Seat No.: _____   **www.FirstRanker.com**   Enrolment No. **www.FirstRanker.com**

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VIII (OLD) EXAMINATION – WINTER 2018

Subject Code: 180503   **Date: 19/11/2018**

Subject Name: Process Simulation & Optimization

Time: 02:30 PM TO 05:00 PM   **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)**	Explain sequential modular approach.	**07**
	(b)	Explain the application of optimization for optimal pipe diameter.	**07**
Q.2	**(a)**	Discuss the six steps procedure to solve optimization problem.	**07**
	(b)	Discuss obstacles to optimization.	**07**

OR

	(b)	We want to schedule the production in two plants, A and B, each of which can manufacture two products: 1 and 2. How should the scheduling take place to maximize profits while meeting the market requirements based on the following data :	**07**

Plant	Material processed, kg/day		Profit, Rs/kg	
	1	2	1	2
A	MA1	MA2	SA1	SA2
B	MB1	MB2	SB1	SB2

How many days per year should each plant operate processing each kind of material?

Q.3	**(a)**	Explain partitioning and tearing.	**07**
	(b)	Write down various professional simulation packages and explain features of any one shortly.	**07**

OR

Q.3	**(a)**	Discuss features of basic tearing algorithm.	**07**
	(b)	Describe steps of Barkley and Motard algorithm.	**07**
Q.4	**(a)**	Explain : feasible region, local minimum, global minimum, continuity of function.	**07**
	(b)	Explain convexity and concavity with examples.	**07**

OR

Q.4	**(a)**	Determine the convexity/concavity of function $f(x) = 2x_1 + 3x_2 + 6$	**07**
	(b)	Explain procedure of simplex method.	**07**
Q.5	**(a)**	Minimize $f(x) = x^2 - x$ using Newton method. Take initial guess = 3	**07**
	(b)	Explain algorithm of Steepest Descent method.	**07**

OR

Q.5	**(a)**	Minimize $f(x) = 4x_1^2 + 5x_2^2$ subject to $2x_1 + 3x_2 - 6 = 0$ using Lagrange multipliers method.	**07**
	(b)	Explain algorithm of Golden section method.	**07**

****