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**Question Paper Code : P 1296**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2009.

Seventh Semester

Electrical and Electronics Engineering

EE 1402 — HIGH VOLTAGE ENGINEERING

(Common to B.E. (Part-Time) Sixth Semester-Regulation 2005)

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the different types of over voltages occurring in power system and mention their magnitude.
2. Define indirect stroke.
3. What are Meta stable atoms? How they are ionizing the gaseous dielectric medium?
4. Define formative time lag.
5. Draw a circuit diagram of a simple resonant transformer method.
6. Give some uses of TVLC.
7. What are the factors influencing the measurements using sphere gap?
8. What are the general methods used for measurement of high frequency and impulse currents?
9. Define creepage distance.
10. Give the Indian Standard reference atmospheric conditions for high voltage testing.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Give the mathematical model of lightning discharges and explain them. (10)
- (ii) Discuss causes of power frequency over voltage in transmission line. (6)

Or

- (b) Explain the characteristics of switching surges with typical wave shapes clearly. (16)

12. (a) Explain clearly breakdown in non-uniform fields and corona discharges. (8+8)

Or

- (b) Classify the various break down mechanisms occurring on solid dielectrics and explain them briefly. (16)

13. (a) With a neat sketch explain the working principle of Van de Graff generator. (16)

Or

- (b) Give the Marx circuit-multistage impulse generator. How the basic arrangements are modified to accommodate the wave time control resistances? (16)

14. (a) With a neat sketch explain the principle of operation of an electrostatic voltmeter for HVAC measurements. What are the merits and demerits? (12+4)

Or

- (b) Tabulate the high voltage and high current measurement techniques for different types of voltages and currents. (16)

15. (a) With a neat sketch explain the impulse testing on the power transformer. (16)

Or

- (b) Explain the following terms used in HV testing as per the standards:
- (i) Disruptive discharge voltage
  - (ii) Impulse voltage
  - (iii) 50% and 100% flash over voltage
  - (iv) Withstand voltage. (4 + 4 + 4 + 4)