

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007

Seventh Semester

Electrical and Electronics Engineering

EE 433 --- HIGH VOLTAGE ENGINEERING

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by Insulation Co-ordination?
2. List the various causes of over voltages in a power system.
3. What is time lag in the break down of dielectric mediums?
4. What are electronegative gases? Give example.
5. Draw a circuit diagram of a simple voltage doubler.
6. Write the expressions to find the optimum no. of stages and % ripple in a voltage multiplier circuits.
7. List the factors that are influencing the peak voltage measurement using sphere gap.
8. Draw the simple circuit of peak reading voltmeter and it's equivalent circuit.
9. Differentiate type test and routine test.
10. Give the values of reference atmospheric conditions as per I.S. specifications.

PART B — (5 × 16 = 80 marks)

11. (i) What are the causes for switching and power frequency over voltage?
How are they controlled in power systems? (12)
- (ii) Explain lightning phenomena. (4)

12. (a) Deduce an expression for Townsend's criterion for breakdown in a uniform medium.

Or

- (b) Explain the Townsend's secondary ionization processes which lead to current growth in gaseous mediums.

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

Or

- (b) Explain any one method of generating HV AC at power frequency and discuss its limitation/feature.

14. (a) With a neat sketch explain the principle of operation of an electrostatic voltmeter for HV AC measurement. What are the merits and demerits?

Or

- (b) What is CVT? Explain through phasor diagram how a tuned CVT can be used for HV AC measurement in substations.

15. (a) What is the significance of impulse tests? Briefly explain the impulse testing of insulators.

Or

- (b) Explain the following terms used in HV testing as per the standards :

- (i) Disruptive discharge voltage
 - (ii) Creepage distance
 - (iii) Impulse voltage
 - (iv) 100% flash over voltage.
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