

Printed Pages : 3



EEE061

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

**PAPER ID : 120852**

Roll No.

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### B. Tech.

(SEM. VIII) THEORY EXAMINATION, 2014-15  
**POWER QUALITY**

Time : 3 Hours]

[Total Marks : 100

Note : Attempt all questions.

- 1 Attempt any four parts of the following : **5×4=20**
- What is Power Quality ? Discuss the parameters that define the quality of electrical power. Explain the term "Good Power Quality".
  - What would be the impact of "poor power quality" on system efficiency, reliability and operation ?
  - What are the objectives of standardization of Power Quality phenomena ? State and explain important standard used to define and classify power quality disturbances.
  - How voltage sags are caused by large motor starting ?
  - Distinguish between voltage flicker and voltage fluctuations. What are the main reasons of these problems ?

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- (f) What do you understand by linear and nonlinear loads ?  
Compare them with suitable examples.

**2** Attempt any four parts of the following : **5×4=20**

- (a) What is transient disturbance ? How many types of transients are present ? Discuss each type by giving suitable examples.
- (b) Explain the phenomena of voltage magnification at customer side due to energizing capacitor on utility system and discuss the remedy.
- (c) What are the advantages and disadvantages of using capacitor bank in a power system ? With neat diagram explain the capacitor switching operation.
- (d) How ferro-resonant transformer can be used to handle voltage sag conditions ? Explain in detail.
- (e) What types of instruments are used for monitoring power quality ? Describe the applications of oscilloscope and spectrum analyzer for power quality monitoring.
- (f) Explain the various strategies for utilities to decrease the impact of lightning.

**3** Attempt any two parts of the following : **10×2=20**

- (a) Discuss the working principle of DSTATCOM. How load compensation can be done using DSTATCOM.
- (b) Explain the working of an on-line UPS with a detailed diagram. Also point out its superiority over off-line UPS.
- (c) What are series and shunt compensator ? Compare their role for power quality improvement.

- 4 Attempt any two parts of the following : **10×2=20**
- (a) What are the passive filters ? Explain the factors to be considered for designing a passive filters. Also explain their limitations.
  - (b) Explain the different types of hybrid filter connections. What are the reasons of their popularity ?
  - (c) What do you understand by harmonics ? What are different types of harmonics ? Explain the different detrimental effects of harmonics with suitable examples.
- 5 Attempt any two parts of the following : **10×2=20**
- (a) Discuss the common problems and their solutions related to power quality in wiring and grounding of electrical systems.
  - (b) What are Power Conditioners ? Explain working principle of Unified Power Quality Conditioner (UPQC) ?
  - (c) Distinguish between voltage sag and undervoltage ? Briefly discuss the techniques used for sag or dip mitigation.
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