Question Paper Code : 80481

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

Sixth Semester

Electrical and Electronics Engineering

EE 2027/EE 604/10133 EEE 16 — POWER SYSTEM TRANSIENTS

(Regulations 2008/2010)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define transient.

2. Find the inverse Laplace transform of $\dfrac{1}{s(s+\alpha)}$.

3. What is current suppression?

4. Define ferro resonance.

5. What do you mean by lightning?

6. What are the characteristics of lightning strokes?

7. Brief method of standing waves in analyzing the transients.

8. What is a traveling wave? What is the role of distributed parameters (R, L, C) in it?

9. Mention any four causes of switching surge.

10. Define switching over voltage factor.

PART B — (5 × 16 = 80 marks)

11. (a) Enumerate the types of transients and detail their origin and effects.

Or

(b) The Laplace transform of certain voltage is given by

$$\frac{1.9\times10^{11}}{s^2 + 2.1\times10^5 s + 2\times10^{11}}.$$

Evaluate the time function and sketch its form with reasonable accuracy.

12. (a) With a neat diagram explain the occurrence of transients

    (i) Resistance switching (8)

    (ii) Capacitance switching. (8)

Or

    (b) Explain clearly the phenomenon of current chopping (or current suppression). For the purpose of illustration draw necessary diagrams and waveforms.

13. (a) (i) With neat diagrams, explain the mechanism of cloud formation. (6)

    (ii) What is called grounding? Explain the importance and working of Grounding a line structure. (10)

Or

    (b) (i) What is meant by lightning discharge? Explain its mechanism in detail. (10)

    (ii) What are the characteristics of Lightning strokes? (6)

14. (a) Explain the steps involved in Bewley's Lattice diagram construction with an example. (16)

Or

    (b) (i) Discuss transient response of systems with series and shunt lumped parameters and distributed lines. (8)

    (ii) Derive the refraction coefficients of a traveling wave. (8)

15. (a) Describe the line dropping and load rejection in detail.

Or

    (b) Explain in detail the application of EMTP for transient computation.

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