



PG – 814

II Semester M.Com. Examination, July 2012  
(2007 – 08 Semester Scheme) (NS)  
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. (10x2=20)
- a) Define optimum solution.
  - b) Explain the term pessimistic time estimates in PERT.
  - c) What are the motives for carrying inventory ?
  - d) What do mean by the term probability ?
  - e) Define EVPI. How is it calculated ?
  - f) What is selective inventory control ?
  - g) What is simplex method in linear programming ?
  - h) What is time cost trade in network analysis ?
  - i) What is normal distribution ?
  - j) What is the cost associated with inventory ?
  - k) Define a dummy arrow used in a network.
  - l) Define slack and surplus variable in LPP.

P.T.O.



## SECTION - B

Answer any three of the following :

(3x5=15)

2. Critically comment on the assumption based on which the PERT/CPM analysis is done for the projects.
3. What is the significance of utility as a basis of decision making ? State the assumptions under the theory of utility.
4. A banker claims that the life of a regular savings account opened with his bank average 15 months with an S.D of 6.45 months. Assuming that life of a regular saving account is normally distributed. Find what is probability that
  - A) There is balance in the savings account of a depositor at the end of 19 months ?
  - B) The savings account of a depositor will have been closed before 21 months ?
5. A firm manufacturers headache pills in two size A and B. Size A contains 1 grain of aspirin, 5 grains of bicarbonate and 1 grain of codeine. It is found by uses that it requires at least 12 grains of aspirin, 74 grains of bicarbonate and 24 grain of codeine for providing immediate effect . It is required to determine. The least number of pills a patient should take get immediate relief. Formulate the problem as a standard LPP.
6. Explain risk analysis in capital budgeting.

## SECTION - C

Answer any three questions. Each question carries 15 marks.

(15x3=45)

7. Use graphical method to solve the LPP :

Maximize 'Z' =  $40X_1 + 60X_2$  (subject to constraints)

$$2X_1 + X_2 \leq 70$$

$$X_1 + X_2 \geq 70$$

$$X_1 + 3X_2 \geq 90$$

$$X_1, X_2 \geq 0 \text{ (Non-negative constraints)}$$



- 8. Discuss the differences between decision making under certainty, uncertainty and risk.
- 9. The following table the activities of a construction project and duration :

Activity	1-2	1-3	2-3	2-4	3-4	4-5
Duration (days)	20	25	10	12	6	10

- i) Draw the network for the project
  - ii) Find the critical path.
10. What is normal distribution ? Highlight its chief use in operation uses in Operation Research.
11. A company has three warehouses ( $W_1, W_2, W_3$  and four stores ( $S_1, S_2, S_3, S_4$ ). The availability of a given commodity at these warehouses is as follows :  $W_1 = 7, W_2 = 6, W_3 = 9$ , the demand at the four stores is ;  $S_1 = 6, S_2 = 4, S_3 = 6$  and  $S_4 = 2$ . The cost of shipping one unit of commodity from warehouse 'i' to store 'j' are as follows :

	$S_1$	$S_2$	$S_3$	$S_4$
$W_1$	9	12	9	6
$W_2$	7	3	7	7
$W_3$	6	4	9	11

Find out an optimal shipping schedule which minimises the total shipping cost.

