

Roll No.

56027

**MBA 2 Year 2nd Semester (N.S.)
2011 Examination-May, 2015**

OPERATIONS RESEARCH

Paper : MBA-207

Time : 3 hours

Max. Marks : 80

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

Note : Attempt **five** questions. Q.No. 1 from Section-A is **compulsory**. From Section-B, attempt **four** questions (**one** from each Unit). All questions carry equal marks.

SECTION - A

1. Explain and illustrate (if necessary) the following :
 - (a) Symbolic model
 - (b) Unboundedness
 - (c) Degeneracy in transportation model

- (d) Travelling salesman problem
- (e) Network
- (f) Merging activities
- (g) Saddle Point
- (h) SIRO system

SECTION - B

UNIT - I

2. Explain the characteristics and process of managerial decision making. How can OR help in it ?
3. Solve the following LPP :

$$\text{Maximise } z = 3x_1 + 4x_2 + x_3$$

$$\text{Subject to : } x_1 + 2x_2 + 3x_3 \leq 90$$

$$2x_1 + x_2 + x_3 \leq 60$$

$$3x_1 + x_2 + 2x_3 \leq 80$$

$$x_1, x_2, x_3 \geq 0$$

UNIT-II

4. A manufacturer wants to ship 22 loads of his product from three sources to five destinations. The distances in kilometers, from sources to destinations are given in the following matrix :

Destination						
Source	D ₁	D ₂	D ₃	D ₄	D ₅	Supply
S ₁	5	8	6	6	3	8
S ₂	4	7	7	6	5	5
S ₃	8	4	6	6	4	9
Demand	4	4	5	4	8	

Obtain an optimal solution to this problem.

5. Time taken (in hours) by five employees in performing five jobs is given in the following matrix :

Employees					
Jobs	A	B	C	D	E
P	10	5	13	15	16
Q	3	9	18	13	6
R	10	7	2	2	2
S	7	11	9	7	12
T	7	9	10	4	12

Find the optimal allocation of job. Will the optimal allocation change if job R cannot be assigned to employee E ? Show.

UNIT-III

6. Compare and contrast CPM and PERT. Which are the steps involved in their application ? Mention the areas of their application.

7. Demand pattern for roses (in dozen) at a flower shop is as given below :

Demand	70	80	90	100
No. of days	5	10	20	15

The roses are purchased at Rs. 10 per dozen and sold at Rs. 30 per dozen. All unsold roses are donated to a local hospital. How much dozens of roses should be purchased by the flower shop owner ? Also find the value of EUPI.

UNIT - IV

8. Explain the fields of applications of queuing theory and the main characteristics of a queuing system.
9. A firm has a single channel service station with the following arrival and service time probability distributions :

Inter arrival time (minutes)	Probability	Service time (minutes)	Probability
10	0.10	5	0.10
15	0.25	10	0.17
20	0.30	15	0.21
25	0.25	20	0.27
30	0.10	25	0.25

Using random number tables, simulate the queuing system for first ten arrivals.