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Question Paper Code: 92051

M.E. DEGREE EXAMINATION, OCTOBER - 2014.

Elective

Power Electronics and Drives

01PPE508-ELECTRIC POWER QUALITY

(Regulation 2013)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. What is transient? Give the types of transients.

2. Define Notching and what are the causes of it?

3. What is non – linear load?

4. Specify the drawbacks of low pf in AC system.

5. Give the principles of regulating the voltage.

6. How will extract the fundamental sequence component from measured waveforms / Frequency spectrum?

7. Draw a typical P (active power) and Q (reactive power) waveform for a linear load.

8. List out the advantages of STATCOM.

9. Define series active filter.

10. What is voltage restoration? and why it is required for power system?

PART - B (5 x 14 = 70 Marks)

11. (a) Investigate the long duration and short duration voltage variations in power systems. (14)

Or

(b) With relevant sketches illustrate the following

    (i) CBEMA curves and ITI curves (7)
    (ii) Area of vulnerability. (7)

12. (a) (i) Explain in detail about the single phase sinusoidal source supplying linear load with relevant diagrams and waveforms. (7)

    (ii) Explain in detail about the single phase sinusoidal source supplying non - linear load with relevant diagrams and waveforms. (7)

Or

(b) (i) Explain in detail with neat diagrams and waveforms of three phase unbalanced and distorted source supplying non - linear loads. (7)

    (ii) Compare and contrast three phase three wire and three phase four wire systems. (7)

13. (a) (i) Discuss in detail about the voltage regulating devices used for maintain the voltage across the load in the power system. (7)

    (ii) Explain briefly about instantaneous real and reactive power with neat sketches. (7)

Or

(b) Explain load balancing technique and discuss in detail about the open loop and closed loop load balancing with diagrams. (14)

14. (a) (i) Discuss in detail about the generation of reference currents using PQ theory. (7)

    (ii) Discuss in detail about the generation of reference currents when the source is unbalanced. (7)

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(b) (i) What is DSTATCOM? Discuss in detail about the DSTATCOM in voltage control mode. (7)

(ii) Explain the load compensation using three phase shunt compensator structure with necessary diagrams. (7)

15. (a) (i) Explain in detail about the rectifier supported DVR. (7)

(ii) Explain in detail about the DC capacitor supported DVR. (7)

Or

(b) (i) Explain the use of series active filter for power distribution systems. (7)

(ii) Explain in detail about the operating principle and working of UPQC for power distribution systems. (7)

PART - C (1 x 10 = 10 Marks)

16. (a) Discuss in detail about the instantaneous symmetrical components theory and how it is used for load compensation in power systems with necessary waveforms and diagrams. (10)

Or

(b) (i) How the compensation of single phase loads are done using compensation devices? (5)

(ii) Explain briefly about the realization and control of STATCOM. (5)

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