

[Dec-16]

[MPDOM-315]
MBA Degree Examination

Operations Management
III SEMESTER

OPERATIONS RESEARCH

(Effective from the admitted batch 2009-10)

Time: 3 Hours

Max.Marks: 70

Instructions: All parts of the unit must be answered in one place only.
Figures in the right hand margin indicate marks allotted.

SECTION-A

1. Answer any Five of the following: (5×4=20)

- Write about scope of OR
- What is 'Unbounded Solution' in LPP. Give an example graphically
- Write the dual form of the following information :-

$$\text{Maximize } Z = 2x_1 + 9x_2 + 4x_3$$

Subject to

$$2x_1 + 4x_2 + x_3 \leq 5$$

$$3x_1 + x_2 + 2x_3 \leq 4$$

$$x_1, x_2, x_3 \geq 0$$

d) Solve the following Assignment problem

Job	Men		
	A	B	C
1	120	100	80
2	80	90	110
3	110	140	120

- What are the managerial uses of dynamic programming?
- What do you mean by ABC analysis? Explain
- What is meant by Queueing model? State its characteristics
- What is Saddle point? Give an example

SECTION-B

Answer all questions:

(5×10=50)

2. a) Explain different models used in OR in solving managerial problems

OR

- b) Discuss the relevance of probability and statistics in decision making?

3. a) Solve the following LPP :-

$$\text{Maximize } Z = 45x_1 + 55x_2$$

$$x_1 + x_2 \leq 30$$

$$2x_1 + 3x_2 \leq 80$$

Subject to :

$$x_1 - x_2 \geq 8$$

$$x_1, x_2 \geq 0$$

OR

- b) Find the optimum solution of the following Transportation Problem

	D ₁	D ₂	D ₃	D ₄	Supply
O ₁	1	2	1	4	30
O ₂	3	3	2	1	50
O ₃	4	2	5	9	20
Demand	20	40	30	10	

4. a) Solve the following LPP by Dynamic Programming :

$$\text{Maximize } Z = 8x_1 + 7x_2$$

$$\text{Subject to } 2x_1 + x_2 \leq 8$$

$$5x_1 + 2x_2 \leq 5$$

$$x_1, x_2 \geq 0$$

OR

- b) What is Integer programming? Explain the steps involved in cutting plane method of solving an Integer programming problem

5. a) The annual demand of DD stationary in bank branch of Geetham University is 3200 leaflets. The cost per leaflet is Rs.6 and inventory carrying charges are 20% per annum. The cost per procurement is Rs.150. What is EOQ. If the annual demand for DD stationary has increased by 800 leaflets and the cost per leaflet is reduced by Rs.1. What is new EOQ. Analyse and suggest which of the two options is optimal and why?

OR

- b) In a service department manned by one server, one customer arrives on an average every 10 minutes. It has been found out that each customer requires 6 minutes to be served. Find out
- Average Queue length
 - Average time spent in the system
 - Average waiting time in the Queue
 - Probability of being busy

6. a) Find the best strategy and the value of the following game:

		Player B				
		B ₁	B ₂	B ₃	B ₄	B ₅
Player A	A ₁	8	10	-3	-8	-12
	A ₂	3	6	0	6	12
	A ₃	7	5	-2	-8	17
	A ₄	-11	12	10	10	20
	A ₅	-7	0	0	6	2

OR

- b) The daily demand for 'Operation Research' book written by a famous author in a bookstall is probabilistic and replenishment of stock takes 4 days. The probable demand for OR books are :

Daily demand	1	2	3	4	5	6	7	8	9	10
Probability	0.10	0.12	0.13	0.17	0.18	0.10	0.08	0.07	0.05	0.05

Use the following random numbers and stimulate the demand for 17 days.

Random Numbers :

3, 38, 17, 32, 69, 61, 30, 02, 48, 88, 71, 27, 80, 33, 96, 78, 55

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