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12026

MBA 2 Yr. 2nd Semester CBCS (2016-17) Examination – May, 2019

OPERATION RESEARCH

Paper : 16IMG22C6

Time : Three Hours] *[Maximum Marks : 80*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Section – A is ***compulsory***. Attempt ***one*** question from each Unit in **Section – B**. All questions carry equal marks.

SECTION – A

1. (a) What is Operations Research ?

(b) Why is simulation used ?

(c) Differentiate between PERT and CPM.

(d) What is objective of Travelling Salesman Problem ?

(e) What is simulation ?

(f) What critical activities in PERT denotes ?

(g) What is time-cost trade off in PERT ?

(h) What is a decision tree ?

SECTION – B

UNIT – I

2. (a) Why one should study Operations Research ? Discuss the nature and scope of Operations Research.

(b) A firm manufactures two products A and B on which the profits earned per unit are Rs. 3 and Rs. 4 respectively. Each product is processed on two machines M1 and M2. Product A requires one minute of processing time on M1 and two minutes on M2 while B requires one minute on M1 and one minute on M2. Machine M1 is available for not more than 7 hours and while Machine M2 is available for 10 hours during any working day. Find the number of units of products A and B to be manufactured to get maximum profit. (Use graphical method).

3. Use simplex method to solve the following LPP :

Maximize $Z = 4x_1 + 10x_2$

Subject to the constraints :

$$2x_1 + x_2 \leq 50$$
$$2x_1 + 5x_2 \leq 100$$
$$2x_1 + 3x_3 \leq 90 ; x_1 \ \& \ x_2 \geq 0$$

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UNIT – II

4. Solve the following assignment problem :

		Jobs			
		A	B	C	D
	I	1	4	6	3
Workers	II	9	7	10	9
	III	4	5	11	7
	IV	8	7	8	5

5. The following is the initial basic feasible solution to a transportation problem. Find the optimal solution for the same.

						Supply
	20	15 18	85 18	21	19	100
	21	20 22	23	105 20	24	125
	60 18	45 19	21	18	70 19	175
Demand	**60**	**80**	**85**	**105**	**70**	

UNIT – III

6. A project consists of nine activities and the details about them are given below in the table 1. Draw the project network number the events identify critical path and determine duration of this project.

Table – 1

Activity	A	B	C	D	E	F	G	H	1 (Last)
Duration in weeks	8	6	3	7	5	6	3	10	5
Predecessor(s)	–	A	B	C	D	B	B	G	EFH

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7. (a) A PERT network consists of seven activities. The optimistic time (t_o) most likely (t_m) and pessimistic time (t_p) as estimated for different activities in weeks are given below in table 2.

Table – 2

Activity/Time	1-2	1-3	1-4	2-5	3-5	4-6	5-6
(t_o)	1	1	2	1	2	2	3
(t_m)	1	4	2	1	5	5	6
(t_p)	7	7	8	1	14	8	15

(b) Draw the network. Determine critical path and standard deviation of project. What is the probability of completing the project weeks earlier than the expected time.

UNIT – IV

8. A two person zero-sum game is represented by the following pay-off matrix for Player - A.

	I	II	III
I	5	2	3
II	3	5	4

(i) Verify that there is no stable solution to this game.

(ii) Find the best strategy for Player - A and the value of the game to her.

9. Obtain the optimal strategies for both persons and the value of the game for zero-sum two-person game whose payoff matrix is given below :

3	2	4	0
2	4	4	2
4	2	4	0
0	4	0	8

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