Paper 9 – Operation Management & Strategic Management

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Full Marks: 100   **Time allowed: 3 hours**

Section – A

I. Answer all: [5×1=5]

1. Choose the correct answer:

(I) The following establishes time sequence of operations:
   (A) Routing,
   (B) Sequencing,
   (C) Scheduling,
   (D) Dispatching.

(II) Arrangement of machines depending on sequence of operations happens in:
   (A) Process Layout,
   (B) Product Layout,
   (C) Hybrid Layout,
   (D) Group Technology Layout.

(III) Linear programming is a technique used for determining:
   (A) Production Programme,
   (B) Plant Layout,
   (C) Product Mix,
   (D) Manufacturing sequence.

(IV) Issuing necessary orders, and taking necessary steps to ensure that the time targets set in the schedules are effectively achieved is known as :
   (A) Routing,
   (B) Dispatching,
   (C) Scheduling,
   (D) Inspection.

(V) Preventive maintenance is useful in reducing:
   (A) Inspection Cost,
   (B) Shutdown Cost,
   (C) Cost of premature replacement,
   (D) Set-up cost of machine.

2. Examine each statement and indicate whether it is 'True' or 'False':   [5×1=5]

(I) A special purpose machine Tool performs only a limited number of specialized operations with great speed and precision.
(II) Strikes and lock-out are controllable factors affecting Capacity Planning.
(III) Incentives are substitute for lower wages.
(IV) Linear programming does not consider uncertainties.
(V) Depending on the need, the maintenance activity may be centralized or decentralized.

3. Match the terms in Column I with the relevant terms in Column II: **[5×1=5]**

Column I	Column II
(A) Inventory Control	(i) Turbo-Alternator
(B) Network Analysis	(ii) Crashing
(C) Aviation Fuel	(iii) Value Analysis
(D) Hydro-electricity	(iv) stock Level
(E) Improvement in productivity	(V) Refinery

4. Put an appropriate word in blank position: **[4×1=4]**

   (i) _____ focuses on such areas as inventory goods and wages budgets.
   (ii) IBFS is optimal and unique when all numbers in the _____ are non-negative.
   (iii) The investment on machines in a straight line layout is _____ than the investment on machines in a functional layout.
   (iv) One of the important chart used in programme control is _____.

II. Answer any three of the following: **[17×3=51]**

5. **(a)** The following data on the exports of any item by a company during the various years fit a straight line, (for the time being, assume that a straight line gives a good fit). Give a forecast for the years 2013 and 2014 **[8]**

Year	No. of items ('000)
2004	13
2005	20
2006	20
2007	28
2008	30
2009	32
2010	33
2011	38
2012	43

(b) A manager has to decide about the number of machines to be purchased. He has three options i.e., purchasing one, or two or three machines. The data are given below.

Number of machine	Annual fixed cost	Corresponding range of output
One	₹12,000	0 to 300
Two	₹15,000	301 to 600
Three	₹21,000	601 to 900

Variable cost is ₹20 per unit and revenue is ₹50 per unit
   (a) Determine the break-even point for each range
   (b) If projected demand is between 600 and 650 units how many machines should the manager purchase? **[6+3]**

6. **(a)** The manager of a book store has to decide the number of copies of a particular tax law book to order. A book costs ₹60 and is sold for ₹80. Since some of the tax laws change year after year, any copies unsold while the edition is current must be sold for ₹30. From past records, the distribution of demand for this book has been obtained as follows: **[12]**

Demand (No of copies)	15	16	17	18	19	20	21	22
Proportion	0.05	0.08	0.20	0.45	0.10	0.07	0.03	0.02

Using the following sequence of random numbers, generate the demand for 20 time periods (year). Calculate the average profit obtainable under each of the courses of action open to the manager. What is the optimal policy?

14	02	93	99	18	71	37	30	12	10
88	13	00	57	69	32	18	08	92	73

(b) A firm is using a machine whose purchase price is ₹15,000. The installation charges amount to ₹3,500 and the machine has a scrap value only ₹1,500 because the firm has the monopoly of this type of work. The maintenance cost in various year is given in the following table:

Year	1	2	3	4	5	6	7	8	9
Maintenance Cost (₹)	260	760	1100	1600	2200	3000	4100	4900	6100

The firm wants to determine after how many years should the machine be replaced on economic considerations, assuming that machine replacement can be done only at the year end. **[5]**

7. (a) A department works on 8 hours shift, 288 days a year and has the usage data of a machine, as given below:

Product	Annual Demand (Units)	Processing time (Standard time in hours)
A	325	5.0
B	450	4.0
C	550	6.0

Calculate (a) processing time needed in hours to produce products A, B and C, (b) Annual production capacity of one machine in standard hours, and (c) Number of machines required. **[10]**

(b) A department works on 8 hours shift, 250 days a year and has the usage data of a machine as given below:

Product	Annual Demand (Units)	Processing time (Standard time in hours)
A	325	5.0
B	450	4.0
C	550	6.0

Determine the number of machines required. **[7]**

8. (a) A salesman has to visit five cities A,B,C,D and E. The inter-city distances are tabulated below. Note the distances between two cities need to be same both ways.

