

Code No: 25

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

MBA-II Semester Regular Examinations July 2010

QUANTITATIVE ANALYSIS BUSINESS DECISIONS

Time: 3hours

Max.Marks:60

**Answer any Five questions**  
**All questions carry equal Marks**

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1. The Tit-Fit Scientific Laboratories is engaged in producing different types of high class equipment for use in science laboratories. The company has two different assembly lines to produce its most popular product 'Pressurex'. The processing time for each of the assembly lines is regarded as a random variable and is described by the following distributions.

Process Time (Minutes)	Assembly A1	Assembly A2
10	0.10	0.20
11	0.15	0.40
12	0.40	0.20
13	0.25	0.15
14	0.10	0.05

Using the following random numbers, generate data on the process times for 15 units of the item and compute the expected process time for the product. For the purpose, read the numbers vertically taking the first two digits for the processing time on assembly A1 and the last two digits for processing time on assembly A2.

4134	8343	3602	7505	7428
7476	1183	9445	0089	3424
4943	1915	5415	0880	9309

2. What is Simulation? Describe the Simulation Process. State the major reasons for using Simulation to solve a business problem. What are the advantages and disadvantages of Simulation?
3. A company is currently involved in negotiations with its union on the upcoming wage contract. With the aid of an outside mediator, the table below was constructed by the management group. The pluses are to be interpreted as proposed wage increases while a minus figure indicates that a wage reduction is proposed. The mediator informs the management group that he has been in touch with the union and that they have constructed a table that is comparable to the table developed by the management. Both the company and the union must decide on an overall strategy before negotiations being made. The management group understands the relationship of company strategies to union strategies in the following table but lacks specific knowledge of game theory to select the best strategy (or strategies) for the firm. Assist the management on this problem. What game value and strategies are available to the opposing groups?

Cont..2

<u>Conditional Costs to Company (In Rupees)</u>				
Company Strategies	Union Strategies			
	U1	U2	U3	U4
C1	+0.25	+0.27	+0.35	-0.02
C2	+0.20	+0.16	+0.08	+0.08
C3	+0.14	+0.12	+0.15	+0.13
C4	+0.30	+0.14	+0.19	0.00

4. Explain and illustrate the following principles of decision making.
- Laplace
  - Maximin
  - Maximax
  - Hurwicz
  - Savage and
  - Expectation.
5. Describe a single server waiting line model. Give an example from real life, for each of the following queuing models.
- First-come-first-served
  - Last-come-first-served
  - Random Pick Service
  - Customers stay only if served instantly.

6. The data on the operating costs per year and resale prices of equipment A whose purchase price is Rs.10000 are given here:

Year:	1	2	3	4	5	6	7
Operating Cost (Rs)	1500	1900	2300	2900	3600	4500	5500
Resale Value (Rs)	5000	2500	1250	600	400	400	400

- What is the optimum period for replacement?
  - When equipment A is 2 years old, equipment B, which is new model for the same usage, is available. The optimum period for replacement is 4 years with an average cost of Rs.3600. Should we change equipment A with that of B? If so when?
- 7.a) Discuss the similarities in the solution procedures for transportation and assignment models.
- Explain the Hungarian Assignment Method. Is it better than other methods of solving assignment problem? How?
- 8.a) Discuss the role and scope of quantitative methods for scientific decision-making in business management.
- Discuss and describe the role of linear programming in managerial decision-making bringing out limitations, if any.