B.E. Civil Engineering - Third Year - Second Semester

B.E. Information Technology - Third Year - Second Semester

B.E. Metallurgical and Material Engineering - Third Year - Second Semester

B.E. Construction Engineering - Fourth Year - Second Semester

B.E. Electrical Engineering - Fourth Year - Second Semester

B.E. Electronics and Tele-Communication Engineering - Fourth Year - Second Semester

B.E. Instrumentation and Electronics Engineering - Fourth Year - Second Semester

B.E. Mechanical Engineering - Fourth Year - Second Semester

B.E. Power Engineering - Fourth Year - Second Semester

B.E. Production Engineering - Fourth Year - Second Semester

B.E. Computer Science & Engineering - Fourth Year-Second Semester

**Sub : Optimisation Techniques for Engineering Design ( Open Elective)**

Full Marks : 100                                                                 time : 3 hrs

Answer any five questions (20 X5 = 100)

1. a) Classify optimization techniques. Explain the role of optimization in design.

   b) Develop the N.L.P of an engineering problem for optimum design.

                                                                                            10 + 10

2. a) find out the value of x at which the following function is minimum, maximum or point of inflection.

   $F(x) = x^4 - 2x^3 + 6x^2 5x + 4$

   b) Apply Interval halving method or Golden Section method to find out minimum value of the following objective function ( 2 iterations)

   $f(x) = X^2 + 25/X$.

   c) How is secant method used to find an optimum solution?

                                                                                            5+10+5

3. a) Explain Simplex method for multivariable optimisation.

   b) Apply Cauchy's Steepest Descent method for multivariable optimization for the following function

   $f(x) = ( x_1 - 2x_2 - x_1x_2)^2$   ( two iterations )

                                                                                            5+10+5

   c) Why Marquard method is more efficient ?

                                                                                            [ Turn over

[    2

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