

Code: 9A02801

B.Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

PRINCIPLES OF POWER QUALITY

(Electrical & Electronics Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks.

- 1 (a) What is power quality? And explain the significance of power quality.
(b) Draw and explain CBEMA and ITI curves.
- 2 (a) Write a short note on estimating the sag severity during full voltage starting.
(b) What are the fundamental principles of protections? Explain.
- 3 Explain about various sources of transient over voltages.
- 4 (a) Write the impact of voltage distortion on current distortion.
(b) Explain the commonly used indices for measuring the harmonic content in the waveform.
- 5 Explain the principles of controlling harmonics.
- 6 Explain in detail the role of capacitors for voltage regulation.
- 7 Explain various power quality contracts in detail.
- 8 (a) Write a short note on power quality monitoring standards.
(b) Explain about any one power quality measurement equipment.

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Answer any FIVE questions.
All questions carry equal marks.

- 1 (a) What is power quality and what is voltage quality? Explain how the power quality is equal to voltage quality.
(b) Explain about power quality evaluation procedure.
- 2 Explain about the procedural steps involved in the estimation of voltage sag performance.
- 3 (a) What are the fundamental principles of over voltage protection of load equipment? Explain.
(b) Explain how the Isolation transformers and low pass filters are useful for over voltage protection.
- 4 What are the various harmonic sources from industrial loads? Explain.
- 5 Explain the various devices for controlling harmonic distortion.
- 6 (a) Explain the concept of feeder voltage rise due to shunt capacitors.
(b) Explain the working of any one device for voltage regulation.
- 7 Explain the various power quality indices for assessing the quality of service with respect to harmonic voltage distortion.
- 8 (a) Write a short note on historical perspective of power quality measuring equipment.
(b) Explain the various power quality monitoring considerations.

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Answer any FIVE questions.
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- 1 (a) Explain about long-duration voltage variations.
(b) Write a short note on (i) Oscillatory transients (ii) Waveform distortion.
- 2 (a) Explain about sources of sags and interruptions.
(b) Write a short note on over current coordination principles.
- 3 Describe how utilities can deal with problems related to capacitor switching transients.
- 4 Explain the concept of power system qualities under nonsinusoidal conditions.
- 5 (a) Write a short note on effects of harmonics.
(b) Explain the harmonic distortion evaluation procedure.
- 6 (a) Explain the concept of feeder voltage rise due to series capacitors.
(b) Explain the effect of line drop compensation on voltage profile.
- 7 Describe various RMS voltage variation indices.
- 8 Explain about various power quality measurement equipment.

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Time: 3 hours

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Answer any FIVE questions
All questions carry equal marks

- 1 (a) Explain about short-duration voltage variations.
(b) Write a short note on (i) Impulsive transients (ii) Voltage imbalance.
- 2 Explain about various solutions at the end user level protection.
- 3 Explain various strategies for utilities to decrease the impact of lightning.
- 4 (a) Define harmonic distortion and write a short note on it.
(b) What are the various harmonic sources from commercial loads? Explain.
- 5 What are the effects of harmonics? And explain the harmonic distortion evaluation procedure.
- 6 (a) Explain the principles of regulating the voltage.
(b) Explain the working of various devices for voltage regulation.
- 7 (a) Describe the process of power quality bench marking.
(b) Explain the following power quality contracts
(i) Harmonic agreements.
(ii) Example contract.
- 8 Explain the various power quality monitoring considerations.
