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Question Paper Code : 87057

M.E. DEGREE EXAMINATION, MAY/JUNE 2016

Elective

Electrical Drives and Embedded Control

PX 7204 – POWER QUALITY

(Common to M.E. Power Electronics & Drives / M.E. Power Systems Engineering)

(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. Mention any six major PQ issues.
2. What are power acceptability curves. Mention its applications.
3. What are non linear loads. List any two used in practice.
4. Define power factor in terms of displacement and distortion factor.
5. What is current balancing ?
6. Fundamental sequence component helps in PQ analysis. Justify.
7. How reference current helps in compensation ?
8. Give the role of DSTATCOM in PQ improvement.
9. Distinguish compensator & active filter.
10. Draw the structure of UPQC.

PART – B (5 × 13 = 65 Marks)

11. (a) (i) Enumerate the different Power Quality issues with suitable illustration. (10)
(ii) What are the causes of poor power factor. Illustrate. (3)

OR

- (b) (i) What is the importance of power quality standards ? Explain. (8)
(ii) Differentiate and illustrate Waveform distortion and Voltage fluctuation, Voltage sag and voltage swell. (5)

12. (a) Analyze the power flow and power factor in case of a single phase sinusoidal source supplying a non linear load. (13)

OR

- (b) (i) Analyze a three phase unbalance system. (7)
(ii) Distinguish three phase three wire and four wire systems. (6)

13. (a) What is load balancing problem ? Explain Open and closed loop balancing. (13)

OR

- (b) Explain the load compensation using instantaneous real and reactive power method. (13)

14. (a) (i) How reference currents are generated during source unbalance ? (5)
(ii) Explain the working of DSTATCOM in voltage control mode. (8)

OR

- (b) Elucidate the concept of reference current generation using instantaneous PQ theory and instantaneous symmetrical component theory. (13)

15. (a) Explain the operation of
(i) DVR (6)
(ii) Series Active Filter (7)



OR

- (b) Explain the structure and working of UPQC in detail. (13)

PART – C (1 × 5 = 15 Marks)

16. (a) (i) Explain the concept of power factor with its consequences. Illustrate how the power factor can be improved with a capacitor. Use phasor diagram analysis. (12)
(ii) Differentiate ripple and harmonics. (3)

OR

- (b) (i) Explain the structure and working of a shunt active filter and highlight its role in the operation of UPQC. (10)
(ii) How active filters are superior than passive filters. Justify with their merits and demerits. (5)