities by eliminating discounts or low margin products.

(iii) **Likelihood of Competitive Entry:**

K.B. Monroe has pointed out that "an emphasis on high-price strategies may encourage the entry of competitors when entry barriers are minor and when demand is actually price-elastic. Moreover, high prices or rapidly increasing prices may force buyers to reconsider their need and, perhaps, actively seek out competitive substitutes.

(iv) **Demand Consequences of a Product Line:**

Most firms sell a wide variety of products requiring a variety of different marketing strategies. Within a product line there are usually some products that are functional substitutes for each other and some products that are functionally complementary. For example, a photographic product line includes such items like cameras, films, flash bulbs, projectors, screens and other accessories. Because of the demand interrelationships and because there are usually several price-market targets, the product line pricing problem throws a major challenge before the marketing executives.

Section – B
[Answer any 2 questions from this section]

5. (a) State the problems are addressed by Supply Chain Management.
(b) Describe about the Recurrent Artificial Neural Network. [6+4]

Answer:

(a) Supply Chain Management must address the following problems:

- **Distribution Network Configuration**: Number, location and network missions of suppliers, production facilities, distribution centers, warehouses, cross-docks and customers.
- **Distribution Strategy:** Questions of operating control (centralized, decentralized or shared); delivery scheme, e.g., direct shipment, pool point shipping, cross docking, direct store delivery (DSD), closed loop shipping; mode of transportation, e.g., motor carrier, including truckload, Less than truckload (LTL), parcel; railroad; intermodal transport, including trailer on flatcar (TOFC) and container on flatcar (COFC); ocean freight; airfreight; replenishment strategy (e.g., pull, push or hybrid); and transportation control (e.g., owner-operated, private carrier, common carrier, contract carrier, or third-party logistics (3PL)).
- **Trade-Offs in Logistical Activities**: The above activities must be well coordinated in order to achieve the lowest total logistics cost. Trade-offs may increase the total cost if only one of the activities is optimized. For example, full truckload (FTL) rates

are more economical on a cost per pallet basis than LTL shipments. If, however, a full truckload of a product is ordered to reduce transportation costs, there will be an increase in inventory holding costs which may increase total logistics costs. It is therefore imperative to take a systems approach when planning logistical activities. These trades-offs are key to developing the most efficient and effective Logistics and SCM strategy.

- **Information**: Integration of processes through the supply chain to share valuable information, including demand signals, forecasts, inventory, transportation, potential collaboration, etc.
- **Inventory Management**: Quantity and location of inventory, including raw materials, work-in-process (WIP) and finished goods.
- **Cash-Flow**: Arranging the payment terms and methodologies for exchanging funds across entities within the supply chain.

(b) Recurrent Artificial Neural Networks

Artificial neural network with the recurrent topology is called Recurrent Artificial neural network. It is similar to feed-forward neural network with no limitations regarding back-loops. In these cases information is no longer transmitted only in one direction but it is also transmitted backwards. This creates an internal state of the network which allows it to exhibit dynamic temporal behaviour. Recurrent artificial neural networks can use their internal memory to process any sequence of inputs. The following figure shows small Fully Recurrent artificial neural network and complexity of its artificial neuron interconnections. The most basic topology of recurrent artificial neural network is fully recurrent artificial network where every basic building block (artificial neuron) is directly connected to every other basic building block in all direction. Other recurrent artificial neural networks such as Hopfield, Elman, Jordan, bi-directional and other networks are just special cases of recurrent artificial neural networks.

6. (a) "Government can, however, play an important role in examining the economic and social impact of ecommerce technologies and in promoting understanding and application of these technologies throughout Indian industries and communities." – Describe any 5 role of the government.

(b) Explain about the Fuzzy sets in HR Management. [5+5]

Answer:

(a) Government can, however, play an important role in examining the economic and social impact of ecommerce technologies and in promoting understanding and application of these technologies throughout Indian industries and communities.

(i) Facilitating market access and business opportunities, especially for small, medium, and micro enterprises (SMMEs), on a national and global scale.

(ii) Providing educational and skills development resources.

(iii) Supporting the rapid deployment of necessary infrastructure.

(iv) Facilitating the development of MPCCs as vibrant seeding points for community knowledge and wealth creation, above and beyond the provision of the latest ICTs.

(v) Developing "model use" programmes for the dissemination of government information and services using e-commerce platforms, e.g., for electronic tender processes.

(vi) Supporting necessary transitions in the labor force due to technological and industrial transformation.

(vii) Ensuring equity in the availability of opportunities and benefits, in the context of the overall development of Indian rural community.

[Answer any 5 points]

(b) Fuzzy sets are sets whose elements have degrees of membership. Fuzzy sets were introduced by Lotfi A. Zadeh and Dieter Klaua in 1965 as an extension of the classical notion of set. At the same time, Salii (1965) defined a more general kind of structures called L-relations, which were studied by him in an abstract algebraic context.

