

Code No: I4305/R16

M. Tech. I Semester Regular Examinations, January-2017

POWER QUALITY

[Common to Power Electronic (43),PI&D(42),PE & ED(54),PE & D (52),PE & S(12),EM & D(44) and Power Electronics & Power Systems (99)]

Time: 3 Hours

Max. Marks: 60

Answer any FIVE Questions
All Questions Carry Equal Marks

1. a What is the impact of transient on power quality? Classify the transients that occur in power systems. 6
b Explain about short-duration voltage variations. Compare short-duration voltage variations and long-duration voltage variations. 6
2. Explain the following in detail: 6
 - a) Voltage Unbalance
 - b) Waveform Distortion
 - c) Voltage fluctuationb Define voltage sag and voltage interruption. What is their impact on equipments connected? Discuss the sources of sags and interruptions. 6
3. Discuss the following source of transient over voltages: 4x3
 - a) Capacitor switching
 - b) Magnification of capacitor-switching transients
 - c) Lightning
 - d) Ferro resonance
4. a Describe how utilities can deal with problems related to capacitor-switching transients. 6
b Discuss briefly about 6
 - i. Utility System Lightning Protection
 - ii. Load Switching Transient Problems
5. a Explain about the controlling of harmonics using passive and active filters. How active filters overcome the drawbacks of passive filters in controlling of harmonics. 6
b Explain briefly about the phenomena of current distortion and the voltage distortion under the presence of harmonics. 6
6. a Explain the following: 7
 - i. Harmonic sources from commercial loads
 - ii. Harmonic sources from industrial loads.b Explain the significance of harmonic index. Explain the general harmonic indices used universally in analyzing harmonic distortion. 5

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7. a What is meant by voltage flicker. List some sources of flicker. Discuss the methods for mitigation of flicker. 6
b Discuss how the capacitors are used for voltage regulation in power systems in shunt and series configuration. 6
8. a Discuss main power quality issues which affect distributed generation. 6
b Explain the solutions to wiring and grounding problems due to interconnection of DG to improve power quality. 6
