

MEPE-205

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

Examination, June 2013

Power Quality and Conditioning

Time : Three Hours

Maximum Marks : 70

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

1. a) What do you mean by power quality of an electrical network?
- b) Discuss various types of power quality disturbances in detail.

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2. a) Discuss various power quality indices based on which assessment of an electrical network can be performed.
- b) Explain causes, effects and remedial measures to be taken for different power quality disturbances.

3. a) Discuss various sources of harmonics in an electrical network. How harmonics are generated in converter controlled system?
- b) Explain & compare different converter configurations in terms of their contribution to supply harmonics.

4. a) Discuss various standards of supply harmonics & radio interference in converter controlled network.
- b) Explain classical solution of harmonics elimination/reduction techniques. In detail with suitable diagram.

5. a) Explain a 3-phase Improved power quality converter topology with its control technique, in detail, with waveforms.
- b) Explain, step by step, design of harmonic filters.

6. a) Discuss various topologies & control techniques of active power filters, in brief.
- b) Differentiate between voltage source active filter and current source active filter.

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7. a) What is electromagnetic interference (EMI)? Give sources of EMI generation. Enumerate various EMI standards.
- b) Discuss various techniques/measures for EMI suppression/elimination.

8. Write short note on any two:

- a) Single-phase Improved power quality converter
- b) Variable tolerance band control for active wave shaping.
- c) Harmonic elimination using different transformer connection.