Printed pages: 01 **Sub Code: MTEE043**

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M. TECH.
(SEM-II) THEORY EXAMINATION 2018-19
POWER SYSTEM OPTIMIZATION

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

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

SECTION A

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

a) Give three classifications of optimization problems with examples.
b) Discuss about penalty function method.
c) What is incremental fuel cost? Discuss the characteristics.
d) Define the BUS formation for power flow analysis.
e) Define the term "Fuzzy set theory in power system''.
f) What do you mean economic load dispatch.
g) What do mean by dispatch based on penalty function.

SECTION B

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

a) Explain generation cycle. And differentiate between genetic and traditional method. and applicationof genetic in optimization.
b) Explain the evaluation of incremental transmission loss.
c) Explain Short –Range fixed head hydrothermal Scheduling.
d) Explain the Fibonacci and golden section method. And also differentiate between them.
e) What are limit cycles? How can stability of a limit cycle can be judged by perturbation technique?

SECTION C

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

a) State the necessary and sufficient conditions for the unconstrained minimum of a function.
b) What is the difference between Newton and Quasi-Newton methods?

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

a) Explain unconstrained optimization using genetic algorithms.
b) What are the assumptions to be made while pumped storage hydro scheduling with lambda-gamma iteration?

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

a) Discuss about hydraulic continuity equations.
b) Determine the economic operation points for a three unit generating units using First Order Gradient Approach when delivering a total load of 800 MW by making suitable assumptions. Up to 2 iterations after the initial assumptions.

H1 = 510 + 7.2 P1 + 0.00142 P1 2 (Mbtu/H); 600MW ≤ P1≤150MW
H2 = 310 + 7.85 P2 + 0.00194 P2 2 (Mbtu/H); 400MW ≤ P2≤100MW
H1 = 78 + 7.97 P3 + 0.00482 P32 (Mbtu/H); 200MW ≤ P3≤50MW
The fuel cost for the units are, 1.1 Rs/hr, 1 Rs/hr, 1 Rs/hr respectively for the plant.

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

a) Define multiobjective dispatch for active and reactive power balance.
b) Define hydro plant modeling for long term operation.

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

a) What is the major difference between the simplex and karmarker's method?
b) is the decomposition method efficient for all LP problems.