CBCS SCHEME

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18EE735

Seventh Semester B.E. Degree Examination, Dec.2023/Jan.2024
Reactive Power Control in Electric Power Systems

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Explain briefly the three main objectives in load compensation. **(12 Marks)**

b. List the functions and properties of an ideal compensator. **(08 Marks)**

OR

2 a. Point out the requirements of load compensation. **(04 Marks)**

b. Examine fundamental theory of power factor correction in 1ϕ AC systems with suitable equations and phasor diagrams. **(10 Marks)**

c. Write note on classical load balancing problem of load compensation. **(06 Marks)**

Module-2

3 a. Analyse Surge Impedance loading and natural loading of a transmission line. **(06 Marks)**

b. Sketch the voltage and current profiles of uncompensated radial line on open circuit. Obtain the necessary equations. **(14 Marks)**

OR

4 a. Analyze the effect of line length, load power and power factor on voltage and reactive power of transmission line. **(12 Marks)**

b. Write note on uniformly distributed fixed compensation. **(08 Marks)**

Module-3

5 a. Discuss control of open circuit voltage with shunt reactors. **(08 Marks)**

b. Point out the objectives and practical limitation of series compensation. **(08 Marks)**

c. Write note on basics of capacitors. **(04 Marks)**

OR

6 a. Explain briefly power transfer characteristics and maximum transmissible power with respect to series compensation. **(12 Marks)**

b. Discuss fundamental concepts of compensation by sectioning. **(08 Marks)**

Module-4

7 a. What are static compensation? Mention the practical applications of it in electric power system. **(10 Marks)**

b. Explain principle of operation of Thyristor Controlled Reactor (TCR). **(10 Marks)**

OR

8 a. Discuss briefly series capacitor protection using protective gear and varistor protective gear. **(14 Marks)**

b. Write note on synchronous condenser. **(06 Marks)**

Module-5

9 a. What are harmonics? What are their effects on Electrical equipments? **(06 Marks)**

b. With a neat single line diagram, and equivalent circuit, explain resonance, shunt capacitor and filters with respect to harmonics. **(14 Marks)**

OR

10 a. Explain telephonic interference with respect to Telephone Interference factor. **(10 Marks)**

b. Write note on Reactive power management. **(05 Marks)**

c. Describe reactive power planning through Economic justification. **(05 Marks)**

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