

B.Tech III Year II Semester (R13) Regular & Supplementary Examinations May/June 2017

POWER SYSTEM OPERATION & CONTROL

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- Sketch the heat rate curve of thermal power plants and explain its significance.
 - Sketch the cost curve of thermal power plants and explain the significance.
 - What is meant by short term hydrothermal scheduling?
 - Why hydrothermal coordination is required?
 - What is area frequency response characteristic?
 - What is the difference between single area and multi area systems?
 - What are static compensators? Give examples.
 - What are the general specifications of load compensators?
 - What is meant by market power?
 - Define transmission pricing.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 What is meant by optimal generation allocation? Derive the conditions for optimal allocation of generation among the generators in a thermal plant including transmission losses.

OR

- 3 What are incremental fuel and production costs? Sketch the input and output characteristic of a thermal plant and explain its significance. Derive the conditions for optimal power allocation between the generators in a thermal power plant neglecting losses. Discuss demerits of a method in which optimal generation allocation of a thermal plant including losses are considered.

UNIT – II

- 4 What is the significance of penalty factor in economic scheduling? Using Lagrangian multipliers, develop mathematical expressions for the solution of economic hydrothermal scheduling problem.

OR

- 5 Explain the operational modeling of speed governing system and its implementation in hydrothermal system.

UNIT – III

- 6 Explain the load frequency problem with an example of two plants connected through a tie line.

OR

- 7 Write a note on load frequency control and economic dispatch control systems.

UNIT – IV

- 8 What are the objectives of reactive power compensation in a transmission system? Explain the behavior of an uncompensated transmission line under load.

OR

- 9 The load at the receiving end of a three-phase, overhead line is 30 MW, power factor 0.85 lagging, at a line voltage of 33 kV. A synchronous compensator is situated at the receiving end and the voltage at both ends of the line is maintained at 33 kV. Calculate the MVAR of the compensator. The line has a resistance of 5Ω per phase and inductive reactance (line to neutral) 20Ω per phase.

UNIT – V

- 10 What is meant by congestion? Write a note on management of intra / inter zone congestion.

OR

- 11 Explain short term price forecasting for competitive power system operation.