From / To	A	B	C	D	E
A	-	12	24	25	15
B	6	-	16	18	7
C	10	11	-	18	12
D	14	17	22	-	16
E	12	13	23	25	-

Note further that the distances are in km. **[8]**

(b) Six salesman are to be allocated to six sales regions so that the cost of allocation of the job will be minimum. Each salesman is capable of doing the job at different cost in each region. The cost matrix is given below:

Salesman		Region					
		I	II	III	IV	V	VI
	A	15	35	0	25	10	45
	B	40	5	45	20	15	20
	C	25	60	10	65	25	10
	D	25	20	35	10	25	60
	E	30	70	40	5	40	50
	F	10	25	30	40	50	15

(a) Find the allocation to give a minimum cost what is the cost?
(b) Now suppose the above table gives earning of each salesman at each region. How can you find an allocation so that the earning will be maximum? Determine the solution with optimum earning.
(c) There are restrictions for commercial reasons that A cannot be posted to region V and E cannot be posted to region II. Write down the cost matrix suitable after imposing the restrictions. **[9]**

9. **Write a note:** **[5+5+7=17]**
   (a) Economic Batch quantity;
   (b) Plant Layout;
   (c) Aggregate Planning Strategies.

Section – B

III. Answer all: **[1×6=6]**

10. **For each part below, choose the most appropriate answer out of the following options given:**

   (I) A corporate strategy can be defined as:
      (a) A list of actions about operational planning and statement of organizations structure and control system;
      (b) A statement of how to compete, direction of growth and method of assessing environment;
      (c) Abatement of organisation's activities and allocation of resources;
      (d) A course of action or choice of alternatives, specifying the resources required to achieve certain stated objectives;
      (e) A statement of where and how the company will prefer to operate.

   (II) Degree of involvement of Board of Directors may vary from passive to active level. It may participate in one or more of the following activities (state which ones are more appropriate as a judicious mix):
      (a) It constantly oversees the company's mission, objectives and policies;
      (b) It approves issues like R & D, foreign collaborations, linkages with financial institutions;
      (c) Capital budgeting, new product launch and competitive strategy building;
      (d) It tries to ensure that the company remains aligned with changing social, political and economic milieu;

(e) Oversees only the financial performance of the company.

(III) The essential ingredients of Business Process Re-engineering are:
   (a) Continuous improvements of products, processes and technologies.
   (b) Advanced planning in the areas of technologies, processes and strategic partnerships etc.
   (c) Fundamental rethinking and radical redesign of business process to achieve dramatic results.
   (d) Generation, comparison and evolution of many ideas to find out one worthy of development.
   (e) Identification and selection of layouts most suited for products and processes.

(IV) Organization culture is:
   (a) appreciation for the arts in the organization
   (b) ability of the organization to act in a responsible manner to its employees
   (c) combination of (a) and (b) above
   (d) deeper level of basic assumptions and beliefs that are shared by the members of the firm
   (e) none of the above.

(V) Ansoff proposed that for filling the corporate planning gap, one follows four strategies namely.
   (a) market penetration, product differentiation, market identification and diversification;
   (b) market penetration, product development, marketing research and diversification;
   (c) market penetration, product development, market development and diversification;
   (d) market identification, product development, positioning and diversification;
   (e) differentiation, product innovation, market opportunity and diversification.

(VI) The existence of price-wars in the airline industry in India indicates that
   (a) Customers are relatively weak because of the high switching costs created by frequent flyer programs.
   (b) The industry is moving towards differentiation of services
   (c) The competitive rivalry in the industry is severe
   (d) The economic segment of the external environment has shifted, bat the airline strategies have not changed.

IV. Answer any three: [8×3=24]

11. **(a)** What are the major steps in Strategic Management Process?
   (b) Discuss Contingency Planning and its seven steps process.
   (c) Write a note on Participator Management.
   (d) State the importance of Strategic Management Process.