PG-500

II Semester M.Com. (CBCS) Examination, July - 2019
COMMERCE 10287
Paper 2.5 : Operation Research and Quantitative Techniques

Time : 3 Hours

Max. Marks : 70

Instruction : *Answer to* **all** *the questions.*

SECTION - A

Answer **any seven** questions out of **ten**. Each question carries **two** marks.

7x2=14

1. (a) What are non-negativity constraints ?
    (b) What do you mean by non-degeneracy ?
    (c) What is Fulkerson rule ?
    (d) Give the meaning of cost-time trade off in network analysis.
    (e) Give the meaning of the term free ploat.
    (f) What is the probability of atleast two tails in four tosses of a coin ?
    (g) What are collectively exhaustive events ?
    (h) State the limitations of ARR.
    (i) What is the cost associated with inventory ?
    (j) Define EVPI. How it is calculated ?

SECTION - B

Answer **any four** questions out of **six**. Each question carries **five** marks.

4x5=20

2. Write short notes on decision theory, its main features and limitations.

3. A company uses annually 70,000 units of an item. Each costing ₹ 2.25, each order costs ₹ 43 and inventory carrying charges 14% of the annual average inventory value.
    (a) Find EOQ.
    (b) If the company operates 270 days a year, the procurement time is 12 days and safety stock is 620 units, find the re-order level, maximum, minimum and average inventory values.

4. Explain the properties of Poisson Distribution.

P.T.O.

5. A company has 5 jobs to be done on five machines. Any job can be done on any machine. The cost of doing the jobs on different machines are given below. Assign the jobs for different machines so as to minimize the total cost.

Jobs	Machines				
	A	**B**	**C**	**D**	**E**
1	13	8	16	18	19
2	9	15	24	9	12
3	12	9	4	4	4
4	6	12	10	8	13
5	15	17	18	12	20

6. A single lot of 20 electronic components are known to include 3 defective parts. If a 4 sample of component is selected at random from the lot :

   (a) What is the probability that this sample does not contain more than one defective ?

   (b) What is the probability that this sample will include at least one defective ?

7. Explain the different types of risks faced by the entrepreneur regarding capital budgeting.

SECTION - C

Answer **any three** questions out of **five**. Each question carries **twelve** marks.

$$3 \times 12 = 36$$

8. Explain the significance of Probability Distribution theories in decision making.

9. Solve the following Linear Programming Model :

   Max $Z = 40X_1 + 35X_2$

   Subject to the Constraints

   $2X_1 + X_2 \leq 60$

   $4X_1 + 3X_2 \leq 70$

   $6X_1 + 5X_2 \leq 90$

   $X_1, X_2, X_3 \geq 0$

10. The following table gives data on normal time and cost and crash time and cost for a project.

Activity	Duration normal	(weeks) crash	Total Cost normal (₹)	(₹) crash
1 - 2	6	4	400	450
2 - 3	5	4	500	500
2 - 4	6	3	300	280
2 - 5	4	2	600	400
3 - 4	5	3	300	420
4 - 6	4	3	100	210
5 - 6	3	1	250	140

(a) Draw the network and find out the critical path and the normal project duration.

(b) Find out the total float associated with each activity.

(c) If the indirect costs are ₹ 210 per week, find out the optimum duration by crashing and the corresponding project costs.

11. The average selling price of houses in a city is ₹ 60,00,000 with standard deviation of ₹ 15,00,000. Assuming the distribution of selling price to be normal, find :

(a) The percentage of houses that sell for more than ₹ 57,00,000.

(b) The percentage of houses that sell between ₹ 46,00,000 to 59,00,000.

(c) The percentage of houses that sell for more than ₹ 45,00,000.

12. Write short notes on :

(a) Decision tree

(b) Simulation in financial management

(c) Procedure for Vogel's approximation method

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