

Roll No.

BCA-404

B. C. A. (Fourth Semester) EXAMINATION, May, 2012

Paper Fourth

OPERATIONS RESEARCH

Time : Three Hours]

[Maximum Marks : 75

Note : Section A is compulsory. Attempt *seven* questions out of ten questions from Section B and *one* question from Section C.

Section – A

9 each

1. Define operational research and discuss its scope.
2. Find the optimum transportation cost for the following problem. The unit transportation cost is given in the matrix below :

From\To	I	II	III	IV	Available
A	15	10	17	18	2
B	16	13	12	13	6
C	12	17	20	11	7
Requirement	3	3	4	5	

Section – B

6 each

3. What is Degeneracy ? Discuss a method to resolve degeneracy in L. P. problem.

P. T. O.

4. What are the main phases of O. R. study ?
5. What are the disadvantages of Big M-method over two-phase method ?
6. Define assignment problem with a suitable example.
7. Find the basic solution for :

$$3x + 6y + 5z + t = 12$$

$$x + 4y + z + 2t = 8$$

8. Discuss various cost associated with queuing problems.
9. Explain the concept of optimum service rate and optimum cost.
10. Formulate the transportation problem as generalized linear programming problem.
11. What is Simulation ? Explain the need of simulation in operational research.
12. Give the basic steps used for simulation.

Section - C

15 each

13. (a) Obtain the dual of the L. P. P. :

Maximize :

$$z = x_1 - x_2 + 3x_3$$

Subject to the constraints :

$$x_1 + x_2 + x_3 \leq 10$$

$$2x_1 - x_2 \leq 2$$

$$2x_1 - 2x_2 + 3x_3 \leq 6$$

$$\text{and } x_1, x_2, x_3 \geq 0.$$

- (b) What is non-linear programming ?

14. (a) A company has three plants at location A, B and C, which supply to warehouse located at D, E, F, G and H. Monthly capacities are 800, 500 and 900 units respectively. Monthly warehouse requirements are 400, 400, 500, 400 and 800 units respectively. Unit representation cost (in ₹) are given below :

From \ To	D	E	F	G	H
A /	5	8	6	6	3
B	4	7	7	6	6
C	8	4	6	6	4

Determine an optimum distribution for the company in order to minimize the total transportation cost.

- (b) What is Branch and Bound method for solving Integer programming problem ?