

Roll No.

3244

**B. Tech. 5th Semester (EE) (Elective - I)
Examination – March, 2021**

HIGH VOLTAGE ENGINEERING

Paper : PEC-EE-07G

Time : Three Hours]

[Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all, selecting at least one question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

1. (a) State Paschen's law for breakdown in gases.

2.5 × 6 = 15

(b) Explain difference between 'photo-ionization and photo-electric emission.

(c) Define front time and tail times of impulse wave.

(d) Why are capacitance voltage divider preferred for high ac voltage measurement ?

(e) Define Disruptive discharge voltage and Withstand voltage.

- (f) Define 'complex permittivity'. How is lossy dielectric represented?

UNIT - I

2. (a) Define Townsend's first and second ionization coefficients. How is the condition for breakdown obtained in Townsend discharge? 7.5
(b) Explain the experimental set-up for the measurement of pre-breakdown current in gas. 7.5
3. (a) What are common liquid insulants used in electrical apparatus? Briefly explain their physical properties. 7.5
(b) Explain the various theories that explain breakdown in solid dielectric. 7.5

UNIT - II

4. (a) Draw and explain different circuits that produce impulse wave. 7.5
(b) Explain the different schemes for cascade connections of transformers for producing very high ac voltages. 7.5
5. Explain the principle and construction of an electrostatic voltmeter for very high voltages. What are its merits and demerits for high-voltage ac measurement? 15

3244- (P-3)(Q-9)(21) (2)

UNIT - III

6. (a) Explain the different theories of charge formation in clouds. 7.5
(b) Explain the importance of switching overvoltage in EHV power system. How is protection against overvoltage achieved? 7.5
7. (a) Explain the phenomenon of measurement of Dielectric constant and loss factor. 7.5
(b) Explain how partial discharge in an insulation system or equipment can be detected and displayed. 7.5

UNIT - IV

8. Explain the different test done on isolator and circuit breaker in EHV system. 15
9. (a) Explain the terms : 7.5
(i) with stand voltage
(ii) flashover voltage
(iii) 50% flash over voltage
(iv) wet and dry frequency test referred to high voltage testing
- (b) Explain importance of RIV measurement for EHV power apparatus. 7.5

3244- (P-3)(Q-9)(21) (3)