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Total Number of Pages: 02

**M.TECH**  
**PEPE202**

**2<sup>nd</sup> Semester Back Examination 2016-17**

**POWER QUALITY**

**BRANCH: POWER ELECTRONIC, POWER ELECTRONIC & DRIVES, POWER ELECTRONIC AND ELECTRICAL DRIVES**

**Time: 3 Hours**

**Max Marks: 70**

**Q.CODE:Z1086**

**Answer Question No.1 which is compulsory and any FIVE from the rest. The figures in the right hand margin indicate marks.**

- Q1 Answer the following questions: *Short answer type* (2 x 10)**
- a) What do you mean by power conditioning, Why it is necessary.
  - b) What is electrostatic discharge and how it effectson electronic equipment.
  - c) What do you mean by power quality interdependence? Explain.
  - d) What are three levels of possible solutions to voltage sag and momentary interruption problems?
  - e) What are the components of flicker meter?
  - f) Define active series compensation devices.
  - g) What is the need of low pass filter in transient protection?
  - h) Mention at least two causes of harmonics.
  - i) A 2000-kVAR, 13.8-kV, Y-connected capacitor bank is connected at the end of a 25-mile transmission line with an inductive reactance of 0.5  $\Omega$  per mile. Find the natural frequency of the current that would be drawn during turn on
  - j) Mention the need of SVC. bput question papers visit <http://www.bputonline.com>
- Q2**
- a) Explain causes of voltage and current harmonics (5)
  - b) Discuss in detail about the sag performance evaluation indices. (5)
- Q3**
- a) Discuss various motor starting methods. How is it causing power quality problems. (5)
  - b) Explain how cable shielding minimizes electromagnetic interference. (5)
- Q4**
- a) Explain the concept of harmonic phenomena under the presence of harmonic producing loads. (6)
  - b) Explain in brief what is equipment immunity. (4)
- Q5**
- a) Explain the role of active power filters in power quality improvement. (5)
  - b) What are the various causes of harmonics in distribution power system. (5)

- Q6** Explain the following causes of sags **(10)**
- i) Voltage sag due to motor starting
  - ii) Voltage sag due to single line to ground fault
  - iii) Voltage sag due to transformer energizing
- Q7** a) Explain the role of isolation transformer in reducing low frequency disturbances. **(5)**
- b) Explain in detail about various methods to mitigate voltage swells **(5)**
- Q8** Write short notes on any two **(5x2)**
- i) Series voltage controller
  - ii) Harmonic Distortion
  - iii) Transient disturbance analyzers