Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.Tech (EE)/SEM-1/PSM-104C/2012-13

2012
OPTIMIZATION TECHNIQUE

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Answer any *five* questions $5 \times 14 = 70$

1. a) What is population based optimization technique ? Briefly explain the merits and demerits of population based optimization technique over classical methods.

   b) Write down the different steps of differential evolution algorithm. 5 + 9

2. What is particle swarm optimization technique ? Write down the algorithm of particle swarm optimization applied to economic load dispatch. 4 + 10

3. Minimize $f(x) = x^2 + 3x$ using any population based optimization technique. Use single iteration. Take standard input parameters value.

4. Draw and explain the flow chart of genetic algorithm applied to any optimization technique.

5. What is Artificial Neural Network (ANN) ? Compare ANN with Biological Neuron. What are feed forward and Recurrent Network ? Write down the flow chart of Back Propagation Algorithm. What is Hamming Distance ? Classify different types of Associative memory. 2 + 3 + 2 + 3 + 2 + 2

6. What do you mean by single variable optimization ? State different theorems for single and multi variable optimization. Prove them. 3 + 11

7. What do you mean by Linear Programming Problem (LPP) ? Mathematically represent the standard form of LPP. Solve the equations by Gauss-Jordan complete elimination methods.

$2X_1 - X_2 + 2X_3 - X_4 + 3X_5 = 14,$

$X_1 + 2X_2 + 3X_3 + X_4 = 5,$

$X_1 - 2X_3 - 2X_5 = -10.$ 3 + 4 + 7