

Code: R7410204

B.Tech IV Year I Semester (R07) Supplementary Examinations December 2015

POWER SYSTEM OPERATION & CONTROL

(Electrical & Electronics Engineering)

(For 2008 Regular admitted batch only)

Time: 3 hours

Max. Marks: 80

Answer any FIVE questions
All questions carry equal marks

- 1 The fuel inputs per hour of plants 1 and 2 are given as:
 $F_1 = 0.2P_1^2 + 40P_1 + 120$ Rs. per hour
 $F_2 = 0.25P_2^2 + 30P_2 + 150$ Rs. per hour
Determine the economic operating schedule and the corresponding cost of generation if the maximum and minimum loading on each unit is 100 MW and 25 MW, the demand is 180 MW, and transmission losses are neglected. If the load is equally shared by both the units, determine the saving obtained by loading the units as per equal incremental production cost.
- 2 Derive the expression formula for calculating transmission line losses.
- 3 Discuss the various problems in hydrothermal scheduling.
- 4 Explain briefly about mathematical modeling of speed governing system.
- 5 Draw the block diagram, representation of isolated power system and derive the expression for dynamic response.
- 6 For the uncontrolled two area system, estimate the oscillating frequency of the system response following a disturbance in either area in the form of step change in electrical load. Parameters for two identical areas are given as
Incremental regulation $R = 2.5$ Hz/P.U MW
Inertia constant $H = 5$ secs
Damping coefficient $D = 1$ p.u
Tie-line is 10% of area capacity
Tie-line operating power angle $= 45^\circ$
Nominal frequency $f_0 = 50$ Hz.
- 7 Derive the transfer function model of single area power system provided with integral controller and explain the steady state static response.
- 8 Explain briefly about series and shunt compensation in transmission systems and explain different schemes available for compensation.
