Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third trimester MBA examinations (S), October 2020

Course Code: 36

Course Name: OPERATIONS RESEARCH

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions. Each question carries 2 marks Marks

1 Distinguish between a Queue and a Queuing system 2

2 "OR helps in scientific decision making". Elaborate 2

3 Illustrate the Decision Tree method 2

4 Explain the North West Corner Rule in solving Transportation problems 2

5 What is Saddle point in a Game theory? 2

PART B

Answer any 3 questions. Each question carries 10 marks

6 Formulate a Linear Programming model for maximising Profits, from the following data. 10

An Industry is manufacturing two products P1 and P2. Profits from the products are Rs. 30 and Rs. 40 respectively. The products require three machines M1, M2, M3 for production and the time required for each product on each machine, as well as total available time(in hours) for the machines is given below.

Profits	Product 1 Rs. 30	Product 2 Rs. 40	Total time available
Machine 1	3	2	600
Machine 2	3	5	800
Machine 3	5	6	1100

7 Draw the PERT network diagram from the following data and find the Critical path duration. 10

Activity	1-2	1-6	2-3	2-4	3-5	4-5	6-7	5-8	7-8
Optimistic time	1	2	2	2	7	5	5	3	8
Most likely time	7	5	14	5	10	5	8	3	17
Pessimistic time	3	14	26	8	19	17	29	9	32

8 A company has 3 supply sources and 3 distribution locations. Transportation costs between sources and destinations are given below. Find an initial feasible solution for allocation. 10

Sources	Destinations			
	D1	D2	D3	Supply
S1	4	3	8	300
S2	7	5	9	300
S3	4	5	5	100
Demand	200	200	300	

9 a. Distinguish between Decision making under Uncertainty and decision making under Risk. 4

b. Decision alternatives, Possible states of nature and pay off for a company is given below. Which decision alternative you will choose using Maximax, Maximin and Laplace methods? 6

Decision alternatives	States of nature		
	N1	N2	N3
S1	7	3	1.5
S2	5	4.5	0
S3	3	3	3

10 a. Describe any three Queue disciplines 3

b. With respect to Game theory, explain 2 person Zero sum Game, Saddle point, Value of the game, and strictly determinable game. 7

PART C

Compulsory question carrying 20 marks

11 a. In a service centre, customer arrivals follow a Poisson distribution and Service time follows an exponential distribution. Mean arrival interval is 20 minutes and service takes 15 minutes. Find the idle time percentage, number of customers in the service centre, waiting time in the queue and probability of having 2 customers in the queue. 8

b. Solve the game whose pay off matrix is given below. 12

Player A	Player B		
	B1	B2	B3
A1	4	5	8
A2	6	4	6
A3	4	2	4

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