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

Question Paper Code : 60511

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Electrical and Electronics Engineering

EE 2353/EE 63/10133 EE 603 — HIGH VOLTAGE ENGINEERING

(Regulations 2008/2010)

(Common to PTEE 2353 / 10133 EE 603 – High Voltage Engineering for B.E. (Part-Time) Fifth Semester – Electrical and Electronics Engineering – Regulations 2009/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the factors that influence the lightning induced voltage on transmission line?

2. Why a simple spark gap cannot offer full protection against over voltages?

3. What is Town-sends condition for Breakdown?

4. Define statistical time lag and formative time lag.

5. Write about the Deltatron circuit.

6. Give some merits of vande Graff generator.

7. Define CVT.

8. Give the advantages of electrostatic voltmeter.

9. Define disruptive discharge voltage.

10. Mention the characteristics of the spray used in wet flashover test.

PART B — (5 × 16 = 80 marks)

11. (a) (i) What are the sources of switching surges? Explain the characteristics of switching surges with typical wave shapes. (10)

(ii) Discuss the various controlling methods of over voltages due to switching and power frequency. (6)

Or

(b) (i) A long transmission line is energized by a unit step voltage of 1.0 V at the sending end and is open circuited at the receiving end. Construct the Bewley Lattice diagram and obtain the value of the voltage at the receiving end after a long time- Take the attenuation factor $\alpha = 0.8$. (10)

(ii) Write a short note on ground rods as protective devices. (6)

12. (a) A certain dielectric can be considered to be represented by the equivalent circuit shown in figure 12 (a). What is the maximum voltage that can be applied across the dielectric, if partial discharges in air to be avoided? State any assumptions made.

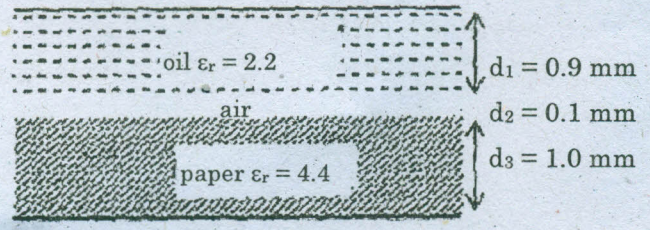

Figure. 12 (a)

Or

(b) From the fundamental principles, derive Townsend's criteria for the breakdown of gaseous dielectric medium.

13. (a) (i) Explain the operation of basic impulse generator. (8)

(ii) Explain the cascaded transformer method of HVAC generation. (8)

Or

(b) Explain the operation of vande graff generator from the electrostatic principle. (16)

14. (a) Explain any two methods to measure high impulse current.

Or

(b) (i) Enumerate digital peak voltmeter. (8)

(ii) What is CVT? Explain how CVT can be used for high voltage ac measurement. (8)

15. (a) Describe the various tests to he carried out on a circuit breaker.

Or

(b) (i) Discuss the different aspects of insulation design and insulation co-ordination adopted for EHV systems. (8)

(ii) Explain the function of discharge device used in power capacitor and explain the test for efficacy of this device. (8)
