

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER M. TECH DEGREE EXAMINATION

B

Electrical and Electronics Engineering

(Power Systems)

04EE 7415—Reactive Power Compensation and Management

Max. Marks : 60

Duration: 3 Hours

PART A

Answer All Questions

Each question carries 3 marks

1. Define voltage regulation.
2. List out the parameters that are needed to be considered while specifying a load compensator.
3. Write the expression for fundamental transmission line equation.
4. What are the objectives of series compensation?
5. What do you mean by compensation by sectioning.
6. Define harmonics. List the sources producing harmonics.
7. What do you mean by Reconfiguration of distribution networks.
8. What is Telephone Interference Factor?

PART B

Each question carries 6 marks

9. Explain the principle of power factor correction to compensate for the reactive power.
OR
10. A three-phase system has line-line voltage 11 kV and short circuit capacity of 480 MVA. With compensator gain of 100 pu, determine voltage sensitivity with and without compensator. For each case, if a load reactive power changes by 10 MVARs, find out the change in load bus voltage assuming linear relationship between V-Q characteristics. Also find relationship between compensator and load reactive powers.
11. Explain briefly surge impedance and natural loading of an uncompensated transmission line.
OR
12. Derive the expression for line voltage profile and current profile of an uncompensated line on open circuit. Draw the voltage and current profiles.
13. Explain Virtual- Z_o (Surge impedance compensation).
OR
14. Explain Virtual- θ (Line-length compensation).
15. Explain the various causes and effects of under voltages.
OR
16. Explain how Reactive Power Management is obtained by means of mathematical modeling.
17. What are the objectives of reactive power planning in distribution systems.
OR
18. Explain Reconfiguration methods and Optimizing power flows method used for reduction of losses in power systems.
19. Explain the deciding factors in selection of a capacitor
OR
20. Explain the purpose of using capacitors.