PVP 14

Code: EE7T1

IV B.Tech - I Semester – Regular/Supplementary Examinations
October - 2018

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

1.

a) Justify the production cost being considered as a function of real power generation.
b) What does the production cost of a power plant correspond to?
c) Define: i) Penalty factor ii) Current distribution factor.
d) Why is the optimal scheduling problem in the case of thermal plants referred to as static optimization problem?
e) What is the mathematical statement of the optimization problem in the hydro-thermal system?
f) What are scheduling methods for short-term hydro-thermal coordination?
g) What is meant by single area power system?
h) What are basic requirements of a closed-loop control system employed for obtaining the frequency constant?
i) What are the different methods of voltage control?

j) What is a synchronous condenser?

k) What are the objectives of load compensation?

PART – B

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

3 x 16 = 48 M

2. a) Explain how the incremental production cost of a thermal power station can be determined. 8 M

b) A plant consists of two units. The incremental fuel characteristics for the two units are given as

$\frac{dc_1}{dP_{G1}} = 15 + 0.08\ P_{G1}$ Rs./MWh ;

$\frac{dc_2}{dP_{G2}} = 13 + 0.1\ P_{G2}$ Rs./MWh

Find the optimal load sharing of two units when a total load of 300 MW is connected to the system. 8 M

3. a) What are types of scheduling problems in hydrothermal coordination? 8 M

b) Discuss short term hydro-thermal scheduling using gradient approach. 8 M

4. a) Explain diagram for isolated power system for load frequency control. 8 M

b) Explain the state variable model of single area load frequency controller with integral action. 8 M

5. a) What is meant by 8 M
i) Excitation voltage control ii) Synchronous condenser

b) Discuss the location of voltage–control equipment. 8 M

6. a) Explain the effects on uncompensated line and compensated line. 8 M

b) Compare the different types of compensating equipment for transmission systems. 8 M