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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD B. Tech III Year I Semester Examinations, February/March - 2016 OPERATIONS RESEARCH

(Computer Science and Engineering)

Time: 3 hours

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2257

Max. Marks: 75

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MP:

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Answer any five questions All questions carry equal marks

1.a) Explain the graphical procedure for solving linear programming problem of two decision variables.

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PART -

b) Minimize $z = 2y_1 + 3y_2$ subject to the constraints

$$y_1 + y_2 \ge 5$$

$$y_1 + 2y_2 \ge 6$$

 $y_1 \ge 0, \quad y_2 \ge 0$

Using big-M method.

[7+8]

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2.a) Explain the mathematical formulation of the transportation problem.

b) Determine an initial basic feasible solution for the following transportation problem using North-West corner rule, where O_i and D_j represent ith origin and jth destination respectively.

[7+8]

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	O_1	6	4	V	5	14	
	O_2	8	9	2	γ.	/ 16	
	O_3	4	3-	~ 0	2 <	5	
De	mand	6	1 12	15	4	35	Ð

- 3.a) Explain the mathematical formulation of Assignment problem.
 - b) A car hire company has one car at each of five depots a, b, c, d and e. A customer requires a car in each four, namely A, B, C, D, E. Distance (in kms) between depots (origin) and towns (destinations) are given as below.

	a	V. D.	° c	a	e ·
řet.	Casher.	GEO SAN		arthering	EEEE,
Α	160	130	175	190	200
В	135	120	130	160	175
C	140	110	155	170	185
D	50	50	80	80	110
E	55	35	70	80	105

How should the cars be assigned to customers so as to minimize the distance travelled?

4. There are 4 jobs each of which has to go through the machines M₁, M₂, M₃, M₄, M₅ and M₆ in the order M₁, M₂, M₃, M₄, M₅ and M₆. Processing times are as given below:

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	M_1	Мэ	M_3	M_4	M_5	M_6	
Α	20	10	9	4	12	27	
Job(j)_B	19	8	11	8	10	21	20 er
C	13	7	10	7	9	17	200
D	22	6	5	6	10	14	

Determine a sequence of these four jobs which minimize the total collapsed time T. Also find T.

Type Value (Rs)s Weight (tons) A 20 1 B 50 2 C 60 2 Minimize $z = 3x + 4$ Subject to $x \le 3$, $3x + 4y \le 11$. Explain maxi-min and mini-max principle used in game theory with examples. Solve the game using dominance. [8+ 1 3 4 7 9 5 3 8 10 4 5 5 6 The cost of a machine is Rs 5000. The running cost and the salvage value of the machine are given below. Find when the machine should be replaced. [1		ist be sh	iipped. I)etern	nine the loa	ding which	will ma	ximize	the tota	ıl value.	5
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