MEPE - 205

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

Examination, July 2015

Power Quality And Conditioning

Time : Three Hours ***Maximum Marks : 70***

Note : Attempt any five questions. Each question carry equal marks. Assume suitable data if required.

1. a) Define the following:
   i) Define power quality.
   ii) What are the power quality issues?
   iii) State the causes of sag and swells.
   iv) List out the IEEE and IEC standards.
   b) Explain the various types of power quality disturbances and impacts of power quality.

2. a) i) Explain the power system response characteristics under the presence of harmonics.
   ii) What is the need of locating harmonic sources?
   b) Explain briefly about the phenomena of current distortion and the voltage distortion under the presence of harmonics.

3. a) Explain briefly about fundamentals of harmonics generation and waveform distortion.
   b) Explain in detail about classification of linear loads and non linear loads used in harmonic studies.

4. a) List the various effects of equipments due to harmonics. Explain briefly.
   b) What are the various classifications of harmonic sources and explain briefly about it.

5. a) Explain different topologies of suppression for harmonics using active filters.
   b) Explain the drawbacks of passive filters of suppression for harmonics in power conditioning.

6. a) Explain the effect of electromagnetic interference in power quality and how it can be minimized.
   b) Compare constant tolerance band and variable tolerance band control used in active shaping of input line current with improved power quality converters.

7. a) What do you understand by active frequency control technique for active wave shaping of input line current?
   b) Explain constant frequency control technique for active wave shaping of input line current.

8. Write short notes on any two of the following:
   i) FFT (or) digital technique used for harmonic analysis.
   ii) Total harmonics distortions.
   iii) Electromagnetic interference.
   iv) Power conditioning equipment.

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