Name:
Enrolment No:

UPES
UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM & ENERGY STUDIES

Online End Semester Examination – Dec, 2020

Course: Supply Chain Modeling, Design and Simulation — **Semester: III**
Subject/: MBA LSCM — **Time: 3 Hours**
Course Code: LSCM8006 — **Max. Marks: 100**

SECTION A

1. Each Question will carry 5 Marks
2. Instruction: Complete the statement / Select the correct answer(s)

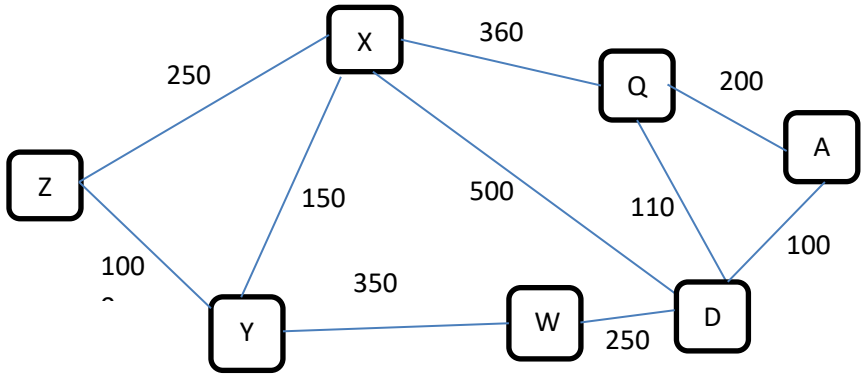
S.No.	Question	COs
Q 1	_____ problems have applications in communication networks while _____ problems are used for network of pipelines.	CO1
Q 2	The types of models discussed using AMPL are _____, _____ and _____.	CO1
Q 3	Select all the correct statements a. Aggregate planning is type of dynamic programming b. Three jug puzzle is type of shortest route algorithm c. Length of a system in single server model is equal to length of queue + 1 d. AMPL is used for solving Linear programming problems	CO1
Q 4	The Kendall's Notation comprise of _____, _____, _____, _____, _____ and _____.	CO3
Q 5	The two approaches for time advance in simulation are _____ and _____. The elements of discrete event simulation are _____, _____ and _____.	CO4
Q 6	_____ property is used to reduce the size of game theoretic problem. _____ point is reached if payoff matrix reduces to single strategy.	CO4

SECTION B

1. Each question will carry 10 marks
2. Instruction: Solve the numerical problems

Q 7	Solve the following stage coach problem using Dynamic Programming. There are 6 nodes and the arcs and distances (in brackets) are given: 1-2(8), 1-3(10), 2-4(7), 2-5(9), 3-4(4), 3-5(5), 4-6(12), 5-6(8)	CO2
Q 8	There are two items with the data given below. The restriction on total number of orders is 18. Find the EOQ value for individual items and total cost.	CO2

	Item 1	Item 2
Annual Demand	10000	20000

<table>
<tr><td></td><td>
<table>
<tr><td>Order Cost</td><td>300</td><td>300</td></tr>
<tr><td>Unit Price</td><td>20</td><td>25</td></tr>
<tr><td>Interest Rate</td><td>20%</td><td>25%</td></tr>
</table>
</td><td></td></tr>
<tr><td>Q 9</td><td>Consider a two person zero sum game with the data given below. Player A has three strategies and player B has three strategies. Solve the problem to get steady state payoff
<table>
<tr><td>4</td><td>3</td><td>-2</td></tr>
<tr><td>-1</td><td>4</td><td>2</td></tr>
<tr><td>1</td><td>-2</td><td>-4</td></tr>
</table>
</td><td>CO4</td></tr>
<tr><td>Q 10</td><td>Use the Floyd’s Algorithm to find the shortest distance from depot Z to depot A


</td><td>CO2</td></tr>
<tr><td>Q 11</td><td>Cranberry Ltd has an arrival rate of delivery vans of 24 vans during an eight-hour day while an average of five vans can be loaded during an hour. Find the following:
a) Utilization factor,
b) Average number of customers in the system
c) Average queuing time?</td><td>CO3</td></tr>
<tr><td colspan="3">Section C
1. Each Question carries 20 Marks.
2. Instruction: Solve any one case study</td></tr>
<tr><td>Q 12</td><td>An outdoors person who lives in New Delhi (ND) wishes to spend a 15-day vacation visiting four national parks:Rajaji (RJ), Jim Corbett (JC), Khirganga (KG), and Gir Forest (GF). The tour, which starts and ends in New Delhi, visits the parks in the order ND->RJ->JC->KG->GF->ND and includes a 2-day stay at each park. Travel from one park location to another is either by air or car. Each leg of the trip takes 1/2 day if traveled by air. Travel by car takes 1/2 day from ND to RJ, 3 days from RJ to JC, one day from JC to KG, 2 days from KG to GF, and 3 days from GF back to ND. The tradeoff is that car travel generally costs less but takes longer. Considering that the individual must return to work in 15 days, the objective is to make the tour as inexpensively as possible within the 15-day limit. Table below provides the one-way cost of traveling by car and air. Determine the mode of travel on each leg of the tour.</td><td>CO4</td></tr>
</table>

	Air travel cost($) to					Car travel cost($) to				
From	ND	RJ	JC	KG	GF	ND	RJ	JC	KG	GF
ND	-	150	350	380	450	-	130	175	200	230
RJ	150	-	400	290	340	130	-	200	145	180
JC	350	400	-	150	320	175	200	-	70	150
KG	380	290	150	-	300	200	145	70	-	100
GF	450	340	320	300	-	230	180	150	100	-

OR

A commuter airline prides itself on customer service, with features such as providing its morning passengers with a copy of "The Wall Street Journal". The paper costs $ 1.50 per issue. The newsstand price is $ 2.50. The salvage value of the newspaper is $0.50. What size subscription should be ordered if a small plane with only six seats have experienced the demand distribution below:

Passengers	2	3	4	5	6
Probability	0.1	0.2	0.2	0.3	0.2