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May-26-0410

EE-702 (Electrical Power Quality)

B.Tech. 7th (CBCS)

Time : 3 Hours **Max. Marks : 60**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, selecting one question each from section A, B, C and D. Section E is compulsory.

SECTION - A

1. Explain the characteristics of power frequency disturbances and their impact on electrical equipment. (10)

2. With neat diagrams, explain how isolation transformers and shielded isolation transformers help in reducing low-frequency disturbances. (10)

SECTION - B

3. Describe various methods of power factor improvement and their practical applications. (10)

4. Compare the use of synchronous condensers and static VAR compensators in power factor correction. (10)

SECTION - C

5. Describe the working principle and applications of harmonic analyzers. (10)

6. Compare the functions of data loggers, chart recorders, and true RMS meters in power quality monitoring. (10)

SECTION - D

7. With diagrams, explain earth resistance tests and their importance in grounding systems. (10)

8. Explain common grounding anomalies with case examples such as ground loops and stray currents. (10)

SECTION - E (Compulsory)

9. Attempt all questions:

   (a) Define power frequency disturbance.

   (b) State two methods of power factor improvement.

   (c) What is the typical power factor limit set by utilities to avoid penalty?

   (d) Name the instruments used for harmonic analysis.

   (e) What is the function of a transient-disturbance analyzer?

   (f) State the guidelines for instrument setup.

   (g) State the hazards prevented by proper grounding.

   (h) Mention any three types of ground electrodes.

   (i) Write function of a signal reference ground (SRG).

   (j) What is the role of a ground ring in a grounding system? (10×2=20)