(Following Paper ID and Roll No. to be filled in your Answer Books)

PAPER ID : MI3

Roll No. | | | | | | | | | | |

M. TECH. (Sem.II)

THEORY EXAMINATION 2015-16

ELECTRICAL POWER QUALITY

Time : **3** Hours Total Marks : **100**

Note : Attempt all questions.

1. Attempt all of the following questions : (2×10=20)
   (a) What is harmonic distortion?
   (b) What are the reasons of low power factor? Also write the methods for improving the power factor.
   (c) Discuss how can harmonic current be mitigated.
   (d) Explain Unified power quality conditioner (UPQC).
   (e) Explain the term Individual harmonic distortion.
   (f) Enlist the various types of uninterruptible power supplies (UPS).
   (g) What is ferro-resistant transformer?
   (h) Discuss common power frequency disturbance.
   (i) Discuss standard test waveform.
   (j) Enlist the applications of power conditioners.

2. Answer any two questions of the followings : (10×2=20)

(a) Explain power quality. Discuss electrical power quality standards. Also, discuss poor power quality issues.

(b) Explain the Total Harmonic Distortion (THD). What is the difference between harmonics and distortion?

(c) What is voltage sag and swell? What are the reasons for under and over voltages?

3. Answer any two questions of the followings : (10×2=20)

(a) What are the causes and effects of outage? Discuss the measures to be taken to minimize the frequency and duration of outages in power distribution networks.

(b) What is bleeder resistor? What are the causes and effects of voltage imbalances and phase angle imbalances in power system?

(c) What are the voltage regulators? Also, discuss emergency and standby power systems.

4. Answer any two questions of the followings : (10×2=20)

(a) What measures should be taken to minimize the voltage disturbances. Discuss various PQ disturbances and their effects & causes.

(b) Describe the operation of transient disturbance analyzer. Also discuss the power distribution system design.

(c) Write short note on any three of the followings:

(i) Electrical Noise

(ii) Frequency deviation monitoring

(iii) Harmonic filters

(iv) Impulsive Transient

5. Answer any two questions of the followings : (10×2= 20)

(a) Discuss data logger. Discuss various types of data chart recorders with suitable diagram.

(b) Discuss various stages in power quality analysis with proper block diagram.

(c) What is switched mode power supply? Discuss working of an online UPS with block diagram.

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