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Question Paper Code : 11284

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2026.

Fifth/Sixth/Seventh/Eighth Semester

Electrical and Electronics Engineering

EE3037 – POWER SYSTEM TRANSIENTS

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define electrical transients.
2. What are the sources of transients?
3. What is current chopping?
4. Draw the equivalent circuit of resistance switching.
5. Differentiate lightning and over voltage.
6. What is the significance of tower footing resistance?
7. Write the damages caused by the travelling waves.
8. Define lumped parameters.
9. What is kilometric fault?
10. What are the effects of load rejection in power systems?

PART B — (5 × 13 = 65 marks)

11. (a) Describe the importance of transient studies in power system operation and control.

Or

- (b) Explain the effect of voltage transients on power systems.

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12. (a) Discuss load switching with equivalent circuit in both normal and abnormal conditions.

Or

- (b) Illustrate the concept of capacitance switching and discuss the effect of re-strike and multiple re-strike.

13. (a) Discuss the two different theories of charge generation and separation in the thunder cloud.

Or

- (b) Explain how ground wires and tower footing resistance are used against lightning transients.

14. (a) Describe the phenomena of reflection and retraction in traveling waves.

Or

- (b) Explain how dissipation influences the propagation of waves in overhead transmission lines.

15. (a) Explain the cause of transients on closing and reclosing of transmission lines.

Or

- (b) Discuss the effects of switching surges on integrated power system operation.

PART C — (1 × 15 = 15 marks)

16. (a) Describe the interaction of lightning with power systems and explain the mathematical representation of lightning phenomena.

Or

- (b) Illustrate the equivalent circuit of a two-conductor transmission line, derive its wave equation and describe how modal analysis is used to solve it.