Hall Ticket No: | | | | | | | | | | | Course Code: 18MBAP114

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MBA II Year I Semester (R18) Supplementary End Semester Examinations – August 2022

OPERATIONS RESEARCH

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part A or Part B only. Q.no 6 which is a case study is compulsory.

		Marks	CO	BL
Q.1(A)	Define OR. Explain the scope of Operations Research.	10M	1	2
	OR			
Q.1(B)	Solve the L.P.P. by Simplex method: $Max.Z = 5x_1 + 3x_2$ Subject to $x_1 + x_2 \le 2$, $5x_1 + 2x_2 \le 10$, $3x_1 + 8x_2 \le 12$, $x_1, x_2 \ge 0$	10M	1	3
Q.2(A)	Determine the optimum transportation cost for the following Transportation problem:	10M	2	5

	D1	D2	D3	D4	Availability
P1	1	2	1	4	30
P2	3	3	2	1	50
P3	4	2	5	9	20
Requirement	20	40	30	10	

OR

Q.2(B)	Solve the following assignment problem:					10M	2	3

	I	II	III	IV	V
A	3	8	2	10	3
B	8	7	2	9	7
C	6	4	2	7	5
D	8	4	2	3	5
E	9	10	6	9	10

Q.3(A)	Explain the terms i) Two-Person zero-sum games ii) Pay-off matrix iii) Minimax-Maximin principle and iv) Saddle point and value of the game.					10M	3	2
	OR							
Q.3(B)	Evaluate the optimal strategies of player A & B and Determine value of the game by using dominance property.					10M	3	5

		Player B			
		B1	B2	B3	B4
Player A	A1	3	2	4	0
	A2	3	4	2	4
	A3	4	2	4	0
	A4	0	4	0	8

Q.4(A) A firm is considering replacement of a machine, whose cost price is Rs.6100, and the scrap value Rs.100. The running costs in Rs are found from experience to be as follows: 10M 4 5

Year	1	2	3	4	5	6	7	8
Running cost	100	250	400	600	900	1250	1600	2000

Determine the optimum period for replacement of the machine.

OR

Q.4(B) a) Explain the types of simulation models and merits & demerits of simulation. 10M 4 3

b) Discuss monte-carlo simulation process.

Q.5(A) Discuss the components of Queuing Theory with examples. 10M 5 2

OR

Q.5(B) The following table gives the activities of construction project and duration: 10M 5 5

Activity	1-2	1-3	2-3	2-4	3-4	4-5
Duration (days)	20	25	10	12	5	10

Draw the network for the project. Determine the critical path and project duration.

Q.6 **Case Study** 10M 4 5

A bakery keeps stock of popular brand of bread. Previous experience indicates the daily demand as given below:

Daily demand: 0 10 20 30 40 50

Probability: 0.01 0.20 0.15 0.50 0.12 0.02

Consider the following sequence of random numbers:

48, 78,19,51,56,77,15,14,68,8

Using above sequence, simulate the demand for the next 10 days.

(i). Find out the stock situation if the owner of the bakery decides to make 30 breads every day.

(ii). Estimate the daily average demand for the bread on the basis of simula data.

END