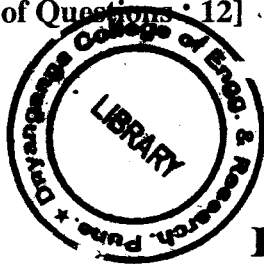


May - June - 2012

Total No. of Questions : 12]

P1378

SEAT No. : 

[Total No. of Pages : 3

**[4164] - 505**  
**B.E. (Electrical)**  
**POWER QUALITY**

**(2008 Pattern) (Elective - I) (Sem. - I)**

Time : 3 Hours]

[Max. Marks :100

Instructions to the candidates:

- 1) In Section - I, attempt Q1 or Q2, Q3 or Q4, Q5 or Q6. In Section - II attempt Q7 or Q8, Q9 or Q10, Q11 or Q12.
- 2) Answers to the two sections should be written in separate answer books.
- 3) Figures to the right indicate full marks.
- 4) Neat diagrams must be drawn wherever necessary.
- 5) Use of non-programmable electronic pocket calculator is allowed.
- 6) Assume suitable data, if necessary.

**SECTION - I**

- Q1) a)** Define and explain the following terms as per IEEE Std. 1159, such as
- i) Short duration voltage variations
  - ii) Voltage swells
  - iii) Voltage flicker
  - iv) Voltage sags and
  - v) Voltage interruptions. [10]
- b) Explain various grounding practices as per IEEE standard. [8]

OR

- Q2) a)** Explain various definitions of power quality with reference to each stake holders and why power quality is gaining important now a day? [10]
- b) Define with graphical representation various RMS voltage variations as per IEEE std. 1159-1995. [8]
- Q3) a)** Explain impact of reactive power management on voltage profile. What are the causes of undervoltages? [8]
- b) Explain the following terms related with voltage flicker : [8]
- i) Short term ( $P_{st}$ ) and
  - ii) Long term ( $P_{lt}$ ) voltage flicker.

**P.T.O.**

OR

- Q4) a)** What are the causes of overvoltages? Explain various mitigation measures, [8]
- b)** Explain RMS voltage variation and complex power concept in the power systems. [8]
- Q5) a)** Explain voltage sag characteristics such as magnitude, phase angle jump, point on wave initiation and point on wave recovery. [8]
- b)** Explain influence of fault location and fault level on voltage sags. [8]

OR

- Q6) a)** Explain various utility mitigation measures for voltage sags? [8]
- b)** Explain economic impact of voltage sag and its consequences. [8]

**SECTION - II**

- Q7) a)** Explain in detail stepwise procedure of IEEE 519-1992 for harmonic analysis. [8]
- b)** Explain various harmonics mitigation methods. [10]

OR

- Q8) a)** What is harmonic filtering? Explain various detuned filters. [8]
- b)** What are harmonic resonances? Explain consequences of harmonic resonances. [10]
- Q9) a)** Explain capacitor switching transient and magnification of capacitor switching transient. [8]
- b)** Explain basic principles of over voltage protection. Which are the devices used for over voltage protection? [8]

OR

- Q10) a)** What are transients? Explain transient velocity, surge impedance and the effect of line terminations. [10]
- b)** Explain mitigation methods of impulsive transients. [6]

- Q11)a)** What are the different approaches followed in power quality monitoring? [8]
- b) Explain procedure for selection of monitoring equipments and use of various equipments required for power quality monitoring. [8]

OR

- Q12)a)** Explain selection procedure of transducers for power quality monitoring. [8]
- b) What are the requirements of power quality monitor to monitor various power quality parameters and various techniques of data collection?[8]



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