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Seventh Semester B.E. Degree Examination, January/February 2006
Electrical & Electronics Engineering
Reactive Power Management (Elective)

Time: 3 hrs.)

(Max.Marks : 100)

Note: Answer any FIVE full questions.

1. (a) Discuss in brief on the following in electrical power systems :
 - i) Necessity for load compensation (10 Marks)
 - ii) Objectives of compensation (10 Marks)
- (b) With the help of a phasor diagram, explain power factor correction using a load compensator. (10 Marks)
2. (a) Discuss on the fundamental requirements of A.C. power transmission. (8 Marks)
- (b) Show that for an uncompensated line on load, the midpoint voltage is related to the reactive power supplied at the sending end. (12 Marks)
3. (a) Discuss on the voltage and current profiles of an uncompensated line on open circuit. (8 Marks)
- (b) Compare the following compensating units by their type and function when used in practical systems :
 - i) Surge impedance compensation
 - ii) Line - Length compensation
 - iii) Compensation by sectioning (12 Marks)
4. (a) Explain the four characteristic time periods of analysis following a system fault. (10 Marks)
- (b) Distinguish between active and passive compensation and mention the types of compensation that can be employed by these types of compensation. (10 Marks)
5. (a) Draw the required diagrams and explain the principle of i) Saturated reactor compensator and ii) TSC type of SVC. (12 Marks)
- (b) Compare the following types of compensators in terms of construction, reactive power capability, harmonics, and accuracy of compensation, when used in practical systems :
 - i) Synchronous condenser
 - ii) Thyristor switched capacitor
 - iii) Polyphase saturated reactor
 - iv) TCR's (8 Marks)

6. (a) Briefly explain the various reinsertion schemes of series capacitors. (8 Marks)
- (b) Discuss on the effects of harmonics on electrical equipment. Hence explain the role played by shunt capacitors and filters. (12 Marks)
7. (a) What are the methods of starting synchronous condensers? Explain. (10 Marks)
- (b) Discuss on the transmission benefits of reactive power management. (10 Marks)
8. Write explanatory note on the following (Any FOUR):
- (a) Surge Impedance loading
 - (b) Reactive power bias
 - (c) Current practices of reactive power dispatch
 - (d) Telephone interferences
 - (e) Phase balancing by load compensation
- (4 × 5 = 20 Marks)

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