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PG – 533

II Semester M.Com. Degree Examination, July 2017
(CBCS)
COMMERCE
Paper – 2.5 : Operation Research and Quantitative Techniques

Time : 3 Hours Max. Marks : 70

SECTION – A

1. Answer **any seven** of the following sub-questions in about **3-4** lines **each**. **Each** sub-question carries **two** marks : **(7×2=14)**
   a) Define linear programming.
   b) What is non-degenerate Basic Feasible Solution ?
   c) What do you mean by model with one price break ?
   d) What do you mean by probability ?
   e) Define the term capital budgeting.
   f) What do you mean by Independent Float ?
   g) Define Operational Research.
   h) What do you mean by decision tree analysis ?
   i) State the uses of EOQ.
   j) What is EMV under Decision Theory ?

SECTION – B

Answer **four** of the following in about **one page**. **Each** question carries **5** marks : **(4×5=20)**

2. "PERT provides the framework with which a project can be described, scheduled and the controlled" – Discuss.

3. 12 'one rupee' coins are distributed at random among 5 beggars A, B, C, D and E. Find the probability that :
   i) They get 4, 2, 0, 5 and 1 coins respectively
   ii) Each beggar gets at least two coins and
   iii) None of them goes empty handed.

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

5. In a plant layout, four different machines M1, M2, M3 and M4 are to be erected in a machine shop. There are five vacant areas A, B, C, D and E. Because of limited space, Machine M2 cannot be erected at area C and Machine M4 cannot be erected at area A. The cost of erection of machines is given below :

		Area				
		A	B	C	D	E
Machines	M1	4	5	9	4	5
	M2	6	4	–	0	3
	M3	4	5	8	5	1
	M4	–	2	6	1	2

6. Explain what is meant by probability distribution of a random variable ? How is it useful in decision making ?

7. Geetha Perfume Company produces both perfumes and body spray from two flower extracts F1 and F2. The following data is provided :

	Liters of Extract		
	Perfume	**Body Spray**	**Daily Availability (ltrs)**
Flower Extract, F1	8	4	20
Flower Extract, F2	2	3	8
Profit per litre (Rs.)	7	5	

The maximum daily demand of body spray is 20 bottles of 100 ml each. A market survey indicates that the daily demand of body spray cannot exceed that of perfume by more than 2 litres. The company wants to find out the optimal mix of perfume and body spray that maximizes the total daily profit. Formulate the problem as a linear programming model.

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SECTION – C

Answer **any three** of the following. **Each** question carries **12** marks : **(3×12=36)**

8. What is decision making under uncertainty ? Describe the methods which are useful for decision-making under uncertainty.

9. Solve the following LPP by graphical method :

Minimize $Z = 18x_1 + 12x_2$

Subject to constraints, $2x_1 + 4x_2 \leq 60$

$3x_1 + x_2 \geq 30$

$8x_1 + 4x_2 \geq 120$

Where $x_1, x_2 \geq 0$.

10. Draw the network for the following project given in Table below :

Activity	Preceded by Initial activity	Duration (weeks)
A	–	10
B	A	9
C	A	7
D	B	6
E	B	12
F	C	6
G	C	8
H	F	8
I	D	4
J	g, h	11
K	E	5
L	I	7

Number the events by Fulkerson's rule and find the critical path. Also find the time for completing the project.

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11. What is Monte Carlo simulation ? Explain how simulation is useful in solving queuing and inventory problems.

12. Determine an initial basic feasible solution for the following TP, using the least cost method.

	D_1	D_2	D_3	D_4	Supply
O_1	6	4	1	5	14
O_2	8	9	2	7	16
O_3	4	3	6	2	5
Demand	6	10	15	4	35