Total No. of Questions :7] *[Total No. of Printed Pages :2*

 Roll No .....

MEPE-205

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

Examination, June 2017

Power Quality And Conditioning

Time : Three Hours

Maximum Marks : 70

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

1. a) Explain the impact of power quality on utility and consumer. 7
   b) Discuss the following electrical power quality issues with examples. 7
      i) Voltage swell
      ii) Voltage interruption.

2. a) Define harmonics. Explain why even harmonics are normally absent in the power conditioners. 7
   b) What are the various causes of harmonics in supply system and illustrate their effects. 7

3. A single phase uncontrolled full bridge rectifier is connected to a balance 50Hz single phase 230V AC supply. All elements are ideal and assume load inductance is large such that the load current is essentially constant. Sketch the 14
   i) Supply voltage waveform
   ii) Determine the DC output voltage.
   iii) Sketch the supply current waveform.

   iv) Find the Fourier series of supply current.
   v) Find the distortion factor, displacement factor power factor and line current THD.

4. a) Draw following circuits of 7
      i) Passive series filters
      ii) Passive hybrid filter
      iii) Active series filter for power quality improvements in single phase AC systems.
   b) Discuss basic principle of operation of shunt active filters. 7

5. a) What is radio-interference? Define its causes. 7
   b) A single phase load $z = (3 + j4)\Omega$ has an input AC voltage of 230V, 50Hz supply. It is to be realized as unity power factor load on AC supply using shunt connected lossless passive elements (L and C) calculate the value of compensator elements. 7

6. a) What are the causes of conducted electromagnetic interference and how it can be minimized? 7
   b) Discuss the advantages of hybrid filters. 7

7. Write short notes (any two) : 2×7=14
   a) Power quality indices.
   b) IEEE S19-1992 Standards
   c) FFT
   d) Power conditioning equipment.

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