GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-VII • EXAMINATION – WINTER 2013

Subj	de: 172503 Date: 07-12-	2013		
Subje Time Instru	ect e: 1 ctio	Nai 0:3(ons:	ne: Optimization Methods) TO 01:00 Total Mark	s: 70
	1. 2. 3.	Att Ma Fig	empt all questions. Ike suitable assumptions wherever necessary. gures to the right indicate full marks.	
Q.1		(a) (b)	Explain procedure of modeling a LP Problem Explain following term with neat sketch on graph 1. Unbounded region 2. Infeasible region 3. Feasible region	07 07
Q.2		(a)	Solve following LP problem using simplex method MAX: $350X1 + 300X2$ S.T.: $1X1 + 1X2 \le 200$ $9X1 + 6X2 \le 1566$ $12X1 + 16X2 \le 2880$ $X1 \ge 0$ $X2 \ge 0$	07
		(b)	A small manufacturer employs 7 skilled men and 12 semi skilled men for making a product in two qualities: a deluxe model and an ordinary model. The production of a deluxe model requires 3-hours work by a skilled man and a 2-hour work by a semi skilled man. The ordinary model requires 2- hour work by a skilled man and a 4-hours work by a semi skilled man. According to worker union's rules, no man can work more than 8-hours per day. The profit of the deluxe model is Rs.2200 per unit and that of the ordinary model is Rs.1600 per unit. Formulate a linear programming model for this manufacturing situation to determine the production volume of each model such that the total profit is maximized.	07
		(b)	OR Solve following problem using Big. M. Method Maximize z=4x+5y Subject to 2x+3y≤8 3x+y≥4 x,y≥0	07
0.3		(a)	Explain various methods of transportation problem solution with	07

- **Q.3** (a) Explain various methods of transportation problem solution with suitable example
 - (b) Describe traveling salesman problem in detail with a case problem. 07

OR

Q.3 (a) Solve the following assignment problem using Hungerian method. The matrix 07 entries are processing times in hours.

			Operator				
		1	2	3	4	5	
	1	20	22	35	22	18	
	2	4	26	24	24	7	
Job	3	23	14	17	19	19	
	4	17	15	16	18	15	
	5	16	19	21	19	25	

(b) What do you mean by stepping stone method of solving transportation 07 problem optimally? Explain in detail with suitable example

Q.4	(a)	Explain	simulation	model	for	inventory	management	with	а	case	07
		problem									

(b) Solve following game problem using method of your choice 07 Player B

			I layer D	
	Strategy	1	2	3
	1	1	7	2
Player A	2	6	2	7
·	3	6	1	6
			OR	

Q.4	(a)	Explain applications of simulation with suitable examples				
0	(b)	Describe linear programming method to calve some problem with	07			

- Q.4 (b) Describe linear programming method to solve game problem with 07 suitable example
- Q.5 (a) There is congestion on the platform of Ahmed Railway station. The trains 07 arrive at the rate of 45 trains per day. The waiting time for any train to flag-off is exponentially distributed with an average of 65 minutes. Calculate the following:

 i) The mean queue size.
 ii) The probability that the queue size exceeds 15.

 (b) Explain the properties of dual problem with an example 07

OR

- Q.5(a) Discuss the applications of quing theories in detail07(b) Use dual simplex method to solve the following07Minimize Z = 2x + 3y07Subject to $3x + 4y \ge 5$ $4x + 5y \ge 7$
 - $x + 2y \le 4$ $x, y \ge 0$
