

Roll No .....

**MEPS - 203**

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

Examination, June 2016

**Power Quality And Conditioning**

*Time : Three Hours*

*Maximum Marks : 70*

- Note :** i) Attempt any five questions.  
ii) All questions carry equal marks.

1. a) Define power quality. Explain the reasons for increased concern in power quality.  
b) What are the major power quality issues? Explain in detail.
2. 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.
3. a) What are the general causes of harmonics in power systems?  
b) What is the need of locating harmonic sources? Explain.
4. a) Explain the various types of power quality disturbances and its impact on power quality.  
b) Explain briefly about international standards of power quality.

5. A single phase Shunt Active Power Filter (SAPF) is employed for harmonics currents and reactive power compensation for a single phase 220V, 50Hz system. It has a thyristor bridge converter drawing 25A constant dc current operating at 30° firing angle of its thyristors. Calculate the current, voltage rating of the SAPF to provide
  - i) Only harmonic compensation
  - ii) Harmonic and reactive power compensation at unity power factorLet the supply is stiff enough so that the distortion in voltage at point of common coupling is negligible.

6. a) Describe the operation of PWM converter as a voltage source active filter with a neat circuit diagram.  
b) Draw and explain in brief the improved power quality converter topologies.
7. a) Describe the variable tolerance band control technique for active wave shaping of input line current.  
b) Discuss the electromagnetic interference standards and techniques to eliminate it.
8. Write short notes on any two of the following:
  - a) EMI generation
  - b) Classical solutions of harmonics
  - c) Buck-boost bidirectional three phase improved power quality converter
  - d) Hybrid of passive shunt and active series filter for power quality improvement in single phase ac system.

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