

**MASTER OF BUSINESS
ADMINISTRATION (RETAIL)
(MBARS)**

Term-End Examination

December, 2011

MRS-009 : OPERATIONS RESEARCH

Time : 3 hours

Maximum Marks : 100

Note : Attempt any five questions.

All questions carry equal marks.

1. (a) What is the significance of Operations Research in a business organisation ? 10
- (b) What are the characteristics of a good or model ? 10
2. (a) Write down and explain the general form of LP model. 10
- (b) A paper mill produces 2 grades of paper X and Y. It cannot produce more than 400 tons of X and 300 tons of Y in a week. There are 160 production hours in a week. It requires 0.2 and 0.4 hours to produce a ton of product X and Y with corresponding profit of Rs. 200 and Rs. 500 per ton. Formulate this as a LPP to maximize profit. 10

3. (a) What are the applications and limitations of LPP ? 10

(b) Find the maximum value of $z = 5x_1 + 7x_2$ subject to constraints 10

$$x_1 + x_2 \leq 4$$

$$3x_1 + 8x_2 \leq 24$$

$$10x_1 + 7x_2 \leq 35$$

$$x_1, x_2 \geq 0$$

4. Find the Optimum Integer solution to the following Integer programming problem 20

$$\text{Max } z = x_1 + x_2$$

$$\text{subject constraints } 3x_1 + 2x_2 \leq 5$$

$$x_2 \leq 2$$

$$x_1, x_2 \geq 0 \text{ and are integers}$$

5. (a) Explain the concept of degeneracy in transportation problem. 10

(b) Solve the following transportations problem for minimisation. 10

		Derivatives			Capacity
Sources		1	2	3	
1		2	2	3	10
2		4	1	2	15
3		1	3	1	40
Demand		20	15	30	65

6. A company has 4 machine's to do 3 jobs. Each job can be assigned to one and only one machine. Each job of each machine is as follows. Determine the job assignment which will minimise the cost. 20

		Machine's			
		W	X	Y	Z
Jobs	A	18	24	28	32
	B	8	13	17	18
	C	10	15	19	22

7. (a) A car park contains 5 cars. The arrival of cars is Poisson at a mean rate of Rs. 10 per hour. The length of time each car spends in the car park is exponential distribution with mean of 0.5 hours. How many cars are in the car park in an average ? 10
- (b) How can you describe a complete queering system ? 10
