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Code No: MA203

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
MBA - II Semester Examinations, February 2011
QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS

Time: 3hours **Max. Marks: 60**

Answer any five questions
All questions carry equal marks

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1. a) What is the nature of problems?
   b) What are the typical applications of dynamic programming?

2. A modern home appliances dealer finds that the cost of holding a mini cooking range in stock for a month is Rs 400/- (insurance, Minor deterioration, interest on borrowed capital etc.) Customers who cannot obtain a cooking range immediately tend to go other dealers and he estimates that for every customer who cannot get immediately delivery he loses an average of Rs 1000. The probabilities of demand of 0, 1, 2, 3, 4, 5 mini cooking ranges in a month are 0.05, 0.1, 0.2, 0.3, 0.2 and 0.15 respectively. Determine the optimal stock level of cooking ranges. Also find EVPl.

3. A manufacturing of leather belts makes three types of belts A, B and C which are processed on 3 machines M_1, M_2, and M_3. Belt A requires 2 hrs on machine M_1 and 3 hrs. on machine M_2 and 2 hrs. on machine M_3. Belt B requires 3 hrs on Machine M_1, 2hrs on machine M_2 and 2 2hrs. on machine M_3. Belt C requires 5 hrs. on machine M_2 and 4 hrs. on machine M_3. There are 8 hrs. of time per day available on machine M_1, 10 hrs. of time available in machine M_2 and 15 hrs. of time per day available on machine M_3. The profit gained from belt A is Rs3 per unit, from belt B is Rs.5 per unit and from belt C is Rs 4 per unit. What should be the daily production of each type of belt so that the profit is maximum.

4. Player A is paid if two coin turns both heads and Rs10 if two coins turn both tails. Player B is paid Rs 3 when two coins do not match. Formulate this into two people zero sum game; find the strategy for A and B and value of the game.

5. A repair shop attended by a single mechanic has an average of four customers an hour who bring small appliances for repair. The mechanic inspects them for defects and takes six minutes on an average. Arrivals are Poisson and service rate has the exponential distribution you are required to

   i) Find the proportion of time during which there is no customer in the shop.
   ii) Find the probability of finding at least one customer in the shop.
   iii) What is the average number of customers in the system?
   iv) Find the average time spent by a customer in the shop including service.

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6. Define Simulation. Explain the basic steps of Monte Carlo Simulation. Give specific applications of simulation.

7. A management student identities the following List of activities and sequencing requirements along with the time estimates for various activities related to the completion of his project work.

Activity	Description	immediate Predecessor	Activity Time (days) Optimistic	Likely	Pessimistic
A	Search for List	-	3	6	9
B	Dedicating the project	-	2	6	12
C	Preliminary work	B	1	1.5	5
D	Formal proposal	C	1	2	3
E	Project Committees approval	A, D	1.5	2	4.5
F	Progress Report	E	0.5	1	1.5
G	Format Research	A, D	4.5	5	11.5
H	Data collection	E	2	5	8
I	Analysis	G, H	4	5.5	10
J	Conclusion	I	1.5	2.5	4.5
K	Draft	I,F	2	3.5	8
L	Final draft	J, K	2.5	3	1.5
M	Presentation	L	0.5	1	1.5

With the help of an arrow diagram, determine the minimum time required to complete the project. From the network, identity the activities which can be delayed without affecting the project duration and the extent of delay that is possible for each activities.

8. Write short notes on any three
   i) Group replacement
   ii) Traveling salesman problem
   iii) Hungarian method of solving assignment problem
   iv) Duality in linear programming.

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