

Code.No: RR410301

RR

SET-1

IV B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
OPERATIONS RESEARCH
(COMMON TO ME, MCT, MEP, AME)

Time: 3hours**Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks

- - -

1. a) Is there any scope for operations research being used in business discuss.
 b) By applying simplex method find the value of x_1, x_2

$$\begin{aligned} \text{to max } Z &= 5x_1 + 3x_2 \\ \text{ST } 3x_1 + 5x_2 &\leq 15 \\ 5x_1 + 2x_2 &\leq 10 \\ x_1, x_2 &\geq 0 \end{aligned}$$

Compare the solution with graphical method solution.

[8+8]

2. The ware houses W, X, Y, Z have the following amounts of stocks:

Ware house:	W	X	Y	Z
No. of Units:	20	18	15	10

Customers A, B, C requirement is as follows.

Customers	A	B	C
No of Units	20	20	13

The table below shows the costs in hundred of rupees of transporting one unit from warehouse to customer solve the transportation problem by finding initial basic feasible solution by North West corner rule.

[16]

	W	X	Y	Z
A	8	9	6	3
B	6	11	5	10
C	3	8	7	9

3. a) How is traveling salesman different from assignment problem..
 b) How is Johnson's Algorithm applied to 3 job n machine problem?
 c) The processing times of 6 jobs on 3 machines X, Y, Z is given as follows Find the idle times, total elapsed times when the processing order of machines is X Z Y.

[16]

	1	2	3	4	5	6
X	12	8	7	11	10	5
Y	7	10	9	6	10	4
Z	3	4	2	5	5	4

4. a) Does also group replacement of items better than individual replacement. Explain.
 b) A machine is due for repairs. It may cost Rs15,000 and last for 4 years. A new machine alternatively can be laid at Rs30,000 and lasts for 6 years. Assuming cost of capital 12% and ignores salvage value is it better to go for second alternative.

[8+8]

5. a) What are fair games and zero sum games. Are they same.
 b) What should the value of p be in the game with the following pay off matrix? [6+10]

		Player B		
		B ₁	B ₂	B ₃
Player A	A ₁	p	6	2
	A ₂	-1	p	-7
	A ₃	2	5	p

6. 40 cars can be accommodated in a parking lot. The arrival of cars is Poisson at a mean rate of 2 per minute. The park time of the car has negative exponential distributions with mean of 30 mins Determine:
 i) The number of cars in the packing space on an average. and
 ii) The probability of having zero cars in the car park space. [16]
7. a) Explain various inventory models of inventory management.
 b) A manufacturing concern has a demand of 20,000 units. Each item cost Rs.3, ordering cost is Rs90 per order and inventory carrying cost is Rs.30. Find EOQ and reorder level. [8+8]
8. Solve the following LPP using dynamic programming: [16]

$$\begin{aligned} \min Z &= 4x_1 + 3x_2 \\ \text{ST } 2x_1 + x_2 &\leq 72 \\ x_1 + 2x_2 &\leq 48 \\ x_1, x_2 &\geq 0. \end{aligned}$$

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