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MBA
MGT 103

FIRST SEMESTER EXAMINATION, 2015

QUANTITATIVE TECHNIQUES

BRANCH : MBA

QUESTION CODE : T821

Max marks: 70

Time: 3 Hours

Answer Question No.1 which is compulsory and any five from the rest.
[The figures in the right hand margin indicate marks]

Q.1 Answer the following : **2x10**

(a) If mean arrival time = 20 Customers per hour and mean service time = 30 Customers per hour, then average waiting time of a Customer in the system is ___________

(b) An initial feasible solution with (m+n-1) number of variables xij, i = 1,2, ….., m, j = 1,2, ….., n, is called a ___________solution.

(c) If in a game the payments are made from and among the players only then the game is known as ___________ game.

(d) If the value of the game is not zero, then the game is called ___________ game.

(e) Study stock market price movements is an application of __________ technique.

(f) Traffic light-timing is an application of __________ technique.

(g) The outcome of any action depends on certain factors which are often uncontrollable. These factors are called __________

(h) An event which takes place after the completion of two or activities at a time is ________

(i) If earliest starting time = 20 days and latest starting time = 25 days and head slack = 3 days, then find free float.

(j) If optimistic time = 7 days and pessimistic time = 3 days, of an activity, then find variance of that activity.

Q.2 Solve by using dominance property the game : **10**

		Player 'B'	
	I	**II**	**III**
Player 'A' 1	1	7	2
2	6	2	7
3	6	1	6

Q.3 The number of units of an item that are withdrawn from inventory on a day-to-day basis follows a Markov Chain Process, in which requirements for tomorrow depend on today's requirement. **10**

A one-day transition matrix is given below :

		Tomorrow	
	5	**10**	**12**
Today 5	0.6	0.4	0.0
10	0.3	0.3	0.4
12	0.1	0.3	0.6

(a) Develop a two-day transition matrix.
(b) Construct tree diagram of one-day transition matrix.
(c) Comment that if 5 units of items are withdrawn from inventory today,then what is probability that 5 units, 10 units and 12 units will be withdrawn from inventory day after tomorrow.

Q.4 A bakery keeps stock of a popular brand of cake. Previous experience shows the daily demand for the item with associated probabilities, as given below : **10**

Daily demand (Nos.)	0	10	20	30	40	50
Probability	0.01	0.20	0.15	0.50	0.12	0.02

Use the following sequence of random numbers to simulate the demand for next 10 days : Random numbers : 25,39, 66, 76, 12, 05, 73, 89, 19, 49.

Also estimate the daily average demand for the cakes on the basis of simulated data.

Q.5 A marketing manager has five salesmen and five sales districts. Considering the capabilities of the salesmen and nature of districts, the marketing manager estimates that sales per month (in thousand rupees) for each salesman in each district would be as follows : **10**

Salesmen	Districts				
	A	B	C	D	E
1	32	38	40	28	40
2	40	24	28	21	36
3	41	27	33	30	37
4	22	38	41	36	36
5	29	33	40	35	39

Find the assignment of salesmen to districts that will result in maximum sales.

Q.6 From the data given below, find out the following : **10**

a) Critical path and non-critical paths through a Network diagram.

b) Slacks of the events.

c) Different slacks of the activities.

d) Different floats of the activities

Activity	1→2	1 → 3	2 → 3	2 → 4	3 → 4	4 → 5
Estimated time (days)	20	25	10	12	6	10

Q.7 Make a graphical representation of the set of constraints in the following LPP. **10**

Maximize $Z = 2x + y$

subject to

$4x + 3y \leq 12$

$4x + y \leq 8$

$4x - y \leq 8$

$x \geq 0, y \geq 0$

Q.8 Given is the following pay-off matrix : **10**

	Decision			
	Probability	Do not expand	Expand 200 units	Expand 400 units
High demand	0.4	Rs.2,500	Rs.3,500	Rs.5,000
Medium demand	0.4	Rs.2,500	Rs.3,500	Rs.2,500
Low demand	0.2	Rs.2,500	Rs.1,500	Rs.1,000

What should be the decision if we use

(I) EMV Criterion
(ii) The minimax criterion
(iii) The maximax criterion.

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