Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – SUMMER • 2015

Subject Code: 171503 **Date:12/05/2015**

Subject Name: Resource Optimization Techniques

Time:02.30pm-05.00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 (a) Define Operation Research. Where and how it is useful in industry? Give examples. **07**

(b) Explain scope and phases of O. R. Methods with examples. **07**

Q.2 (a) What is Linear programming? State the applications of it and also discuss its advantages in brief. **07**

(b) Find an initial basic feasible solution to the following T.P. using Vogel's approximation method(test optimality also) **07**

Destinations

		1	2	3	4	Availability
	A	7	2	5	5	40
Origins	B	4	4	6	5	25
	C	5	3	3	2	20
	D	4	-1	4	2	30
Requirement		30	35	25	25	

OR

(b) What is the significance of Vogel's Approximate Method? What is optimality test? How stepping stone method is different from earlier? **07**

Q.3 (a) How a problem is formulated? How a model is constructed? How solution is derived? **07**

(b) Solve the following sequential problem by graphical and arithmetic method: **07**

job	A	B	C	D	E	X	Y	Z
Machine-A	7	6	24	18	17	13	11	6
Machine-B	8	12	14	10	22	9	5	23

OR

Q.3 (a) Explain Hungarian Method with a suitable example. **07**

(b) Explain in short: **07**

(a) feasible solution, (b) basic feasible solution

(c) Optimum solution, (d) non-degenerate feasible solution.

Q.4 **(a)** What do you understand by Travelling Salesman Problem? Explain with a suitable example. **07**

(b) Explain the Kan DALL'S notation to represent a queuing model. Also explain Balking and Jockeying in queuing. **07**

OR

Q.4 **(a)** Differentiate slack and surplus variables. What is degeneracy? What is the role of duality in LPP? **07**

(b) Solve the following LPP. **07**

Maximize z= 4x1+5x2-3x3,
Subject to x1+x2+x3=10,
X1-x2>=1,
2x2+3x2+x3<=40,
X1,x2,x3>=0.

Q.5 **(a)** What do you understand by Group Replacement Policy? Explain staffing problem with suitable examples. **07**

(b) What are causes of replacement of a machine? How it can solve with OR? **07**

OR

Q.5 **(a)** Explain the following terms related to Game theory: **07**

A. Game,
B. mixed strategy,
C. Two person's zero sum game.
D. saddle point.

(b) Solve the following Game: **07**

		Player-B			
	2	1	2	3	4
Player-A	0	-7	-4	1	2
	1	5	8	-3	2

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