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Reg. No.

Question Paper Code

11802

**B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL/MAY 2023**

Seventh Semester

**Electrical and Electronics Engineering**

**EE8701 - HIGH VOLTAGE ENGINEERING**

(Regulations 2017)

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

- |   | <i>Marks,<br/>K-Level,CO</i> |
|---|------------------------------|
| 1. Define Isokeraunic level or thunderstorm days.   | 2,K1,CO1                     |
| 2. What is counter poise wire? Give its use.  | 2,K2,CO1                     |
| 3. Identify the Town-sends condition for breakdown.   | 2,K2,CO2                     |
| 4. What are two main reasons for long term break down in composite dielectrics?                   | 2,K2,CO2                     |
| 5. Summarize the specifications for standard impulse wave.  | 2,K2,CO3                     |
| 6. Outline the drawbacks of single stage circuit for the generation of very high impulse voltage. | 2,K1,CO3                     |
| 7. Explain the basic principle of Hall generator.   | 2,K1,CO4                     |
| 8. Define CVT.  | 2,K2,CO4                     |
| 9. What is meant by insulation coordination?  | 2,K1,CO5                     |
| 10. Compare type tests and routine tests.   | 2,K2,CO5                     |

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

11. a) Discuss the step by step by procedure for constructing Bewley's lattice diagram with an example. 13,K2,CO1
- OR**
- b) (i) Explain the mechanism of lightning strokes 8,K2,CO1  
(ii) Explain the technique of mathematical model of lighting over voltage. 5,K2,CO1
12. a) Explain briefly various theories of breakdown in commercial liquid dielectrics. 13,K2,CO2
- OR**
- b) Explain the various mechanism of vacuum break down. 13,K2,CO2

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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13. a) Explain the Marx circuit arrangement for multistage impulse generators. How is the basic arrangement modified to accommodate the wave time control resistances? 13,K2,CO3
- OR**
- b) What is the principle behind the electrostatic energy conversion methods? Explain the construction, operation, application and limitation of Van de Graff generator. 13,K2,CO3
14. a) Explain briefly the Electrostatic Voltmeter. Also list the advantages and disadvantages. 13,K2,CO4
- OR**
- b) With neat sketch explain the sphere gap arrangement method of high voltage measurement and give the factors influencing the measurement. 13,K2,CO4
15. a) Demonstrate with neat diagram explain the various HV testing carried out on Insulators. 13,K2,CO5
- OR**
- b) Explain briefly the various tests to be carried out on a bushing. 13,K2,CO5

**PART - C (1 × 15 = 15 Marks)**

16. a) (i) A Rogowski coil is required to measure impulse current of 8 kA having rate of change of current of  $10^{10}$  A/sec. The voltmeter is connected across the integrating circuit which reads 8 volts for full scale deflection. The input to the integrating circuit is from the Rogowski Coil. Determine the mutual inductance of coil, R and C of the integrating circuit. 8,K2,CO4
- (ii) Demonstrate the arrangement and detailed procedure for impulse voltage testing of power transformer. 7,K2,CO5
- OR**
- b) (i) Compare the performance of capacitance and mixed R-C potential dividers for measurement of impulse voltages. 8,K2,CO4
- (ii) Discuss the direct testing of circuit breakers in detail. 7,K2,CO5