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Total number of printed pages – 2

B. Tech
PEEL 5403

Eighth Semester Regular Examination – 2015

ELECTRICAL POWER QUALITY

BRANCH : EEE

QUESTION CODE : J 172

Full Marks – 70

Time : 3 Hours



*Answer Question No. 1 which is compulsory and any five from the rest.
The figures in the right-hand margin indicate marks.*

1. Answer the following questions :

2 × 10

- (a) What is a transient and Distinguish between impulsive transient and oscillatory transient ?
- (b) Differentiate between harmonics and transients ?
- (c) What is Voltage flicker and how it is monitored ?
- (d) What is the importance of estimating sag performance ?
- (e) What are the various utility system lightning protection ?
- (f) Define Total harmonic distortion and mention the formula used to calculate THD.
- (g) What is shielding ? Why it is used ?
- (h) Write down two analog instruments used for power Quality measurement.
- (i) What are the applications of active filters ?
- (j) What are the requirements of monitoring for a harmonic distortion ?

P.T.O.

2. (a) What do you understand by voltage sag ? Describe various causes for voltage sag and interruptions. 5
- (b) What do you mean Ferro resonance ? Explain how the ferro-resonant transformer can be used to curb the voltage sag. 5
3. (a) Explain the term "Area of vulnerability". What is its importance pertaining to power Quality ? 5
- (b) Explain the various sources of transient over voltages. 5
4. (a) Describe the capacitor switching operation and related waveforms. 5
- (b) Define lightning. Discuss in detail about the overvoltages due to lightning and the problems associated with it. 5
5. (a) Explain various methods for harmonic reduction. Also discuss its benefits and concerns. 5
- (b) Why power factor correction is required and also explain the possible techniques ? 5
6. (a) Discuss some of the flicker sources and methods for mitigation of flicker ? 5
- (b) What is the function of a disturbance analyzer ? Discuss briefly. 5
7. (a) Explain the principle of Kalman Filters for harmonic elimination. Write down the disadvantages of Kalman Filter. 5
- (b) Draw the block diagram of advanced power quality monitoring system and explain. 5
8. Answer any **two** of the following : 5x2
- (a) CBEMA Curves and its uses
- (b) Dynamic Voltage restorer
- (c) Power Conditioner.

