

QP Code:109380

First Year MHA Degree Examinations, December 2012  
 PAPER VI - OPERATIONS RESEARCH

Time: 3 Hours

Max Marks: 100

- Answer all the questions
- Draw diagrams wherever necessary

Essays:

(2x20=40)

1. Solve the L.P.P by Simplex Method:

Maximise  $Z = 7x_1 + 5x_2$

Subject to  $x_1 + 2x_2 \leq 6$

$4x_1 + 3x_2 \leq 12$

$x_1, x_2 \geq 0$

2. From the following data, draw the project network . Find out the critical path and project duration. What is the probability of completing the project one week before the expected time?

Activity	1-2	1-3	1-5	2-3	2-4	3-5	3-6	5-6	4-6
Optimistic time	2	6	6	2	11	8	3	9	4
Most likely time	4	6	12	5	14	10	6	15	10
Pessimistic time	6	6	24	8	23	12	9	27	16

Short Essays:

(2x10=20)

3. Discuss the costs associated with queuing system and also explain the concept of optimum servicing rate and optimum cost.

4. A tourist car operator finds that during the past 100 days the demand for the car had been varied as shown below.

Trips per week :    0     1     2     3     4     5

No. of days         8     12    15    30    20    15

Using random numbers simulate the demand for a 10 week period.

(Use the random numbers 09, 54, 42, 01, 80, 06, 26, 57, 79, 52)

- Short notes:

(8x5=40)

5. Define PERT & CPM and mention two of its applications.
6. Write the dual of the following LPP:-

$$\begin{aligned} \text{Maximize } Z &: 3x_1 + 5x_2 \\ \text{Subject to } &: x_1 + 2x_2 \leq 5 \\ &: -x_1 + 2x_2 \leq 2 \\ &: X_1 \geq 0, x_2 \geq 0. \end{aligned}$$

7. Find the initial feasible solution to the following transportation problem by lowest entry method.

	W 1	W 2	W 3	Supply
F1	2	7	4	5
F2	3	3	1	8
F3	5	4	7	7
F4	1	6	2	14
Demand	7	9	18	

8. In an assignment problem for a manager, there are 12 workers and 12 jobs to be done. Only one man can work in any one job. What is the total number of different possible ways of assignment of the jobs to the workers.
9. List out the various steps involved in the Modi distribution method for solving a given transportation problem.
10. Mathematical models and their importance in decision making.
11. Game theory and its uses.
12. Solve the following game:-

		Player B			
		B1	B2	B3	B4
Player A	A1	1	7	3	4
	A2	5	6	4	5
	A3	7	2	0	3

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