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(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID : 140851
187851

Roll No. | | | | | | | | | | |

B. Tech.

(SEM. I) THEORY EXAMINATION, 2015-16

OPERATION RESEARCH

[Time : 3 hours] **[Total Marks : 100]**

Note : Attempt **all** questions.

SECTION – A

1. Attempt **any four** of the following : [5x4=20]

   (a) What is main advantage of an OR model ?

   (b) Describe the difference in standard form L.P.P. and canonical form L.P.P.

   (c) Solve L.P.P. by graphical method :

   Max. $Z = 8000X_1 + 7000\ X_2$

   Subject to constraints, $3X_1 + X_2 \leq 66$

   $X_1 + X_2 \leq 45$

   $X_1 \leq 20$

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M_2	1	2
M_3	7	4

and total run time of each department is 60 and 40 hours. Formulate L.P.P. to find maximize profit.

(e) Solve L.P.P. by Simplex method

Max. $Z = 3x_1 + 5x_2 + 4x_3$

Subject to : $2x_1 + 3x_2 \leq 8$

$3x_1 + 2x_2 + 4x_3 = 15$

$2x_2 + 5x_3 \leq 10$ and

$x_1, x_2, x_3 \geq 0$

2. Attempt **any two** of the following : (10x2=20)

(a) Find optimum basic feasible solution by VAM in the following transportation problem.

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

(c) What are the essential characteristic of dynamic programming problem ? State Bellman's principle of optimality.

3. Attempt **any two** of the following : (10x2=20)

(a) Explain any three techniques that are used in decision making under uncertainty.

(b) Find the range of values of p and q which will render the entry cell (2 2) a saddle point from the game.

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Player A	1	3	3	4	0
	2	5	4	3	7

4. Attempt **any two** of the following : (10x2=20)

(a) What is Economic Order Quantity ? Discuss any one, step by step, the development formula.

(b) The demand for an item is deterministic and constant over the time and it is equal to 600 units per year. The per unit cost of item is Rs. 50 while the cost of placing an order is Rs. 5. The inventory carrying cost is 20% of the cost of inventory per annum and the cost of storage is Re. 1 per unit per month. Find the optimal ordinary quantity when stockouts are permitted. If the stock out are not permitted, what would be the loss to the company?

(c) Describe the simulation process. Write the different types of simulation languages.

(iii) Jockeying

(c) Draw a network diagram and determine the total free and independent floats and identity the critical path.

Activity :	0-1	1-2	1-3	2-4	2-5	3-4	3-6	4-7	5-7	6-7
Duration :	2	8	10	6	3	3	7	5	2	8

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