



B.E DEGREE EXAMINATIONS: NOV/DEC 2024

(Regulation 2018)

Sixth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U18EEE0003: High Voltage Engineering

COURSE OUTCOMES

- CO1:** Understand the causes and effects of over voltages and protection of power system against over voltages.
- CO2:** Understand the different breakdown mechanisms in Gases, liquids and solids.
- CO3:** Understanding the principle of generation of high DC, AC and impulse voltages.
- CO4:** Understanding of the various measurement techniques of high voltages and high currents.
- CO5:** Understanding the testing of high voltage electrical power apparatus.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

(Answer not more than 40 words)

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|--|-----|-------------------|
| 1. Differentiate switching surge from lightning impulse. | CO1 | [K ₂] |
| 2. Define surge impedance of a Transmission Line. | CO1 | [K ₁] |
| 3. What is meant by Townsend's discharge? Explain its main features. | CO2 | [K ₂] |
| 4. State Paschen's law. Write the expression. | CO2 | [K ₂] |
| 5. What are the advantages of high frequency transformers? | CO3 | [K ₁] |
| 6. What is an impulse voltage? Draw its waveform. | CO3 | [K ₂] |
| 7. What are the elements which cause different errors in measurements? | CO4 | [K ₁] |
| 8. List the various types of errors in measurement. | CO4 | [K ₂] |
| 9. List out any four tests on cables. | CO5 | [K ₁] |
| 10. What is impulse withstand voltage test. | CO5 | [K ₁] |

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

(Answer not more than 400 words)

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|--|----|-----|-------------------|
| 11. Illustrate the different theories of charge formation in clouds | 16 | CO1 | [K ₂] |
| 12. a) Explain the various mechanisms of breakdown in composite dielectrics. | 8 | CO2 | [K ₂] |

	b)	Explain the primary and secondary breakdown mechanism of gaseous dielectrics.	8	CO2	[K ₂]
13.	a)	Explain the generation of high AC voltages using cascaded transformers with neat diagram.	8	CO2	[K ₂]
	b)	Explain the use of Van-de-graff generator.	8	CO2	[K ₂]
14.		Discuss the various techniques for the measurement of impulse voltages.	16	CO3	[K ₂]
15.	a)	Explain in detail about the impulse testing of transformers.	12	CO4	[K ₂]
	b)	Discuss in detail the power frequency voltage withstand test on a 66 kV porcelain insulator.	4	CO4	[K ₂]
16.		Explain the measurement of very high voltages using sphere gaps.	16	CO4	[K ₂]
