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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 71640

M.E. DEGREE EXAMINATION, JUNE/JULY 2013.

Elective

Power System Engineering

PE 9261/PE 961/10233 PSE 23 — POWER QUALITY

(Common to M.E. Power Electronics and Drives, M.E. Electrical Drives and Embedded Control, M.E. Power Management and M.E. High Voltage Engineering)

(Regulation 2009/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the various power quality issues?

2. List any four standards available in power quality.

3. How do fluorescent lighting affects the power quality?

4. Distinguish between non linear and unbalanced load.

5. What is event recorder? Give an example.

6. What is the need for FFT Spectrum analyzer in power quality analyzers?

7. Define Voltage Sag Lost Energy Index (VSLEI).

8. Give the methods for voltage sag reduction.

9. Write the applications of custom power devices.

10. How can Power Quality problems be detected?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain power quality problems associated with notching in load voltage. (8)

(ii) Define and explain waveform distortion and voltage fluctuations. (8)

Or

(b) (i) Write the various IEEE and IEC power quality standards. (8)

(ii) Draw the CBEMA curve for transient over voltages and explain. (8)

12. (a) (i) Describe briefly arc furnace affects the power quality. (8)

(ii) What is adjustable speed drives? Explain its operations connected with power quality issues. (8)

Or

(b) (i) Describe the procedure for estimating harmonics produced by battery chargers. (8)

(ii) Describe in detail how the single phase rotating AC/DC create the power quality problem. (8)

13. (a) (i) What are the types of frequency domain analyzing methods? Discuss in detail any one method. (8)

(ii) What is Laplace transform and briefly explain its properties. (8)

Or

(b) (i) Explain power and energy measurement methods in detail. (8)

(ii) Explain Walsh transform with mathematical expression. (8)

14. (a) Explain instantaneous real and reactive powers with help of mathematical expression. (16)

Or

(b) Name and describe in detail classical load balancing problems. (16)

15. (a) (i) Explain the voltage regulation using DSTATCOM. (8)

(ii) Draw and explain harmonics reduction using Hybrid filters. (8)

Or

(b) Write short notes on :

(i) P-Q theory (8)

(ii) Power quality improvement using UPQC. (8)
