

Total No. of Questions : 10]

SEAT No. :

**P1990**

[Total No. of Pages : 2

**[5059]-585**

**B.E. (Electrical) (Semester - I)**

**POWER QUALITY**

**(2012 Pattern) (Elective - I)**

*Time : 2.30 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicates full marks.*
- 4) *Use of Calculator is allowed.*
- 5) *Assume Suitable data if necessary.*

**Q1)** a) Define power quality issues like voltage variations, voltage imbalance and voltage flicker. **[5]**

b) State and explain the relationship between immunity, emission and compatibility. **[5]**

OR

**Q2)** a) Explain various grounding practices as per IEEE standards. **[5]**

b) Explain over voltage mitigation techniques. **[5]**

**Q3)** a) Define sag? Explain any two voltage sag mitigation methods. **[5]**

b) What are the various sources of transient overvoltages? **[5]**

OR

**Q4)** a) Explain area of vulnerability concept related with voltage sag. **[5]**

b) Define flicker? What are the various sources of voltage flickers? **[5]**

**Q5)** a) What are the various sources of harmonics and their effects on the operation of various power system equipments? **[9]**

b) Explain the following terms related with waveform distortion **[9]**

- |                   |                       |
|-------------------|-----------------------|
| i) Harmonics      | ii) Interharmonics    |
| iii) Subharmonics | iv) Triplen harmonics |

**P.T.O.**

OR

- Q6)** a) What are different harmonic indices used? Explain their use. [9]  
b) Explain power system quantities like active power, reactive power, displacement and true power factor under non-sinusoidal conditions. [9]

- Q7)** a) Discuss Concept of point of common coupling and its significance. [8]  
b) Explain various computer tools used for harmonics analysis. [8]

OR

- Q8)** a) Explain passive filter design procedure for harmonic reduction. [8]  
b) Explain in detail different principles of controlling harmonics. [8]

- Q9)** a) What are the requirements of power quality monitor to monitor various power quality parameters? Explain power quality analyzer used for PQ measurements. [10]  
b) Write note on choosing PQ monitoring location and its duration. [6]

OR

- Q10)** a) Explain instrument setup and various guidelines to be followed for monitoring power quality. [10]  
b) Explain the role of oscilloscopes, data loggers in PQ measurements. [6]

