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Roll No. ....

Fifth Semester

B.Tech.[PSCT]

SUPPLEMENTARY EXAMINATION

(Feb.-2019)

(PT 307) Optimization Techniques

Time: 3Hours

Max. Marks: 50

<b>Note:</b> Attempt any five questions Assume suitable missing data, if any All questions carry equal marks
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Q.1 (a) Write about the essential features of an optimization problem. (5)

(b) Write the different types of classification of optimization problems. (5)

Q.2 (a) Write the necessary and sufficient conditions for single variable optimization problem. (3)

(b) Find the minimum point for following function between  $x = 2$ ; and  $x = 4$  by using Interval Halving Method

$$f(x) = x^2 + \frac{54}{x}$$

(7)

Q.3 (a) Write the algorithm of Golden Section Search Method. (5)

(b) Write the algorithm of Simplex Downhill method for unconstrained optimization. (5)

Q.4 (a) What are you understand by a constrained optimization problem? Explain with an example? (5)

(b) Minimize the following function using Inverse Internal Penalty function Method (Using analytical approach)

P.T.O.

$$f(x) = x$$

Subjected to  $5 - x \leq 0$

(5)

Q.5 (a) Minimize the following function using Kuhn-Tucker Conditions

$$f(x_1, x_2) = x_1^2 + x_2^2 + 60x_1$$

Subjected to  $g_1 = x_1 - 80 \geq 0$  and  $g_2 = -x_1 + x_2 - 120 \geq 0$  (7)

(b) Explain the Lagrangian method to minimize the constrained optimization problem by using. (3)

Q.6 (a) Explain a bracketing method for single variable optimization. (5)

(b) What are you understand by multi-objective optimization explain with an example. (5)

END