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Question Paper Code : 80385

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

Seventh Semester

Electrical and Electronics Engineering

EE 6701 — HIGH VOLTAGE ENGINEERING

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is back flashover?
2. Define Isokeraunic level or thunderstorm days.
3. What is ionization by collision?
4. Define Gas law.
5. What is a tesla coil?
6. What is Deltatron circuit?
7. What are the advantages of generating voltmeters?
8. List some advantages of Faraday generator.
9. Define 50% flash over voltage.
10. What are the tests need to be conducted on power transformer?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the mechanism of lightning stroke. (10)
(ii) Give the mathematical model for lightning discharges and explain them. (6)

Or

- (b) Explain the different methods employed for lightning protection of overhead lines. (16)

12. (a) From the fundamental principles, derive Townsend's criteria for the breakdown of gaseous dielectric medium. (16)

Or

- (b) Explain the various breakdown theories involved in commercial liquid dielectrics. (16)

13. (a) (i) Mention the necessity of generating high DC voltages. (4)
(ii) Explain with a neat diagram the generation of high DC voltages using Van-de-graff generator. State the factors which limit the voltage developed. (12)

Or

- (b) Explain the working principle of Cockroft-Walton voltage multiplier circuit. Derive an expression for total voltage drop and total ripple voltage of n-stage voltage multiplier circuit and hence deduce the condition for optimum number of stages. (16)

14. (a) (i) Enumerate digital peak voltmeter. (8)
(ii) What is CVT? Explain how CVT can be used for high voltage AC measurement. (8)

Or

- (b) Explain how a sphere gap can be used to measure the peak value of voltages? Also discuss the parameters and factors that influence such voltage measurement? (16)

15. (a) Discuss the various tests carried out in a circuit breaker at HV labs. (16)

Or

- (b) Explain in sequence the various high voltage test being carried out in a power transformer. (16)