Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 20433

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Sixth Semester

Electrical and Electronics Engineering

EE 6002 – POWER SYSTEM TRANSIENTS

(Regulations 2013)

(Common to : PTEE 6002 – Power System Transients for B.E. (Part-Time) – Fifth Semester – Electrical and Electronics Engineering – Regulations – 2014)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Power System Transient.
2. Name any two effects of transients in power system.
3. Draw the equivalent circuit of resistance switching.
4. Define Ferro-resonance.
5. What is the significance of tower footing resistance?
6. State the parameters and characteristics of the lightning stroke.
7. What are the specifications of a travelling wave?
8. Write down the expressions for reflection coefficient and refraction coefficient.
9. Draw the Norton's equivalent circuit to model a capacitor in a network for EMTP calculation.
10. Define Kilometric fault.

PART B — (5 × 13 = 65 marks)

11. (a) Explain in detail, the sources of transients and the different types of power system transients. (13)

Or

(b) Explain in detail, the need for study of transients in system planning. (13)

12. (a) What is capacitance switching? Explain the effect of source regulation and capacitance switching with one and multiple restrikes. (13)

Or

(b) Explain in detail with suitable example, and necessary waveforms the normal and abnormal switching transients and ferro-resonance. (13)

13. (a) Explain in detail with necessary diagram, the mechanism of lightning discharges and also the characteristics of the lightning strokes. (13)

Or

(b) Discuss in detail, the factors that contribute to good line design. How the ground wires are protected from lighting transients? (13)

14. (a) Discuss in detail with mathematical formulation, the characteristics of reflection of travelling waves and refraction of travelling waves. (13)

Or

(b) Discuss in detail about the standing waves and Standing Wave Ratio (SWR). (13)

15. (a) Explain in detail about the switching surges on an integrated power system. (13)

Or

(b) Discuss in detail, about the causes of over voltages induced by various faults occurring in power system. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Derive the mathematical expressions for the response and recovery voltage of a shorted line in integrated power system. Discuss the need for the study of transients in power system.

Or

(b) Enumerate with a mathematical equation and necessary waveforms the voltage transients generated during opening and reclosing lines.

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