Fuzzy Sets in HR Management

This project specializes in the implementation of the Microsoft Dynamics NAV information system. The evaluation of employees is based on multiple criteria evaluations. The criteria are derived from typical competencies of the employees. A competency model has been created for any given role with different normalized weights assigned to various competencies. The evaluation proceeds in the following manner: Firstly, the appointed evaluators fill in a questionnaire indicating to what extent, in their view, the tested employee meets his/her competencies. These evaluations are expressed using fuzzy scales. Normalized weights assigned to the evaluators of any given employee are set based on the intensity of cooperation between the employee and his/her evaluators. The level of fulfillment of each competency by the given employee is calculated as a weighted average of the fuzzy evaluations, conducted by each of his/her evaluators. Then, the overall fulfillment level of the employee's working role, again as a weighted average of fuzzy numbers, is calculated according to a specified model. This produces an overall evaluation of the employee. The evaluation process is followed by an interview where the employee is informed of his/her evaluation results, the employees gaps are discussed, and possibilities for improvement are proposed.

7. (a) Discuss the potential impact of Computers and MIS on different levels of management.
(b) Mention any six objectives of Management Information Systems. [7+3]

Answer:

(a) The potential impact of computers on top-level management may be quite significant. An important factor which may account for this change is the fast development in the area of computer science. It is believed that in future computers would be able to provide simulation models to assist top management in planning their work activities. For example, with the help of a computer it may be possible in future to develop a financial model by using simulation technique, which will facilitate the executives to test the impact of ideas and strategies formulated on future profitability and in determining the needs of funds and physical resources.

Futurists believe that top management will realize the significance of techniques like Simulation, Sensitivity Analysis and Management Science. The application of these techniques to business problems with the help of computers would generate accurate, reliable, timely and comprehensive information to top management. Such information would be quite useful for the purpose of managerial planning and decision-making. Computerized MIS will also influence in the development, evaluation and implementation of a solution to a problem under decision making process.

Potential Impact of Computers and MIS on middle management level will also be significant. It will bring a marked change in the process of their decision-making. At this level, most of the decisions will be programmed and thus will be made by the computer, thereby drastically reducing the requirement of middle level managers. For example, in the case of inventory control system, computers will carry records of all items in respect of their purchase, issue and balance. The re-order level, re-order quantity etc., for each item of material will also be stored in computer after its predetermination. Under such a system, as soon as the consumption level of a particular item of material will touch reorder level, computer will inform for its purchase immediately.

The impact of Computers and MIS today at supervisory management level is maximum. At this level, managers are responsible for routine, day-to-day decisions

and activities of the organization which do not require much judgment and discretion. In a way, Supervisory manager's job is directed more towards control functions, which are highly receptive to computerization.

Potential impact of computers and MIS on supervisory level will completely revolutionize the working at this level. Most of the controls in future will be operated with the help of computers. Even the need of supervisory managers for controlling the operations will be substantially reduced. Most of the operations/activities now performed manually will be either fully or partially automated.

(b) Objectives of MIS

(i) To provide the managers at all levels with timely and accurate information for control of business activities

(ii) To highlight the critical factors in the operation of the business for appropriate decision making

(iii) To develop a systematic and regular process of communication within the organization on performance in different functional areas

(iv) To use the tools and techniques available under the system for programmed decision making

(v) To provide best services to customers

(vi) To gain competitive advantage

(vii) To provide information support for business planning for future

[Answer any 6 points]

Section C
[Answer any 2 questions from this section]

8. (a) Describe the Performance-Related measures in the context of Corporate Risk Management.

(b) Explain about the Exchange Rate Risk and Liquidity Risk. [6+(2+2)]

Answer:

(a) Performance - Related measures in the context of Corporate Risk Management are those which concentrate on the mid-region of the probability distribution, i.e., the region near the 'mean' and are relevant for determination of the volatility around expected results.

The following are some of the Performance - related measures in the context of Corporate Risk Management.

i. **Return on Equity -** Net Income divided by Net Worth.

ii. **Operating Earnings -** Net Income from continuing operations, excluding realized investment gains.

iii. **Earnings before Interest -** Dividends, Taxes, Depreciation and Amortization (EBITDA).A form of cash flow measure for evaluating the operating performance of companies with high levels of debt.

iv. **Cash Flow Return on Investment (CFROI) -** EBITDA divided by tangible assets.

v. **Weighted Average Cost of Capital (WACC) -** The sum of the required market returns of each component of corporate capitalization, weighted by that component's share of the total capitalization.

vi. **Economic Value Added (EVA) -** A corporate performance measure that stresses the ability to achieve above the firm's cost of capital.

(b) Exchange Rate Risk:

Exchange Rate Risk Management through asset-liability management: At a particular exchange rate assets and liabilities of a financial institution match exactly. As the exchange rate fluctuates this balance gets disturbed. A simple solution to correct this risk is to match assets and liabilities of the same currency. Many financial institutions do not have foreign exchange exposure as all their assets and liabilities are in rupee currency. The risk of foreign exchange borrowings of these institutions are passed on to the lenders through dollar denominator loans. The uncovered loans are hedged at the time of contracting them through forward covers for the entire amount.

