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Question Paper Code : 91028

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

Fifth/Sixth/Seventh/Eighth Semester

Electrical and Electronics Engineering

EE 3037 – POWER SYSTEM TRANSIENTS

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Write short note on RLC circuit transient.
2. Write the basic transform of RLC circuit transient
3. Define current suppression.
4. List out causes of switching surge.
5. Write the significance of tower footing resistance.
6. Mention the factors contributing good line design.
7. Define reflective and refractive coefficient of travelling waves.
8. List the application of travelling waves.
9. What are the applications of EMTP?
10. State the significance of nonlinear resistance using EMTP.

PART B — ($5 \times 13 = 65$ marks)

11. (a) Explain the modelling of transformer for high frequency transient with neat diagram.

Or

- (b) Explain in detail about the classification of power system transients.

12. (a) With neat circuit diagram and characteristics, explain about the current suppression and current chopping.

Or

- (b) With neat circuit diagram and characteristics, explain the multiple restriking transients and derive its restriking voltage ($V_{\max.}$)
13. (a) Illustrate the characteristics of lightning strokes and also discuss the parameters of lightning flash.

Or

- (b) Explain the lightning protection scheme for transmission lines with appropriate diagrams.
14. (a) Explain the behavior of traveling waves at line terminations for
- (i) Open circuit and (7)
- (ii) Short circuit lines. (6)

Or

- (b) Explain the step-by-step procedure involved in Bewley's Lattice diagram construction with appropriate example.
15. (a) Illustrate the computation mechanism and algorithms for analyzing the transients in Integrated power systems.

Or

- (b) Explain in detail about line dropping and load rejection.

PART C — ($1 \times 15 = 15$ marks)

16. (a) A long transmission line is energized by a unit step voltage 1.0 V at the sending end and is open circuited at the receiving end. Develop the Bewley's Lattice diagram and obtain the value of the voltage at the receiving end after a long time. Take the attenuation factor as 0.8.

Or

- (b) An overhead line is 600 Km long and has a surge impedance of 500 Ω . The line is short-circuited at the receiving end and the voltage of 6000V is applied to the other end. Draw the diagrams of current and voltage waves. Also calculate the sending end current after 0.008 sec. Neglect the resistance of the line.