

Subject Code: MB1316/R13

M B A - I Semester Regular/Supply Examinations, Dec/Jan – 2015-16

**QUANTITATIVE ANALYSIS FOR BUSINESS DECISION**

Time: 3 hours

Max Marks: 60

Answer any **FIVE** of the following

All questions carry equal marks. **Q.No.8 is compulsory**

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1. A car hire firm has two cars which it hires out day by day. The number of demands for a car on each day is distributed as Poisson variate with mean 1.5. Calculate the proportion of days on which (i) Neither car is used, and (ii) Some demand is refused.
2. List the approaches for decisions under risk and explain with examples.
3. Solve the following LP problem using simplex method.

$$\text{Maximize } Z = 10X_1 + 15X_2 + 20X_3$$

Subject to

$$2X_1 + 4X_2 + 6X_3 \leq 24$$

$$3X_1 + 9X_2 + 6X_3 \leq 30$$

$$X_1, X_2, \text{ and } X_3 \geq 0$$

4. A manufacturing company has three factories  $F_1$ ,  $F_2$ , and  $F_3$  with monthly manufacturing capacities of 7000, 4000 and 10,000 units of a product. The product is to be supplied to seven stores. The manufacturing costs in these factories are slightly different but the important factor is the shipping cost from each factory to a particular store. The following table represents the factory capacities, store requirements and unit cost (in rupees) of shipping from each factory to each store. Here, slack is the difference between the total factory capacity and the total requirement.

| Factory      | Stores |       |       |       |       |       |       | Factory Capacity |
|--------------|--------|-------|-------|-------|-------|-------|-------|------------------|
|              | $S_1$  | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | $S_7$ |                  |
| $F_1$        | 5      | 6     | 4     | 3     | 7     | 5     | 4     | 7000             |
| $F_2$        | 9      | 4     | 3     | 4     | 3     | 2     | 1     | 4000             |
| $F_3$        | 8      | 4     | 2     | 5     | 4     | 8     | 3     | 10,000           |
| Store demand | 1500   | 2000  | 4500  | 4000  | 2500  | 3500  | 3000  |                  |

Find the optimal transportation plan so as to minimize the transportation cost.

5. What is transportation problem? Explain how would you obtain solution using NWC, LCM, VAM.



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6. Player A and B Play a game in which each player has three coins [25p, 50p and 100p (one rupee)]. Each of them selects a coin without the knowledge of the other person. If the sum of the values of the coins is an even number, A wins B's coin. If that sum is an odd number, B wins A's coin.
- a) Develop a payoff matrix with respect to player A.
  - b) Find the optimal strategies for the players.
7. Develop a zero-one programming model for assignment problem.
8. **Case Study:**  
A project consists of the following activities and the time estimates (in days). Summarize the CPM calculations in a tabular form including total, free and independent floats. Hence, find the critical path.

| Activity | Duration | Activity | Duration | Activity | Duration |
|----------|----------|----------|----------|----------|----------|
| 1-2      | 6        | 1-3      | 8        | 2-3      | 2        |
| 2-4      | 4        | 2-5      | 1        | 3-4      | 5        |
| 3-5      | 3        | 4-5      | 2        | 4-6      | 8        |
| 5-6      | 11       | 6-7      | 9        | 6-8      | 4        |
| 7-8      | 6        |          |          |          |          |

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