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.

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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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