

MBA
(SEM II) THEORY EXAMINATION 2022-23
QUANTITATIVE TECHNIQUES FOR MANAGERS

Time: 3 Hours

Total Marks: 100

Note: Attempt all Sections. If require any missing data; then choose suitably.**SECTION A**

- 1. Attempt all questions in brief. 2 x 10 = 20**
- a. State the scope of Operations Research.
 - b. Define uncertainty in business.
 - c. What is LPP in OR?
 - d. Define Vogel's method in transportation Problem.
 - e. State about Assignment Model.
 - f. What is Two-person zero-sum game?
 - g. What is Sequencing Problem in operations research?
 - h. Define Queue model.
 - i. What is replacement concept?
 - j. Define CPM for network.

SECTION B

- 2. Attempt any three of the following: 3 x 10 = 30**
- a. Discuss two Operations Research Methods to solve industrial management problems.
 - b. Describe steps involved in North West Corner method for solving Transportation Problem.
 - c. Explain Hungarian Algorithm for Assignment Problem with example.
 - d. Discuss the applications of Johnsons Algorithm for Sequencing problem.
 - e. What do you understand by Project Management? Also discuss the drawing of network diagrams.

SECTION C

- 3. Attempt any one part of the following: 10 x 1 = 10**
- a. What are the three Operations Research techniques for managerial decisions?
 - b. Discuss Decision tree approach and its importance in management.
- 4. Attempt any one part of the following: 10 x 1 = 10**
- a. Solve the following linear programming problem by graphical method:
 Maximize $Z = 6L_1 + 11L_2$
 Subject to:
 $2L_1 + L_2 \leq 104$
 $L_1 + 2L_2 \leq 76$
 and $L_1 \geq 0, L_2 \geq 0$.
 - b. Discuss the steps for initial feasible solution of Transportation Problem by using Least Cost Method.

5. Attempt any one part of the following:

10 x 1 = 10

- a. Find two optimal solutions to the assignment problem of machines to jobs for the cost matrix given below:

	J ₁	J ₂	J ₃	J ₄
m ₁	12	8	7	8
m ₂	6	6	4	8
m ₃	3	5	7	4
m ₄	1	3	5	4

- b. What is Game Theory? Also Discuss the steps involved in Two-person zero-sum game.

6. Attempt any one part of the following:

10 x 1 = 10

- a. An insurance company has three claims adjusters in its branch office. People with claims against the company are found to arrive in a Poisson fashion, at an average rate of 20 per 8-hour day. The amount of time that an adjuster spends with a claimant is found to have an exponential distribution, with mean service time 40 minutes. Claimants are processed in the order of their appearance.
- How many hours a week can an adjuster expect to spend with claimants?
 - How much time, on an average, does a claimant spend in the branch office?
- b. Explain the Applications of Poisson distribution for Queuing model with example.

7. Attempt any one part of the following:

10 x 1 = 10

- a. Explain Replacement of assets which fail suddenly with example.
- b. An office construction was analysed as follows where v_j stands for a job.
- v_1 and v_2 can start simultaneously, each one taking 10 days to finish.
 - v_3 can start after 5 days and v_4 after 4 days of starting v_1 .
 - v_4 can start after 3 days of work on v_3 and 6 days of work on v_2 .
 - v_5 can start after v_1 is finished and v_2 is half done.
 - v_3 , v_4 and v_5 take respectively 6, 8 and 12 days to finish.

Find the critical path and the minimum time for completion for above illustrations.