Roll No .....

MEPE - 205

M.E./M.Tech., II Semester

Examination, June 2016

Power Quality and Conditioning

Time : Three Hours

Maximum Marks : 70

Note : Attempt any five questions. All questions carry equal marks.

1. a) Explain the concept of voltage fluctuation in Power supply. Draw the waveform of three-phase supply showing the balanced and unbalanced loads.
   b) What is Power Quality? Discuss the parameters that define the quality of electrical power. Explain the term "Good Power Quality".

2. a) Define harmonics. What are different types of harmonics? Explain the different detrimental effects of harmonics with suitable examples.
   b) Explain briefly about the phenomena of current and voltage distortions under the presence of harmonics.

3. a) Explain in detail about classification of linear and nonlinear loads used in harmonic studies.
   b) What are the passive filters? Explain the factors to be considered for designing passive filters. Also explain their limitations.

4. a) Discuss the common problems and their solutions related to power quality in wiring and grounding of electrical systems.
   b) What are the objectives of standardization of Power Quality phenomena? State and explain important standard used to define and classify power quality disturbances.

5. a) Compare constant tolerance band and variable tolerance band used in active shaping of input line current with improved power quality converters .
   b) What do you understand by active frequency control technique for active wave shaping of input line current?

6. a) How harmonics are generated due to imbalance of three-phase currents in a distribution transformer? How these harmonics are eliminated?
   b) Explain the principle of series compensation. Mention its merits and demerits with respect to shunt compensation.

7. a) Describe the different standard test waveforms and explain the parameters used to characterize them.
   b) Explain the different types of hybrid filter connections. What are the reasons of their popularity?

8. a) What is the ideal criterion of harmonics filter designing? Explain the important factors used to calculate the size of a distribution harmonic filter.
   b) Explain the effect of Electromagnetic Interference (EMI) in power quality and how it can be minimized.

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