B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022

Seventh Semester

Electrical and Electronics Engineering

15 DEC 2022

EE8701 - HIGH VOLTAGE ENGINEERING

(Regulations 2017)

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)
Answer ALL Questions

		Marks, K-Level, CO
1.	Define back flashover.	2,K1,CO1
2.	What are the causes for power frequency and its harmonic over voltages?	2,K1,CO1
3.	What do you mean by 'Intrinsic strength' of a solid dielectric?	2,K1, CO2
4.	Define Paschen's law.	2,K1, CO2
5.	Outline the drawbacks of single stage circuit for the generation of very high impulse voltage.	2,K1, CO3
6.	Give the basic principle of electrostatic generator.	2,K2,CO3
7.	Comment the effect of nearby earthed objects on the measurements using sphere Gaps.	2,K2,CO4
8.	What are the problems associated with measurement of very high impulse voltages?	2,K2, CO4
9.	Compare type tests and routine tests.	2,K2,CO5
10.	What is meant by insulation coordination?	2,K1,CO5

PART - B (5 × 13 = 65 Marks)
Answer ALL Questions

11. a) (i) Explain the different theories of charge formation in clouds.   7, K2,CO1

     (ii) Explain the operation of expulsion gap lightning arrester along with advantages and disadvantages.   6, K2, CO1

OR

   b) Discuss the step by step by procedure for constructing Bewley's lattice diagram with an example.   13,K2, CO1

12. a) Explain briefly various theories of breakdown in commercial liquid dielectrics.   13,K2, CO2

OR

   b) Explain the various theories of breakdown in Gaseous dielectric.   13,K2,CO2

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **11471**

13. a) Explain the Marx circuit arrangement for multistage impulse 13,K2,CO3 generators. How is the basic arrangement modified to accommodate the wave time control resistances?

OR

b) A ten stage Cockcroft - Walton circuit has all capacitors of 0.04 μF. 13,K2,CO3 The secondary voltage of the supply transformer is 120 kV at a frequency of 150 Hz. If the load current is 1.2 mA, determine (i) voltage regulation (ii) the ripple (iii) the optimum number of stages for maximum output voltage (iv) the maximum output voltage.

14. a) Explain briefly the Electrostatic Voltmeter. Also list the advantages 13,K2,CO4 and disadvantages.

OR

b) Explain the capacitor potential divider method for measurement of 13,K2,CO4 HVAC.

15. a) Explain briefly the various tests to be carried out on a bushing. 13,K2,CO5

OR

b) (i) What is meant by 50% disruptive discharge as applied to impulse 6,K2,CO5 voltage? Discuss the procedure of two important methods to obtain the same.

(ii) Explain the procedure adopted for detection and location of fault in 7,K2,CO5 a transformer during impulse testing.

PART - C (1 × 15 = 15 Marks)

16. a) Describe the construction, principle of operation of a generating 15,K2,CO4 voltmeter method and give its applications and limitations.

OR

b) Demonstrate with neat diagram explain the various HV testing carried 15,K2,CO5 out on Insulators.