Code No: 762AD **R19**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

MBA II Semester Examinations, February/March - 2024

QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS

Time: 3 Hours **Max.Marks:75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART - A

(25 Marks)

1.a) Describe the applications of OR in different areas. [5]
b) Illustrate the guidelines for formulation of LPP. [5]
c) Discuss the vogels approximation method with an example. [5]
d) Examine the ingredients of decision problems. [5]
e) Describe the Queuing structure and component of a Queuing model. [5]

PART - B

(50 Marks)

2.a) Discuss the qualitative techniques of decision making in OR.
b) Explain the short comings of using OR models. [5+5]

OR

3.a) Discuss the scope of operations research.
b) Write any two applications of operations research in management. [5+5]

4.a) Describe simplex method of solving linear programming problems.
b) Apply graphical method of solving the following LPP and find the optimal solution:
Maximize $Z = 8x_1 + 5x_2$
Subject to
$2x_1 + x_2 \leq 500$,
$x_1 \leq 150$
$x_2 \leq 250$
$x_1 \geq 0, x_2 \geq 0$ [5+5]

OR

5.a) Explain lowest cost entry method for obtaining an initial basic solution of a transportation problem.
b) Calculate the initial basic feasible solution of the following Transportation problem using Vogel's approximation method. [5+5]

	Stores				Availability
	I	II	III	IV	
A	21	16	15	13	11
B	17	18	14	23	13
C	32	27	18	41	19
Warehouse Requirement	6	10	12	15	

6.a) Define assignment problem. Formulate as Assignment problem as a linear programming problem.

b) A car hire company has one car at each of five depots a, b, c, d and e. A customer requires a car in each town namely A, B, C, D and E. Distance (kms) between depots (origins) and towns (destinations) are given in the following distance matrix. [5+5]

	a	b	c	d	e
A	160	130	175	190	200
B	135	120	130	160	175
C	140	110	155	170	185
D	50	50	80	80	110
E	55	35	70	80	105

How should the cars be assigned to the customers, so as to minimize the distance travelled?

OR

7.a) What is a traveling salesman problem? Write its applications.

b) Solve the following travelling salesmen problem. [5+5]

	A	B	C	D
A	∞	46	16	40
B	41	∞	50	40
C	82	32	∞	60
D	40	40	36	∞

8.a) A shop keeper has the facility to store a large number of perishable items. He buys them at a rate of Rs.3 per item and sells at the rate of Rs.5 per item. If an item is not sold at the end of the day then there is a loss of Rs.3 per item. The daily demand has the following probability distribution.

Number of Items demanded	:	3	4	5	6
Probability	:	0.2	0.3	0.3	0.2

How many items should he stored so that his daily expected profit is maximum?

b) Define PERT and CPM. Write the differences between PERT and CPM. [5+5]

OR

9. From the following information about a project

Activity	Optimistic Time	Most likely Time-weeks	Pesimistic Time-week
1-2	2	3	7
1-3	3	4	8
2-5	4	3	10
3-4	2	2	7
4-6	3	2	3
4-7	3	4	6
6-7	4	5	10

a) Draw the project network.

b) Find the expected duration and variance of each activity.

c) Determine the critical path. [4+3+3]

10.a) Explain the basic characteristics of a queue system.

b) Solve the following game and find the optimal strategies. [5+5]

		Player B				
		I	II	III	IV	V
Player A	I	-2	0	0	5	3
	II	3	2	1	2	2
	III	-4	-3	0	-2	6
	IV	5	3	-4	2	-6

OR

11.a) Brief on distributions in queuing model.

b) Describe the game theory and suddle point in brief. [5+5]

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