

Code: EE7T1

**IV B.Tech - I Semester – Regular/Supplementary Examinations
October - 2019**

**POWER SYSTEM OPERATION AND CONTROL
(ELECTRICAL & ELECTRONICS ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11 x 2 = 22 M

1.

- a) What are hard type constraints?
- b) Define incremental efficiency.
- c) Define Static optimization problem.
- d) What is control area?
- e) Draw equivalent model of turbine.
- f) Write the difference between local economic dispatch controller and central economic dispatch controller.
- g) What is meant by synchronous condenser?
- h) List out the methods of improving power factor.
- i) What is the importance of reactive power compensation?
- j) What are the advantages of Series capacitor?
- k) What is Power Factor correction?

PART – B

Answer any **THREE** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) Derive general transmission line loss formula and state assumptions made in calculating B- coefficients. 8 M

b) The fuel cost of two units are given by

$$C_1 = C_1(P_{G1}) = 1.0 + 25P_{G1} + 0.25P_{G1}^2 \text{ Rs / hr}$$

$$C_2 = C_2(P_{G2}) = 1.5 + 45P_{G2} + 0.2P_{G2}^2 \text{ Rs / hr}$$

If the total demand on the generators is 250MW, calculate the economical load scheduling of the two units. 8 M

3. a) Write advantages and disadvantages of Hydro-thermal coordinate system. 8 M

b) Explain hydroelectric power plant models and discuss functions of its components. 8 M

4. a) Explain proportional plus integral load frequency control of a single area system with a neat block diagram. 8 M

b) Make a comparison between load frequency control and economic dispatch control. 8 M

5. a) What are the causes of low power factor? Explain the importance of improving power factor. 8 M
- b) Explain various methods of voltage control in power system. 8 M
6. a) Describe shunt and series compensation techniques with relevant diagrams. 8 M
- b) What is load compensation? Discuss its objectives in power system. 8 M