Liquidity Risk:

It is that portion of an asset's total variability of return which results from price discounts given or sales commissions paid in order to sell the asset without delay. It is a situation wherein it may not be possible to sell the asset. Assets are disposed off at great inconvenience and cost in terms of money and time. Any asset that can be bought or sold quickly is said to be liquid. Failure to realize with minimum discount to its value of an asset is called liquidity risk.

9. Discuss Altman's Model and Explain the Five Z – Score Constituent Ratios. [10]

Answer:

The Altman Model: Z-Score

The Z-Score model is a quantitative model developed by Edward Altman in 1968, to predict bankruptcy or financial distress of a business. The Z-score is a multi variate formula that measures the financial health of a company and predicts the probability of bankruptcy within 2years. This model involves the use of a specified set of financial ratios and a statistical method known as a Multiple Discriminant Analysis. (MDA). The real world application of the Altman score successfully predicted 72% of bankruptcies two years prior to their failure.

The model of Altman is based on a linear analysis in which five measures are objectively weighted and summed to arrive at an overall score that then becomes the basis for classification of companies into one of the two a priori groupings that is bankrupt or non-bankrupt. These five indicators were then used to derive a Z-Score. These ratios can be obtained from corporations' financial statements.

The Five Z-Score Constituent Ratios are:

- **Working Capital/Total Assets (WC/TA):-** a firm with negative working capital is likely to experience problems meeting its short-term obligations.
- **Retained Earnings/Total Assets: -** Companies with this ratio high probably have a history of profitability and the ability to stand up to a bad year of losses.
- **Earnings before Interest & Tax/ Total Assets: -** An effective way of assessing a firm's ability to profit from its assets before things like interest and tax are deducted.
- **Market Value of Equity/ Total Liabilities: -** A ratio that shows, if a firm were to become insolvent, how much the company market value would declines before liabilities exceed assets.
- **Sales/Total Assets: -** A measure of how management handles competition and how efficiently the firm uses assets to generate sales.

  Based on the Multiple Discriminant Analysis, the general model can be described in the following form:

  Z=1.2WC/TA + 1.4 RE/TE + 3.3 EBIT/TA + 0.6 MVE/TL + 1.0 SL/TA

10. Discuss about the Probability of Ruin and Risk Pooling. [6+4]

Answer:

Probability of Ruin:

Ruin theory also known as collective risk theory, was actually developed by the insurance industry for studying the insurers vulnerability to insolvency using mathematical modeling. It is based on the derivation of many ruin-related measures and quantities and specifically includes the probability of ultimate ruin. This can be also related to the sphere of applied probability as the techniques used in the ruin theory as fundamentally arising out of stochastic processes. Many problems in ruin theory relate to real-life actuarial studies but the mathematical aspects of ruin theory have really been of interest to actuarial scientists and other business research people.

Normally an insurers' surplus has been computed as the net of two opposing cash flows, namely, cash inflow of premium income collected continuously at the rate of c and the cash outflow due to a series of insurance claims that are mutually independent and identically distributed with a common distribution function P(y). The path of the series of claims is assumed to respond to a Poisson process with intensity rate which would mean that the number of claims received N(t) at a time frame of t is controlled by a Poisson distribution with a mean λ_t. Therefore, the insurer's surplus at any time t is represented by the following-formula:

$$X(t) = X + Ct - \sum_{i=0}^{N(t)} Y_i$$

Where, the business of the insurer starts with an initial level of surplus capital.

X(0) = x under probability measure as explained in the previous paragraph.

In short, this theory of the probability of ruin is applied in the case of risk of insolvency of a company with diversified business activity. For the purpose of study, resources between diversified activities are allowed to be transferred and are limited by costs of transaction. Terminal insolvency happens when capital transfers between the business lines are not able to compensate the negative positions. Actuarial calculations are involved in the determination of ultimate ruin as discussed.

Risk Pooling

The concept of pooling risk is the process of identification of separate risks and put them all together in a single basket, so that the monitoring, combining, integrating or diversifying risk can be implemented.

Monitoring becomes easier when the specific agency put in charge knows that all the risks have been identified and they are being monitored according to the system drawn up to quantify the total risk through pooling and with a control figure i.e., plan the way to monitor, actually monitor and then check whether there are variations from the monitoring exercise and then act to correct the deviation. This correction act can be combining risks or integrating risks or diversifying risks.

For example, whenever a project is put up. Transit Insurance is taken for transporting the various plant and machinery from the manufacturers to the project site. The materials are then received at the site and stored until erection. Storage Insurance will cover the risk during the storage. During erection of different plant & machinery, risks due to mechanical, electrical etc., are covered through erection Insurance. The erected plant & machinery is then tested and trial runs are taken for guarantee purposes on continuous run. All these risks put together is called pooling. This single pooled policy has a risk value and premium payable and the conditions attached thereto by both the insurer and the insured to carry out those obligations are clearly spelled out in the policy documents.