

Code: EEPC1T4

I M.Tech-I Semester-Regular Examinations-April 2013

**REACTIVE POWER COMPENSATION AND
MANAGEMENT
(POWER SYSTEM CONTROL & AUTOMATION)**

Duration: 3 hours

Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. (a) Explain about the role of Load Compensation in Modern Power Systems and its importance in real time power systems? 7 M
- (b) What is Phase Balancing and explain why power factor correction is to be used for unsymmetrical loads with suitable examples. 7 M
2. (a) Derive the condition for maximum power transfer for an uncompensated line under load and discuss about the stability considerations 7 M
- (b) Explain in detail about the types of compensations. 7 M

3. (a) Explain the effect of TCR during voltage depression and voltage raise at the receiving end of a symmetrical system. 7 M
- (b) Explain how a synchronous condenser can work as a shunt compensators for a symmetrical line along with its response characteristics. 7 M
4. (a) Explain the objectives of reactive power co-ordination. What are its transmission benefits? What is the role of reactive compensation in maintaining quality of power supply. 7 M
- (b) What are the causes and effects of under voltages and radio frequencies and electromagnetic interferences in reactive power co-ordination? 7 M
5. (a) What are the basic methods of load shaping in demand side management. List out and explain them in brief. 7 M
- (b) Explain the causes for voltage flickering and harmonic voltage levels and how these are analyzed based on tariff. 7 M
6. (a) Explain the causes for system losses and what are the most commonly used reduction methods from the distribution side. 7 M

- (b) What are the objectives of reactive power planning in capacitor placements. 7 M
7. (a) Explain the purpose of using capacitor in managing the reactive power from user side and discuss about its advantages and dis-advantages. 7 M
- (b) What are the different types of capacitors available? List out the factors used in selecting the capacitors based on applications, explain. 7 M
8. (a) Explain briefly the reactive power control requirements in electric traction systems. Discuss its advantages & dis-advantages. 7 M
- (b) Explain the basic operation of Electric arc furnace and derive the expression for power factor of an arc furnace. 7 M