



PG - 642

II Semester M.Com. Examination, July/August 2011  
(2007-08 New Scheme)

COMMERCE

Paper - 2.5 : Operations Research and Quantitative Techniques

Time : 3 Hours

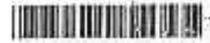
Max. Marks : 80

SECTION - A

1. Answer **any ten** of the following in about **3-4** lines **each**. **Each** sub-question carries **two** marks. (10×2=20)

- a) What is feasibility region ?
- b) What are forward pass and backward pass ?
- c) State the meaning of quantitative techniques.
- d) What is random variable ?
- e) What is stockout cost ?
- f) What is Expected value ?
- g) State the rules for constructing project network.
- h) What are Collectively Exhaustive Events ?
- i) What is Mathematical Expectation ?
- j) Discuss with decision trees.
- k) Define risk and uncertainty.
- l) What is multiple optimal solution ?

P.T.O.



## SECTION - B

Answer any three of the following.

(3×5=15)

2. Bring out the importance of Network analysis in business decisions.
3. Explain the properties of normal distribution.
4. Explain the classification of quantitative techniques.
5. The daily sales of a certain item are normally distributed with a mean of Rs. 8,000 and a S.D. of Rs. 100.
  - a) What is the probability that on a given day sales will be less than Rs. 8,210 ?
  - b) What is the probability that the sales will be between Rs. 8,100 and Rs. 8,300 ?
6. A company has to supply 1000 items per month at uniform rate and each time a production run is started it costs Rs. 200 cost of storing is Rs. 20 per item per month. The number of items to be produced per run has to be ascertained. Determine the total set up cost and average inventory cost if the run size is 500, 600, 700, 800. Find the optimal production run size using EOQ formula.

## SECTION - C

Answer any three questions. Each question carries 15 marks.

(15×3=45)

7. Explain the meaning of "Simulation" and state its usefulness in business decision making.
8. Use graphical method to solve the LPP :

$$\text{Maximize } Z = 3x_1 + 2x_2$$

$$\text{Subject to } 5x_1 + x_2 \geq 10$$

$$x_1 + x_2 \geq 6$$

$$x_1 + 4x_2 \geq 12$$

$$x_1, x_2 \geq 0.$$

9. A Project schedule has the following characteristics activity.

|             |     |     |     |     |     |     |     |     |     |     |      |      |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| Activity    | 1-2 | 1-3 | 2-4 | 3-4 | 3-5 | 4-9 | 5-6 | 5-7 | 6-8 | 7-8 | 8-10 | 9-10 |
| Time (Days) | 4   | 1   | 1   | 1   | 6   | 5   | 4   | 8   | 1   | 2   | 5    | 7    |

From the above information you are required to

- a) Construct a network diagram
  - b) Compute the earliest event time and latest event time
  - c) Determine the critical path and total project duration
  - d) Compute total, free, float for each activity.
10. 500 employees working for a Company of whom 260 smoke cigarettes of the 300 males, working for the company, 170 smoke cigarettes. What is the probability that an employee chosen at random.
- i) does not smoke cigarettes ?
  - ii) is female and smoke cigarettes ?
  - iii) is male or smokes cigarettes ?
  - iv) Suppose we meet a female employee of the company – what is the probability that she does not smoke cigarettes ?
  - v) Determine using the information given, whether cigarette smoking and gender are independent.
11. Write short notes on :
- a) Cost-time trade off in network analysis.
  - b) Probability distributions.
  - c) decision theory main features and limitation.