USN | | | | | | | | | | **10EE831**

Eighth Semester B.E. Degree Examination, June/July 2017
Reactive Power Management

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions, selecting at least TWO questions from each part.*

PART – A

1   a. Briefly explain the importance of reactive power control in electric power systems.
        (06 Marks)
    b. Explain the objectives of load compensation.
        (08 Marks)
    c. List the parameters and factors needed to be considered when specifying a load
        compensation.
        (06 Marks)

2   a. Show that a pure reactive compensator can eliminate supply voltage variations caused by
        changes in both real and reactive power of the load.
        (08 Marks)
    b. Explain the fundamental requirements in AC power transmission.
        (08 Marks)
    c. Explain the uncompensated line under open circuit.
        (04 Marks)

3   a. Discuss the operations of symmetrical line at no load.
        (10 Marks)
    b. An uncompensated line is under load. Discuss the effect of line length, load power and load
        power factor on voltage and reactive power.
        (10 Marks)

4   a. Discuss the following :
            i) Effect of distributed compensation on voltage control.
            ii) Effect of distributed compensation on line charging reactive power.
        (10 Marks)
    b. Explain the following :
            i) Multiple shunt reactors along a long line
            ii) Voltage control by means of switched shunt compensation.
        (10 Marks)

PART – B

5   a. Obtain the power transfer characteristics of a symmetrical line with mid – point series
        capacitor and shunt reactor.
        (06 Marks)
    b. Explain compensation by sectioning.
        (06 Marks)
    c. Explain the working of a midpoint shunt compensator.
        (08 Marks)

6   a. With the help of circuit diagram and wave form, explain the working of Thyristor controlled
        reactors.
        (10 Marks)
    b. List he benefits of series compensations.
        (04 Marks)
    c. Discuss reinsertions schemes for series capacitors.
        (06 Marks)

7   a. Draw and explain the phasor diagram and V-curve of synchronous condenser.
        (06 Marks)
    b. Explain synchronous condenser operations in power systems voltage control.
        (06 Marks)
    c. Explain different methods of starting synchronous condensers.
        (08 Marks)

8   a. Discuss briefly the effects of harmonics on electrical equipment.
        (05 Marks)
    b. Define reactive power management. With the help of block diagrams, explain optimal power
        flow algorithm and system operation planning.
        (08 Marks)
    c. Discuss benefits of applying reactive power dispatching strategy to improve power system
        operations.
        (07 Marks)

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