JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
MBA II Semester Examinations, October/November - 2022
QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS

Time: 3 Hours   **Max.Marks:75**

Answer any five questions
All questions carry equal marks
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1.a) Discuss the scope of operation research in the modern era of business.
  b) How can a business manager overcome the shortcoming of OR applications?   [7+8]

2.a) "The purpose of operations research is to achieve the best performance under the given circumstances." Comment.
  b) "The field of operations research provides a more powerful approach to decision-making than ordinary software and data analytics tools." Elucidate the statement.   [7+8]

3.a) A firm produces three products. These products are processed on three different machines. The time required to manufacture one unit of each of the three products and the daily capacity of the three machines are given in the table below:

Machine	Time per unit			Machine Capacity (minutes/day)
	Product 1	Product 2	Product 3	
M_1	2	3	2	440
M_2	4	-	3	470
M_3	2	5	-	430

It is required to determine the daily number of units to be manufactured for each product. The profit per unit for products 1, 2 and 3 is Rs. 4, Rs.3 and Rs.6 respectively. It is assumed that all the amounts produced are consumed in the market. Formulate the mathematical (L.P.) model that will maximize the daily profit.
  b) Discuss the basic assumptions of LPP.   [9+6]

4.a) What are the limitations of LPP?
  b) Star Limited produces two types of ACs, one of which is black and white, the other color. The company has the resources to make at most 200 sets a week. Creating a black and white set includes Rs 2700 and Rs 3600 to create a colored set. The business should spend no more than Rs 648000 a week producing AC sets. If it benefits from Rs 525 per set of black and white and Rs 675 per set of colors, how many sets of black/white and colored sets it should produce in order to get maximum profit? Formulate this using LPP.   [6+9]

5.a) What are the objectives of the assignment?
  b) Determine the minimum combination on each row and column of the Table below using the Hungarian method. [7+8]

Row	Column					
	A	B	C	D	E	F
1	7	5	8	2	3	6
2	2	1	7	5	3	2
3	4	5	6	2	5	4
4	10	6	5	4	8	3
5	7	6	5	5	4	4

6.a) "The transportation model is concerned with selecting the routes between supply and demand points in order to minimize the costs of transportation." Elaborate on this statement.
  b) Use the simplex method to find an improved solution for the linear programming problem represented by the following tableau. [7+8]

X	X	S	S	S	b	Basic Variable
-1	1	1	0	0	11	S_1
1	1	0	1	0	27	S_2
2	5	0	0	1	90	S_3

7.a) Write short notes on the "construction of decision tree."
  b) Differentiate between CPM and PERT. [7+8]

8.a) What is "Game theory"?
  b) A repairman repairs the sets in the order in which they arrive and expects that the time required to repair a set has an ED with mean 30mins. The sets arrive in a Poisson fashion at an average rate of 10/8 hrs. a day.
  (i) What is the expected idle time/day for the repairman?
  (ii) How many TV sets will be there awaiting repair? [6+9]

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