Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 86589

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Eighth Semester

Electrical and Electronics Engineering

EE 1004 — POWER SYSTEM TRANSIENTS

(Regulations 2008)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is resistance switching?

2. State the importance of transient study in planning.

3. Define the concept of chopping.

4. Differentiate normal and abnormal switching transients.

5. How do earthing screen and ground wires provide protection against direct lightning strokes?

6. What is tower footing resistance?

7. Define attenuation and distortion.

8. What are the effects of load rejection in power systems?

9. Draw the lattice diagram for a single transmission line terminated in an impedance Z.

10. What is meant by EMTP? Write about its importance in transient analysis.

PART B — (5 × 16 = 80 marks)

11. (a)   What are the various types of power system transients? With neat diagrams, describe any two types of power system transients in detail.

(16)

Or

(b) (i) Discuss about the effect of transients on power systems. (8)

(ii) Describe briefly about double frequency transients. (8)

12. (a) (i) Write short notes on current suppression with neat waveform. (8)

(ii) Explain load switching with their equivalent circuit. (8)

Or

(b) (i) Explain with appropriate waveform the capacitance switching with one and multiple restrikes. (8)

(ii) Write short notes on ferro resonance. (8)

13. (a) (i) Discuss the physical phenomenon of lighting in detail with appropriate diagrams. (8)

(ii) Explain the mechanism of lighting strokes. (8)

Or

(b) (i) Derive the mathematical model for lighting. Write and express various parameters in lighting model. (8)

(ii) Write a detailed technical note on the interaction between lighting and power system mentioning the cause and effects. (8)

14. (a) (i) Discuss about Bewely's Lattice Diagram. (6)

(ii) Explain the phenomena of current interruption in a lumped capacitive circuit and a distributed constant transmission line. (10)

Or

(b) A transmission line of surge impedance 500 Ω is connected through a cable of surge impedance 40 Ω to another line of surge impedance 650 Ω. A travelling wave of 120 u(t) kV travels from 500 Ω line to 5000 Ω line through cable. Calculate.

15. (a) Explain the switching operation involved in transmission line

(i) Line dropping and load rejection of line (8)

(ii) Closing and re closing of lines. (8)

Or

(b) Explain in detail the steps involved in computing transients in power system using EMTP. (16)

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