

Code No: **R194202D**

R19

Set No. 1

IV B.Tech II Semester Regular Examinations, April– 2023

POWER QUALITY

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

*Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks*

UNIT I

- 1 a) Explain power quality and explain the reasons for increased concern over power quality. [7]
b) With a waveform sketch, explain the terms.
(i) Wave form distortion
(ii) Voltage interruption [8]
(OR)
- 2 a) Explain total harmonic distortion and total demand distortion. [7]
b) Explain the various types of power quality disturbances and their impacts on the power system. [8]

UNIT II

- 3 a) Explain the various causes and effects of voltage swells. [7]
b) Explain the following terms with appropriate waveforms and write IEEE specifications for each
i) Voltage sag
ii) Voltage Interruption
iii) Over Voltage [8]
iv) Voltage surge
(OR)
- 4 a) Discuss the sources of voltage sags and interruptions. [7]
b) What are the different sources of transient overvoltages? Discuss the capacitor-switching transient. [8]

UNIT III

- 5 a) Classify the principles of regulating the voltage. List the devices available for regulating the voltage in a power system. [7]
b) What is the significance of power factor and why is a power factor penalty levied? [8]



(OR)

- 6 a) Discuss the methods for regulating the utility voltage with distributed resources. [7]
b) Explain in detail the role of capacitors in voltage regulation. [8]

UNIT IV

- 7 a) Explain the step-by-step procedure to design harmonic filters. [7]
b) Explain the effects of harmonic distortion on (i) capacitors and (ii) motors. [8]

(OR)

- 8 a) Discuss various sources of harmonics in an electrical network. How are harmonics produced in a converter-controlled system? [7]
b) Discuss passive and active filtering to mitigate the harmonics. [8]

UNIT V

- 9 a) What are the main power quality issues affected by distributed generation? How can they be mitigated? [7]
b) What are the various instruments used for power quality measurements? What are the factors to be considered when selecting the instruments? [8]

(OR)

- 10 a) Discuss the following issues raised while interfacing the DG to the utility system:
(i) Flicker;
(ii) Harmonics [7]
b) Discuss in detail the instruments used for analyzing non-sinusoidal voltages and currents. [8]

