M.Tech. (CSE) (2018 Batch)   (Sem.–3)
OPTIMIZATION TECHNIQUES
Subject Code : MTCS-304-18
M.Code : 76511

Time : 3 Hrs.   **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :
1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWELVE marks.**

1. Enlist the applications of Optimization in relevance to Computer Science and Engineering.

2. Explain the General structure of an optimization algorithm. Also explain how convergence is checked.

3. Using Graphical method, solve the following optimization problem

   Minimize $f(x) = x_1^2 + x_2^2 + 2x_2$

   Subject to : $a_1(x) = x_1^2 + x_2^2 - 1 = 0$

   $c_1(x) = x_1 + x_2 - 0.5 \geq 0$

   $c_2(x) = x_1 \geq 0$

   $c_3(x) = x_2 \geq 0$

4. Solve using Branch and Bound

   Minimize $Z = 4x_1 + 3x_2$

   Subject to $5x_1 + 3x_2 \geq 30$

   $x_1 \leq 4$

   $x_2 \leq 6$

   $x_1, x_2 \geq 0$ and are integers

5. Explain the basic version of PSO as developed by Kennedy and Aberhart.

6. What are the recent trends in applications of linear and quadratic programming?

7. Solve the following quadratic programming using Wolfe's Method

   $\text{Max } f(x) = x_2 - x_1^2$

   Subject to $x_1 + x_2 \leq 1$

   $x_1, x_2 \geq 0$

8. Describe Gomory's algorithm to solve Integer Programming Problem.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.