Reg. No. :

Question Paper Code : 20494

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2022.

Seventh Semester

Electrical and Electronics Engineering

EE 8010 — POWER SYSTEMS TRANSIENTS

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the effects of transients on power system.

2. Draw the double frequency transient with an example.

3. Give the objectives of switching capacitor banks.

4. Define Current Chopping.

5. Write the significance of tower footing resistance.

6. What is called charge formation?

7. What are the specifications of a travelling wave?

8. Define surge impedance of a line and comment on reason for naming it as natural impedance.

9. How will you calculate the probability of strikes for an overhead line?

10. What are the effects of load rejection in power system?

PART B — (5 × 13 = 65 marks)

11. (a) What are the broad classification of power system transients? Describe its different types depending upon its nature. (5+8)

Or

(b) Explain the transients associated with switching an LC circuit with sine wave excitation.

12. (a) (i) With neat diagram explain the concept of load switching.   (7)

     (ii) Explain the concept of ferro resonance.   (6)

                                    Or

     (b) What is meant by current suppression? Explain the transients due to switching of an unloaded transformer with relevant wave forms.

13. (a) What are the two theories of charge formation in the clouds? Explain them in detail.

                                    Or

     (b) Explain the mechanisms by which lightning strokes develop and induce over voltages on overhead power line.

14. (a) Draw the step response of a travelling wave. Explain it by using Bewely's lattice diagram.

                                    Or

     (b) Analyze the phenomenon of current interruption in a lumped capacitive circuit and a distributed constant transmission lines.

15. (a) Analyze the commutation of Transients in power system using FMTP.

                                    Or

     (b) Discuss in detail about the switching surges on an integrated power system.

                    PART C — (1 × 15 = 15 marks)

16. (a) (i) Describe the causes of over voltages induced by various faults in a power system in detail.   (10)

     (ii) Explain briefly about resistance switching with suitable diagram.   (5)

                                    Or

     (b) (i) Derive the expressions for response and recovery voltage of a shorted line.   (10)

     (ii) Explain the causes of transients on closing and reclosing of transmission lines.   (5)

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