Hall Ticket No | | | | | | | | | | | Question Paper Code: BPE210

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

M.Tech II Semester End Examinations (Regular) - July, 2017

Regulation: IARE–R16

POWER QUALITY

(Power Electronics and Electrical Drives)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Explain various power quality problems and their causes? **[7M]**
   (b) Explain the effect of DC offset current in a distribution network? **[7M]**
2. (a) Describe various power quality standards of IEC and IEEE? **[7M]**
   (b) Define the following power quality problems: **[7M]**
      i. Transient
      ii. Total Harmonic Distortion and write the expression of current THD
      iii. Power frequency variations

UNIT – II

3. (a) Explain the contribution following Industrial non-linear loads to power quality issues. **[7M]**
      i. Three-Phase power converters
      ii. Arcing devices
   (b) Explain voltage fed type of non-linear loads? **[7M]**
4. (a) What are the various classifications of AC/DC converter type non-linear loads? **[7M]**
   (b) Describe various power quality problems caused by Non-linear loads? **[7M]**

UNIT – III

5. (a) Explain the Walsh transform technique for analysis of power quality measurement? **[7M]**
   (b) Discuss the merits and demerits of using Fourier and wavelet transforms in power quality analysis? **[7M]**
6. (a) Explain the Hartley transform technique for analysis of power quality measurement? **[7M]**
   (b) Write in brief the historical perspective of power quality measuring instruments? **[7M]**

UNIT – IV

7. (a) Define any three reliability indices for the response of the system to the power outages? **[7M]**

   (b) Describe the procedure for online extraction of fundamental sequential components from measured samples? **[7M]**

8. (a) What is voltage flicker and its causes? Also draw a waveform - graph of the voltage flicker due to time varying, non-linear loads? **[7M]**

   (b) Explain the effect of Voltage Sag on customers due to: **[7M]**

      i. Different Source impedance topology

      ii. Single line to ground fault in distribution system

UNIT – V

9. (a) What is meant by Custom Power Device (CPD) and list out the different types of CPD's? **[7M]**

   (b) Explain how a sensitive load will be protected by a DVR with a neat schematic diagram? **[7M]**

10. (a) Briefly describe the following with schematic diagram: **[7M]**

      i. Solid State Current limiter

      ii. Static Transfer Switch

   (b) Describe the status of application of custom power devices? **[7M]**

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