

2122
M.E. Electrical Engineering (Power System)
Third Semester
EE-8304a: Power Quality Problems and Mitigation

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt any five questions.

x-x-x

- Q1. A) What are the major power quality issues associated with the modern power system. (05)
Explain in detail.
- B) What are the different voltage sag mitigation techniques? Explain in details. (05)
- Q2. A) Define the following terms related with IEEE standards: (i) SCR (ii) load current (05)
(iii) short circuit current (iv) total harmonics distortion (v) total demand distortion
(vi) PCC.
- B) Explain power quality and explain the reasons for increased concern in power (05)
quality.
- Q3. A) What are the different sources of the transient over voltages? Discuss the capacitor (05)
switching transients.
- B) What are the limitations of the series compensation using lossless passive (05)
components?
- Q4. What is the need for protection against over voltages? What are the basic principles (10)
of over voltages protection of load equipments?
- Q5. A) What are the various lightning protection schemes used for over voltage lines? (05)
- B) Explain the problems associated with Ferro resonance. (05)
- Q6. A) Draw the standardized waveform of the lightning induced voltage. Discuss about (05)
the wave shape of the lightning current.
- B) Explain briefly about the phenomenon of how current distortion affects the voltage (05)
distortion under the presence of harmonics.
- Q7. A) What is the role of filters in power quality? Explain the selection, design procedure, (05)
operation and control strategy of a hybrid filter to improve the power quality of the
system.
- B) How DVRs protect sensitive loads from distortion in supply voltages? (05)
- Q8. What is a unified power quality compensator used for compensation in an AC (10)
distribution system? Write all power quality problems that a UPQC can mitigate?

x-x-x