Sub Code: REE051

Paper Id: 120504 Roll No: | | | | | | | | | | | | | |

BTECH
(SEM V) THEORY EXAMINATION 2019-20
POWER SYSTEM OPTIMIZATION

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a.	What do you understand by optimization? Write any two application of optimization in electrical engineering field.
b.	Under what condition is the solution of LPP; 1-Unbound 2-Infinite?
c.	What is a one-dimensional minimization problem?
d.	Discuss about penalty function method.
e.	What is a multistage decision problem?
f.	State and explain genetic algorithm.
g.	What do you understand by economic dispatch problem?

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a.	Mention the rules for primal-dual conversion and using it write the dual of the following LPP minimize $Z= 20y_1 + 30y_2$ subject to $2y_1 + 4y_2 \le 40$ $y_1 + y_2 \le 12$ $5y_1 + y_2 \le 40$ $y_1, y_2 \ge 0$
b.	Compare the ratios of intervals of uncertainty (Ln/L0) obtainable in the following methods for n = 2, 3. . . 10: (i) Exhaustive search (ii) Dichotomous search with $\delta = 10-4$ (iii) Interval halving method
c.	What are the similarities and differences between the traditional methods of optimization and genetic algorithm?
d.	How is the final value problem converted into an initial value problem? Also draw the block diagram representation of both the types of problem.
e.	The fuel cost of the first generator is given by $C_1= 100+2P_1+0.005P_1^2$ $C_2= 200+2P_2+0.01P_2^2$ Where P_1 and P_2 are in MW. The plant supplies of 450MW. Find (i) Economic load scheduling of two units and incremental fuel cost (ii) find penalty factor. Neglect losses.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Use the Simplex method, Maximize $P = 70X_1+50X_2+35X_3$ subject to $4x_1+ 3x_2+ x_3 \le 240$ $2x_1 + x_2+ x_3 \le 100$ $x_1, x_2, x_3 \ge 0$
(b)	Find the Minimum of f= x(x-1.5) in the interval (0, 1) to within 10% of the exact value using dichotomous method (use $\delta = .001$).

Sub Code: REE051

Paper Id: 120504 Roll No: | | | | | | | | | | | | | |

4. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Using dual simplex, Minimize $C = 40x_1 + 12x_2 + 40x_3$ subject to $2x_1 + x_2 + 5x_3 \geq 20$ $4x_1 + x_2 + x_3 \geq 30$ $x_1, x_2, x_3 \geq 0$
(b)	How is interior penalty function method different from exterior penalty function method?

5. Attempt any *one* part of the following: 7 x 1 = 7

(a)	How can you solve a trajectory optimization problem using dynamic programming?
(b)	Explain with example the concept of sub-optimization and principle of optimality.

6. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Construct the objective function to be used in GAs for a minimization problem with mixed equality and inequality constraints.
(b)	What is real code GAs? Explain crossover operator for real code Gas.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Explain the optimal generator scheduling for the thermal units when losses are considering. Also explain ITL and penalty factor and write the algorithm for the same.
(b)	What is the difference in the optimal scheduling of thermal and hydro thermal units and how is it accomplished in the hydrothermal unit?