CBCS SCHEME

18EE735

USN

Seventh Semester B.E. Degree Examination, July/August 2022
Reactive Power Control in Electric Power System

Time: 3 hrs.

Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Mention the objective in load compensation and explain. **(10 Marks)**
   b. Show that the principle of power factor correction is to compensate reactive power. **(10 Marks)**

OR

2 a. Explain phase balancing and power factor correction of unsymmetrical loads. **(10 Marks)**
   b. Explain specification of load compensator by considering parameter and factors. **(10 Marks)**

Module-2

3 a. What are fundamental requirements in AC power transmission and explain them. **(10 Marks)**
   b. Mention advantage and disadvantage of different type of compensating equipment for transmission system. **(10 Marks)**

OR

4 a. What are surge impedance and natural loading and explain their importance in reactive power management. **(10 Marks)**
   b. Discuss the effect of reactive power on uncompensated line under load. **(10 Marks)**

Module-3

5 a. Derive required reactance value of shunt reactor to long distance high voltage AC transmission line. **(10 Marks)**
   b. Discuss the objective and practical limitation of series compensation. **(10 Marks)**

OR

6 a. Derive general power transfer characteristic equation for symmetrical line. **(10 Marks)**
   b. Explain the concept of compensation by sectioning. **(10 Marks)**

Module-4

7 a. With basic circuit and waveform, explain operation of Thyristor Controlled Reactor (TCR). **(10 Marks)**
   b. Explain the Resonance Effect with service capacitor. **(10 Marks)**

OR

8 a. Explain how power system voltage control can be achieved by using synchronous condenser. **(10 Marks)**
   b. Explain HVDC application of synchronous condenser. **(10 Marks)**

Module-5

9 a. Explain how shunt capacitor and filter helps in eliminating harmonics. **(10 Marks)**
   b. Explain clearly the importance of reactive power management. **(10 Marks)**

OR

10 a. Explain the effect of harmonics on electrical equipment. **(10 Marks)**
    b. What are the assumptions of harmonic sources? Explain the current and voltage waveform harmonic source. **(10 Marks)**

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