

B.E. Eighth Semester (Electrical Engineering) (CGS)
10469 : High Voltage Engineering : 8 EE 02 / 8 EP 02 / 8 EL 02

P. Pages : 2

Time : Three Hours



AU - 3024

Max. Marks : 80

- Notes :
1. Answer **three** question from Section A and **three** question from Section B.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answer necessary with the help of neat sketches.

SECTION - A

1. a) State and derive the Townsend's second ionization coefficient. 8
b) Explain breakdown theory in electronegative gases. 6

OR

2. a) Explain streamer theory of breakdown of gases. 8
b) A steady current of 600 μA flows through the parallel plate electrode separated by a distance of 0.6 cm when a voltage of 12 kV applied. Determine the Townsend's first ionization coefficient if the current of 60 μA flows when the distance of separation is reduced to 0.1 cm and field is kept constant at various values. 6
3. a) Explain the construction and working of high voltage bushing. 6
b) Explain suspended particle theory. 7

OR

4. a) Give the classification of liquid dielectric and explain electroconvection breakdown theory. 7
b) Explain breakdown due to treeing and tracking. 6
5. a) Enlist various methods for reduction of overvoltage due to switching surges and explain any two in details. 6
b) Explain meaning of surge ? Draw and explain the waveform of transient voltage and hence explain the various causes for overvoltages in power system. 7

OR

6. a) Enlist various types of lightning arrester and explain any two in details. 7
b) Explain streamer mechanism of lightning discharge. 6

SECTION - B

7. a) A Cockroft Walton voltage multiplier circuit has 10 stages with capacitances are equal to $0.06 \mu\text{F}$. The supply transformer secondary voltage is 100 kV at frequency 150 Hz. If the current is to supplied is 1 mA. Find : 7
- i) % Ripple
ii) % Regulation
iii) The optimum number of stages for minimum voltage regulation on voltage drop.
- b) Explain multistage impulse voltage generator (Marx circuit) 7

OR

8. a) Explain voltage Doubler (Greinacher) circuit. 7
- b) Explain in details Van De Graff generator. 7
9. a) Explain resistive potential divider methods of measurement of high voltage. 6
- b) Explain construction and working of electrostatic voltmeter. 7

OR

10. a) Explain the measurement of capacitance and loss tangent. 7
- b) Explain the measurement of surges. 6
11. a) Explain the testing of circuit breaker in details. 8
- b) Explain type test and routine test and define : 5
- i) 50% flashover voltage
ii) Creepage distance.

OR

12. a) Explain the partial discharge test in high voltage cable testing. 5
- b) Enlist various test carried out on insulators and explain porosity and temperature cycle test in details. 8

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