R13

B.Tech III Year II Semester (R13) Regular Examinations May/June 2016
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)   Define and draw the thermal unit input-output characteristics.
 (b)   Define incremental fuel cost.
 (c)   What are the optimization techniques for long range hydro scheduling problem?
 (d)   Define hydrothermal scheduling problem.
 (e)   What is the function of load frequency Control?
 (f)   Explain the principle of tie-line bias control.
 (g)   What are the sources of reactive power? How is it controlled?
 (h)   What are the effects of capacitor in series compensation circuit?
 (i)   Define the zonal prices.
 (j)   Would zonal pricing mitigate market power? Explain.

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

UNIT – I

2   Explain heat rate curve and incremental production cost characteristics.

OR

3   The fuel input characteristics for two thermal plants are given by:
$$F_1 = (8P_1 + 0.024P_1^2 + 80)10^6 \text{ K-cal/hr}$$
$$F_2 = (6P_1 + 0.004P_2^2 + 120)10^6 \text{ K-cal/hr}$$
       where P_1 and P_2 are in Megawatts
       Assuming the cost of fuel as Rs. 100/ton
       Calorific values of fuel at plant t = 4000 K-cal/hr
       Calculate the incremental production cost characteristic in Rs/MWhr at each plant.

UNIT – II

4   Discuss the transfer function of the speed governor.

OR

5   Explain about the short term hydro thermal scheduling.

UNIT – III

6   Two generators with ratings 100 MW and 300 MW operate at 50 Hz frequency. The system load increases by 100 MW when both the generators are operating at about half of their capacity. The frequency then falls to 49.5 Hz. If the generators are to share the increased load in proportion to their ratings, what should be the individual regulations? What should be regulations if expressed in, per unit Hertz/per unit megawatt?

OR

7   Draw the block diagram of proportional plus integral controller and show the steady state frequency error.

UNIT – IV

8   Explain how a load compensator works as a voltage regulator.

OR

9   What are the advantages and disadvantages of different types of compensating for transmission systems?

UNIT – V

10   Explain clearly the objectives of independent system operators.

OR

11   Illustrate the concept of inter-zonal/ intra-zonal congestion management with example.

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