APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER M.TECH DEGREE EXAMINATION
Electrical and Electronics Engineering

04EE6407- POWER QUALITY

Max Marks: 60   TIME: 3 Hours

PART A

Answer All Questions   **8 x 3 = 24**

Each question carries 3 marks

1. Define power quality. Why power quality has become an issue in recent years?
2. Explain IEEE standard corresponding to harmonics.
3. Derive an expression for RMS value of harmonic current.
4. How transformers affect power system problems?
5. What is passive compensation? Explain
6. Explain how power factor can be improved using STATCOM.
7. What are the main requirements of NEC grounding?
8. What are the contributions of UPS for lower quality in power supply?

PART B

9. A 4.16 kV 60 Hz distribution system bus is selected to supply a 3 phase 4.5MVA purely resistive load. The spectral measurement indicates that the third harmonic voltage is 75V and fifth harmonic voltage is 177V. Find (a) THD (b) TIF (c) C message weight. Given C message factor for 60Hz=0.5, for 180Hz=30, for 300Hz=225.   **(6)**

OR

10. Explain about the short duration and long duration voltage variation.   **(6)**

11. Draw and explain CBEMA and ITI curves.   **(6)**

OR

12. What is meant by international power quality standards? Where are they used? Explain IEEE standard corresponding to sag and swell.   **(6)**

13. Describe what are the few equipment which contributes to harmonics in the utility.   **(6)**

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14	How does voltage sag affect different equipments in industries and protective switchgears?	**(6)**
15	Explain the modeling of power system under non-sinusoidal conditions?	**(6)**

OR

16	Explain the power quality problems created by drives and its impact on it?	**(6)**
17	Explain 3-phase APFC and its control techniques?	**(6)**

OR

18	What are the different types of passive filters used for harmonic elimination?	**(6)**
19	Explain in detail about principles of operation and control methods of series active filter with neat schematic.	**(6)**

OR

20	Define dynamic voltage restorer. What is the important role of DVR harmonic elimination?	**(6)**

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