

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER M. TECH DEGREE EXAMINATION
Electrical and Electronics Engineering

B

04 EE 7415 – REACTIVE POWER COMPENSATION AND MANAGEMENT

Max. Marks: 60

Duration: 3 Hours

PART A

Answer All Questions

Each question carries 3 marks

1. Draw the reactive power characteristics of a partially compensated system with inductive load.
2. Discuss the reasons for Ferranti effect.
3. What are the functions of a compensation system
4. Explain the need for compensation in power system network.
5. What do you mean by Z_0 compensation?
6. What is the effect of electromagnetic interference in power system?
7. Write a note on reconfiguration of distribution networks?
8. Discuss the role of capacitors in power transmission.

PART B

Each question carries 6 marks

9. Prove that a pure reactive compensator cannot eliminate voltage regulation and PFC simultaneously.
OR
10. Explain the objectives of load compensation in a power system network.
11. Discuss the effect of line length, load power and power factor on voltage and reactive power.
OR
12. Derive fundamental transmission line equation with necessary explanations.
13. Explain the voltage control by means of switched shunt compensation with a suitable example
OR
14. A 400mi transmission line with per unit reactance of 0.8108 and total shunt capacitive susceptance of 0.8108 p.u. The series compensating capacitor is chosen so as to compensate 50% of the line reactance. If the surge impedance value is 250 ohms, then calculate the following:
 - a) Midpoint voltage without shunt reactor
 - b) Maximum power transferred with series compensation
 - c) Maximum power transferred without compensation
15. Discuss the transmission benefits of reactive power coordination.
OR
16. Discuss the mathematical modeling of reactive power management.
17. Describe the objectives of reactive power planning in distribution systems.
OR
18. Explain the methods used for reduction of losses in power systems.
19. Discuss the KVAR requirements for domestic appliances.
OR
20. Explain how capacitors can be placed economically.