

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

Seventh Semester

Electrical and Electronics Engineering

EE3701 - High Voltage Engineering

Regulations - 2021

Duration : 3 Hrs

Maximum : 100 Marks

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BLT	CO	Marks
1.	Define internal and external overvoltage.	L1	1	2
2.	Why are transmission lines more vulnerable to lightning-induced overvoltage?	L2	1	2
3.	Name two factors that affect the dielectric strength of a material.	L1	2	2
4.	How can dielectric breakdown be prevented in insulation systems?	L2	2	2
5.	Recall the methods used to generate high DC voltages.	L1	3	2
6.	Write the advantage of using capacitive voltage dividers in high-voltage generation.	L1	3	2
7.	How is a wet test different from a dry test in high-voltage applications?	L2	4	2
8.	Describe the purpose of a corona test in high-voltage testing.	L2	4	2
9.	List the main functions of smoke and particle detectors in industrial environments.	L1	5	2
10.	What safety precautions are necessary when working with ozone in an industrial environment?	L2	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No	Questions	BLT	CO	Marks
11.	a Explain in detail the origin and characteristics of switching surges and explain the causes of over voltage due to switching surges in EHV and UHV system with a suitable.	L2	1	16
	Or			
	b Summarize the wave equation of travelling waves in transmission line and also discuss the behavior of travelling waves in open circuited transmission.	L3	1	16
12.	a i Explain the Townsend's first and second ionization processes.	L2	2	10
	ii Explain various mechanisms of Vacuum breakdown.	L2	2	6

Or

	b i	Extend "stressed oil volume theory", and how does it explain breakdown in large volumes of commercial liquid dielectrics?	L3	2	8
	ii	Explain in detail any one mechanism of breakdown in solid dielectrics.	L2	2	8
13.	a	With a neat sketch explain the Cockcroft – Walton voltage multiplier circuit for generation of high DC voltages.	L3	3	16
		Or			
	b i	Give the Marx circuit arrangement for multistage impulse generators. How is the basic arrangement modified to accommodate the wave time control resistances?	L3	3	8
	ii	With a neat diagram explain the sphere gap arrangement method of HV measurement in detail and give the factors influencing the measurements.	L2	3	8
14.	a i	Demonstrate the power frequency and impulse voltage test need to be conducted on bushings with necessary diagrams.	L2	4	8
	ii	Briefly discuss the various tests carried out the insulator.	L2	4	8
		Or			
	b	Briefly explain short circuit plant pertaining to testing of CB.	L2	4	16
15.	a i	Contrast the process of electrostatic separation and its industrial applications.	L2	5	8
	ii	Develop the safety precautions necessary when using electrostatic spray equipment.	L3	5	8
		Or			
	b i	Describe the curing process in sandpaper manufacturing and its purpose.	L3	5	8
	ii	Describe the principle of electrostatic forces in electro spinning.	L3	5	8