



B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

Seventh 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. List the various causes of over voltages in electric power system. | CO1 | [K ₁] |
| 2. Write the importance of Isokeraunic level. | CO1 | [K ₂] |
| 3. What is meant by an intrinsic strength of a solid dielectric? | CO2 | [K ₁] |
| 4. What do you understand treeing and tracking? | CO2 | [K ₂] |
| 5. Write the role of generating voltmeter. | CO3 | [K ₂] |
| 6. Draw any one circuit for producing impulse wave. | CO3 | [K ₂] |
| 7. Briefly explain the working of trigatron gap. | CO4 | [K ₂] |
| 8. Draw the circuit arrangement for measurement of ripple voltage. | CO4 | [K ₂] |
| 9. Define creepage distance. | CO5 | [K ₂] |
| 10. Mention any four tests on bushings. | CO5 | [K ₂] |

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

(Answer not more than 400 words)

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|---|----|-----|-------------------|
| 11. Explain the mechanism of lightning strokes. Also explain the parameters and characteristics of lightning strokes. | 16 | CO1 | [K ₂] |
| 12. Explain the different theories to explain breakdown in commercial liquid dielectrics. | 16 | CO2 | [K ₂] |

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|-----|----|--|----|-----|-------------------|
| 13. | a) | With a neat sketch explain the working of Van de Graff generator. | 12 | CO3 | [K ₂] |
| | b) | List the essential parts of an impulse current generator. | 4 | CO3 | [K ₂] |
| 14. | a) | Explain the principle and construction of an electrostatic voltmeter for very high voltages. | 10 | CO4 | [K ₂] |
| | b) | Why are capacitance voltage dividers preferred for high AC voltage measurements? | 6 | CO4 | [K ₂] |
| 15. | | Explain how a sphere gap can be used to measure the peak value of voltages. What are the parameters and factors that influence such voltage measurement? | 16 | CO4 | [K ₂] |
| 16. | a) | What are the different tests conducted on cables? Explain any one method in detail. | 8 | CO5 | [K ₂] |
| | b) | Explain the method of impulse testing of high voltage transformers. | 8 | CO5 | [K ₂] |
