

M.Tech. Electrical Power System (CBCS Pattern) Semester - I
PEPS141 - Elective-I - Electrical Power Quality

P. Pages : 2

Time : Three Hours



GUG/S/23/10973

Max. Marks : 70

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- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answers wherever necessary with the help of neat sketches.
 5. Use of slide rule, Logarithmic tables, Steam tables, Mollier's chart, Drawing instruments, Thermodynamic tables for moist air, Psychrometric charts and Refrigeration charts is permitted.
 6. Answer **five** questions.

1. a) What are the main sources of power transient? Compare the phenomena of impulsive & oscillatory transients on time frame. 7
b) Define the following terms. 7
 - i) Voltage imbalance
 - ii) Waveform distortion
 - iii) Voltage sag
 - iv) Harmonics
 - v) Voltage fluctuations
2. a) Explain the impact of Non-linear load on Feeder lines on: 7
 - i) Capacitors
 - ii) Transformers
 - iii) Motors
 - iv) Telecommunicationb) What is reliability of power system. Describe following reliability indices. 7
 - i) SAIFI
 - ii) CAIFI
 - iii) SAIDI
 - iv) CAIDI
 - v) MAIFI
3. a) Discuss in detail about the instruments used for analyzing non sinusoidal voltage & currents. 7
b) Discuss the Spectrum Analysers and Harmonic Analysers. 7
4. a) What are the two important harmonic indices used in power system? Explain about it briefly. 7
b) Define voltage flicker. Discuss some of the flicker sources. Write notes on common methods for mitigating of flicker. 7
5. a) Explain the importance of transducers in monitoring of power quality in power system. 7

- b) Describe with neat sketch. Three phase static AC/DC converter. 7
6. a) What is voltage flicker? What are its causes and what is the impact of flicker on the various power system components. 7
- b) Discuss the classical load balancing problem. 7
7. a) Write algorithm for line extraction of fundamental sequence components from measured samples. 7
- b) Write short note on Network Reconfiguring Devices. 7
8. a) What is Dynamic Voltage Restorer (DVR) Describe its functioning for protecting the sensitive load. 7
- b) Explain the following events based on disturbances 7
- i) Dip ii) Swell iii) Transients
