

Code: BA1T5

I MBA-I Semester-Regular Examinations FEBRUARY 2015**QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS**

Duration: 3 hours

Max. Marks: 70

SECTION-A**1. Answer any FIVE of the following:****5 x 2 = 10 M**

- a. Define median and mode.
- b. What is matrix inversion method?
- c. What are random variables?
- d. Binomial distribution.
- e. Simplex method.
- f. Which method is mostly used in solving transportation problem?
- g. Explain about dominance method in game theory.
- h. Dual simplex method.

SECTION – B**Answer the following:****5 x 10 = 50 M**

2. a) Find the rank of the matrix:

$$\begin{pmatrix} 1 & 2 & 1 \\ 2 & 4 & 3 \\ 3 & 6 & 2 \end{pmatrix}$$

OR

- b) Calculate standard deviation from the following data regarding the marks obtained by students in an Accountancy test.

| | | | | | | | | | |
|------------------|----|----|----|----|-----|----|----|----|---|
| Marks: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| No. of students: | 32 | 41 | 57 | 98 | 123 | 83 | 46 | 17 | 3 |

3. a) The balls in three bags are as follows: 1 white, 2 black, and 3 red balls; 2 white, 1 black and 1 red balls; and 4 white, 5 black and 3 red balls. One bag is chosen at random and two balls are drawn. They happen to be white and red. What is the probability that they have come from bag one?

OR

- b) If X and Y are independent Poisson varieties such that,

$$P[X = 1] = P[X = 2]$$

$$P[Y = 2] = P[Y = 3]$$

Find the variance of $X - 2Y$.

4. a) The mean life of a sample of 10 electric bulbs was found to be 1456 hours with standard deviation of 423 hours. A second sample of 17 bulbs chosen from a different batch showed a mean life of 1,280 hours with a standard deviation of 398 hours. Is there a significant difference between the means of two batches?

OR

- b) In a manufacturing company producing a same product on two machines. In the process of testing quality, 78 of defective products from a random sample of 1525 on machine-A and 52 of defective products from a random

sample of 875 on machine-B. Test it; is there any significant difference between performances of two machines?

5. a) Define LPP. Explain its importance in allocation of resources in management.

OR

- b) Solve the following LPP using the Simplex method.

$$\text{Maximize } Z=50X + 30Y$$

$$\text{Subject to } 4X + 2Y \leq 10$$

$$2X + 2Y \leq 8$$

$$X, Y \geq 0$$

6. a) What is a game? Explain about the two person zero and non-zero sum games. Discuss about the saddle point.

OR

- b) Solve the following game and find value of the game?

Players A & B Strategies

| | | | |
|----|----|---|----|
| -5 | 3 | 1 | 20 |
| 5 | 5 | 4 | 6 |
| -4 | -2 | 0 | -5 |

SECTION – C

7. Case Study

1 x 10 = 10 M

Solve the following Transportation problem:

| | | Store | | | a ₁ |
|---------|------------------|-------|----|----|----------------|
| | | A | B | C | |
| Factory | F1 | 10 | 8 | 8 | 8 |
| | F2 | 10 | 7 | 10 | 7 |
| | F3 | 11 | 9 | 7 | 9 |
| | F4 | 12 | 14 | 10 | 4 |
| | b ₁ → | 10 | 10 | 8 | |