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**Question Paper Code : X60484**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020  
Eighth Semester  
Electrical and Electronics Engineering  
EE2028/EE801 – POWER QUALITY  
(Regulations 2008)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. Define sag.
2. Find the total harmonic distortion of a voltage waveform with the following harmonic frequency make up : fundamental = 114 V, 3<sup>rd</sup> harmonic = 4 V, 5<sup>th</sup> harmonic = 2V, 7<sup>th</sup> harmonic = 1.5 V and 9<sup>th</sup> harmonic = 1V.
3. What are the causes of frequency variations ?
4. What is the importance of voltage sag estimation ?
5. What are the causes for oscillatory voltage transients ?
6. Define ferro resonance.
7. Write the sources of current harmonics.
8. Define Total harmonic distortion.
9. What are the steps involved in power quality monitoring ?
10. Mention any two signal processing tools for analyzing power quality issues.

**PART – B****(5×16=80 Marks)**

11. a) i) What are the major power quality issues ? Explain in detail. **(8)**  
ii) Define power quality. Explain the reasons for increased concern in power quality. **(8)**

(OR)

- b) i) Discuss in detail about the Computer Business Equipment Manufactures Associations (CBEMA) curve. **(8)**  
ii) Explain briefly about international standards of power quality. **(8)**

12. a) Describe the methodology of estimating voltage sag performance.

(OR)

- b) Briefly explain any two voltage sag mitigation techniques with necessary circuit diagram and waveforms.

13. a) i) What are the different sources of transient over voltages ? Discuss the capacitor switching transient. **(10)**  
ii) Explain the phenomena of Ferroresonance. **(6)**

(OR)

- b) i) Define lightning. Discuss in detail about the over voltages due to lightning and the problems associated with it. **(8)**  
ii) What are the advantages of computer analysis tools ? Discuss about PSCAD and EMTP for transient studies. **(8)**

14. a) Explain the waveform distortion due to different types of non linear loads.

(OR)

- b) i) Write short note on THD and TDD. **(4)**  
ii) Discuss the effect of harmonic distortion on transformers and motors. **(12)**

15. a) Illustrate the importance of power quality monitoring .

(OR)

- b) Enlighten the role of some of the power quality measuring instruments.
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