Register No.: ……………………… Name.: ……………………………………………………

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER MBA DEGREE EXAMINATION (S), SEPT 2022
(2020 Scheme)

Course Code: **20MBA110**

Course Name: **Operations Research**

Max. Marks: **60**   **Duration: 3 Hours**

PART A

(Answer all questions. Each question carries 2 marks)

1. State any two importance of OR in Managerial Decision making.

2. Mention the methods to find the initial solution of transportation problem.

3. What is decision tree?

4. Brief on the various costs associated with inventory.

5. Differentiate PERT and CPM

PART B

(Answer any 3 questions. Each question carries 10 marks)

6. The number of man hours available per week at the machine centers I and II are 60 and 48 respectively. Product A requires 4 and 2 man hours and product B requires 2 and 4 man hours at the machine centers I and II respectively per product. The profit per product of A is Rs.8 and product B is Rs.6. Using graphical method, find the optimum production for maximum profit.

7. Solve the following transportation problem to maximize profit.

	D_1	D_2	D_3	D_4	Supply
A	40	25	22	33	100
B	44	35	30	30	30
C	38	38	28	30	70
Demands	40	20	60	80	200

8. Dr.Thomas has been thinking about starting his own independent nursing home. The problem is to decide how large the nursing home should be. The annual returns will depend on both the size of nursing home and a number of marketing factors. After a careful analysis, Dr.Thomas developed the following table:

Size of Nursing Home	Good Market (Rs.)	Fair Market (Rs.)	Poor Market (Rs.)
Small (S)	50,000	20,000	-10,000
Medium (M)	70,000	35,000	-25,000
Large (L)	90,000	35,000	-45,000
Very Large (VL)	2.00.000	25,000	-1,20,000

(a) What is the maximax decision?   (2Marks)

(b) What is maximin decision?   (2 Marks)

(c) What is equally likely decision?   (2 Marks)

(d) What is criterion of realism decision? Use alpha = 0.8   (2 Marks)

(e) Develop an opportunity loss table and determine the minimax decision   (2 Marks)

9. A manufacturing company purchases 9000 parts of a machine for its annual requirement, ordering one month's usage at a time. Cost of each part is Rs.20. The order cost is Rs.15/order and carrying cost is 15% per year of the average inventory. You have been assigned to suggest a more economical purchasing policy for the company. What advice would you offer and how much would it save the company per year?

10. The following indicates the details of a project. The duration are in days,
'a' refers optimistic time, 'm' refers most likely time and 'b' refers pessimistic time estimate.

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Activity :   1-2  1-3  1-4  2-4  2-5  3-4  4-5
a        :    2    3    4    8    6    2    2
m        :    4    4    5    9    8    3    5
b        :    5    6    6   11   12    4    7
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   a) Draw the network
   b) Find the critical path
   c) Determine the mean and standard deviation of the project completion time.

PART C
(Compulsory question, the question carries 20 marks)

11. A person requires 10,12 and 12 units of chemicals A, B and C respectively for his garden. A liquid product contains 5, 2 and 1 units of A, B and C respectively per jar. A dry product contains 1,2 and 4 units of A, B and C per carton. If the liquid product sells for Rs.3 per jar and the dry product sells for Rs.2 per carton, using simplex method, how many of each should be purchased to minimize the cost and meet the requirements?

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