

Code No: R1641023

R16

Set No. 1

IV B. Tech I Semester Supplementary Examinations, November - 2022

POWER SYSTEM OPERATION AND CONTROL

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any FOUR questions from Part-B

PART-A(14 Marks)

1. a) What are the assumptions considered in deriving the transmission loss expression? [3]
- b) What is the statement of optimization problem of hydro thermal system [2]
- c) What are the different constants that can be placed on the UC problem [2]
- d) Why should the system frequency be maintained constant [3]
- e) What is mean by tie line bias control? [2]
- f) What are the objectives of load compensation? [2]

PART-B(4x14 = 56 Marks)

2. a) Obtain the condition for optimum operation of a power system with 'n' plants [7]
- b) A system consists two power plants of fuel costs of [7]

$$C_1 \leftarrow \leftarrow 0.05P_{G1}^2 + 20P_{G1} + 1.5$$

$$\text{And } C_2 \leftarrow \leftarrow 0.075P_{G2}^2 + 22.5P_{G2} + 1.6$$

The system operates on economic dispatch with 100 MW of power generation by each plant. The ITL of plant-2 is 0.2. Find the penalty factor of plant-1.

3. a) Describe the need of optimal scheduling of hydrothermal system [7]
- b) Obtain the hydroelectric power plant model with neat diagram [7]
4. a) Describe the need for unit commitment [7]
- b) Using the DP method, how do you find the most economical combination of the units to meet a particular load demand [7]

5. a) Describe the mathematical modeling of speed governing system? Obtain transfer function from its. [7]
b) Obtain the expression for change in frequency under steady state of uncontrolled isolated power system. [7]
6. a) Explain the combined operation of an LFC and an ELDC system. [8]
b) Obtain the block diagram of load frequency control of two area system. [6]
7. a) Explain the effects on uncompensated line under no-load and load conditions [7]
b) What are the advantages and disadvantages of different types of compensating equipment for transmission systems [7]