Code: 06MC204

MCA - II Semester Supplementary Examinations, August/September 2012

OPERATIONS RESEARCH

(For students admitted in 2006, 2007 & 2008 only)

Time: 3 hours Max Marks: 60

Answer any FIVE questions

All questions carry equal marks

*****

1 (a) What are the limitations of LPP?

(b) Solve the following problem by simplex method

Minimize $z = x_1 - 3x_2 + 2x_3$ subjected to the constraints

$3x_1 - x_2 + 2x_3 \leq 7,$

$-2x_1 + 4x_2 \leq 12,$

$-4x_1 + 3x_2 + 8x_3 \leq 10,$

$x_1, x_2, x_3 \geq 0.$

2 (a) What do you understand by transportation problem?

(b) A company has 4 machines to do 3 jobs. Each job can be assigned to one and only one machine. The cost of each job on each machine is given below. Determine the job assignments which will minimize the total cost.

$$\begin{bmatrix} 18 & 24 & 28 & 32 \\ 8 & 13 & 17 & 18 \\ 10 & 15 & 19 & 22 \end{bmatrix}$$

3 Solve the travelling salesman problem, given $C_{12} = 16,\ C_{13} = 4, C_{14} = 12, C_{23} = 6, C_{34} = 5, C_{25} = 8, C_{35} = 6, C_{45} = 20, C_{ij} = C_{ji}, C_{ij} = \infty$, for all values of i and j not given in the data.

4 (a) Describe the various types of replacement situations.

(b) Explain the terms (i) Present worth factor (ii) Discount rate.

5 (a) Show that if the inter-arrival times is exponentially distributed, the number of arrivals in a period of time is a Poisson process and the converse is also true.

(b) Explain the basic queuing process.

6 (a) What are the objectives of holding inventory?

(b) A baking company sells one type of cake by weight. It makes a profit of Rs 9.50 on every kg of cake sold on the day it is baked. It disposes of all cakes not sold on the date it is baked at a loss of Rs 1.50 per kg. If demand known to be rectangular between 300 and 400 kg, determine the optimum amount to be baked.

7 (a) Differentiate between strict determinable games and non-determinable games.

(b) Show how a 'game' can be formulated as a linear programming problem.

8 Solve the following LPP by dynamic programming

Maximize $z = 2x_1 + 5x_2$ subjected to

$2x_1 + x_2 \leq 430$

$2x_2 \leq 460$

$x_1, x_2 \geq 0.$

*****