

L1B
30/11/13 FN

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Question Paper Code : 82117

M.E. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Elective

Power Electronics and Drives

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

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

(Regulation 2009/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Give the importance of power quality standards.
2. Name the causes of waveform distortion.
3. Distinguish between static and rotating AC/DC converters.
4. How does non-linear load affect power quality?
5. State measurement error.
6. Compare time domain and frequency domain analysis.
7. Name and state harmonics indices.
8. Define Voltage Sag Lost Energy Index (VSLEI).
9. Distinguish between passive and active filters.
10. List any two control strategies employed in power quality improvement.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain how voltage fluctuations and voltage imbalance causes power quality problems. (8)
(ii) Describe power quality problems due to non linear and unbalanced loads. (8)
- Or
- (b) (i) Explain Computer Business Equipment Manufactures Association (CBEMA) curve and list its applications. (8)
(ii) Discuss in detail disturbances in supply voltage. (8)

12. (a) (i) Discuss the operation of battery chargers related to power quality issues. (8)
(ii) Describe the effects of pulse modulated devices on electric power quality. (8)

Or

- (b) (i) In brief describe the operation of fluorescent lighting and how which will affect the power quality. (8)
(ii) What is adjustable speed drive and describe its operation. (8)
13. (a) (i) Define and explain wavelet transform. (8)
(ii) Explain power and energy measurements. (8)

Or

- (b) (i) Explain the operation event recorders. (8)
(ii) Discuss in detail the application of Walsh transform to power quality. (8)
14. (a) (i) Describe closed loop load balancing problem with necessary diagram. (8)
(ii) Explain effect of harmonics on power system devices. (8)

Or

- (b) (i) What is harmonics? Explain with the help of necessary equation harmonic order Vs frequency. (8)
(ii) Explain different methods involved in reduction of voltage sag. (8)
15. (a) (i) Describe in detail the load compensation using DSTATCOM. (8)
(ii) Explain in detail synchronous detection method. (8)

Or

- (b) Name and explain different methods involved in protecting sensitive loads. (16)