B.Tech IV Year I Semester (R15) Regular Examinations November/December 2018

POWER SYSTEM OPERATION & CONTROL

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Explain heart rate curve with neat sketch.
(b) Define incremental fuel and production cost of thermal power plant.
(c) Draw the block diagram of turbine model.
(d) What is the need for optimal scheduling of long term hydro thermal power plant?
(e) Explain control Area concept.
(f) Define economic load dispatch.
(g) Write disadvantages of series compensation.
(h) What is the need for reactive power control in power system?
(i) Draw the block diagram of restructured power system.
(j) Define congestion pricing.

PART – B

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

UNIT – I

2 (a) Explain optimum operation of generators using penalty factor approach.
(b) For a two bus system, if a load of 125 MW is transmitted from plant to the load located at bus 2, a loss of 15.625 MW is incurred. Determine the generation schedule and the load demand if the cost of received power is Rs. 24 per MWhr. Solve the problem using co-ordination equation and penalty factor approach. The incremental production costs of the plants are: $\frac{dF1}{dP1} = 0.025P1 + 15$ $\frac{dF2}{dP2} = 0.05P2 + 20$.

OR

3 (a) Explain the equality and inequality constraints of unit commitment.
(b) Explain the incremental cost curves for optimum operation of generators.

UNIT – II

4 Derive an equation for long term Hydro thermal scheduling with neat sketch.

OR

5 Derive the mathematical modeling of steam power system with neat block diagram.

UNIT – III

6 (a) Derive the mathematical modeling of Load frequency control of a single area system.
(b) Write short notes on control area concept and area control error.

OR

7 (a) What is the necessity of keeping frequency constant?
(b) Explain the economic load dispatch controller with neat block diagram.

UNIT – IV

8 (a) What is reactive power? Explain the generation and absorption of reactive power.
(b) Write short notes on Inductor VAR compensators.

OR

9 (a) Explain the fundamental characteristics of excitation system.
(b) Explain the comparisons of different types of compensating equipment for transmission systems.

UNIT – V

10 What is restructuring of power system and explain the market operations in the power system.

OR

11 List out the transmission pricing methods and explain any two methods of transmission pricing.

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