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KAMALA INSTITUTE OF TECHNOLOGY & SCIENCE, SINGAPUR

23EE28PE512

III. B. Tech I. Semester Regular Examinations, November-2025

HIGH VOLTAGE ENGINEERING

(EEE)

Time: 3 Hours

Max.Marks:60

Note: Question paper consists of Part-A & Part-B.

i) **Part-A** for 10M, ii) **Part-B** for 50marks

- Part A** is compulsory, consists of 10 sub questions from all units carrying equal marks.
- Part-B** consists of **10 questions** (numbered from 2 to 11) carrying **10marks** each. From each unit there are 2 questions and the students should answer one of them. Hence the student should answer **5 questions** from **Part-B**.

PART-A(10Marks)			
Q.No	Questions	Marks	BTL
1.a)	State Townsend's criteria of breakdown in gases	1	1
1.b)	What causes breakdown in solid dielectrics?	1	1
1.c)	Define the need for generating high voltages	1	1
1.d)	What do you mean by tripping in impulse generators?	1	1
1.e)	State two conditions to be satisfied by a potential divider to be used for impulse voltage measurement	1	1
1.f)	Define dielectric constant and dielectric loss factor	1	1
1.g)	Name the over voltages due to switching surges	1	1
1.h)	What is a surge diverter?	1	1
1.i)	List any two international standards used for high voltage testing	1	1
1.j)	Mention the electrical tests for isolators and circuit breakers	1	1

PART-B(50Marks)

Q.No	Questions	Marks	BTL
2. a)	Explain the process of gaseous breakdown in uniform fields with relevant equations and diagrams	5M	2
b)	Explain corona discharge, its formation, advantages, disadvantages and effects on power systems	5M	2
OR			
3. a)	Discuss conduction and breakdown mechanisms in pure and commercial insulating liquids	5M	3
b)	Explain different insulating materials used in rotating machines	5M	2
OR			
4. a)	Explain the generation of high DC voltage using a Cockcroft-Walton circuit with neat diagram	5M	2
b)	Explain different methods for generation of high frequency AC voltages	5M	2
OR			
5. a)	Explain the analysis of a standard impulse generator circuit	5M	2
b)	Explain the tripping and control mechanisms used in impulse voltage generation setups	5M	2
OR			
6. a)	Explain briefly different methods used for peak voltage measurement in high-voltage systems	5M	2
b)	Explain the working of a generating voltmeter used for high DC voltage measurement	5M	2
OR			
7. a)	Explain cathode ray oscillographs for measuring impulse voltage	5M	2
b)	Explain the phenomenon of partial discharge and its significance in insulation testing	5M	2

8. a)	Explain the different theories of charge formation in clouds	5M	2
b)	Distinguish the difference between a stepped leader and a dart leader	5M	3
OR			
9. a)	Explain the need for over-voltage protection in power systems	4M	2
b)	Describe the function of surge modifiers in controlling the magnitude and shape of over-voltage transients	6M	3
OR			
10.a)	Explain the different power frequency tests performed on insulators and their significance	5M	2
b)	Explain the partial discharge tests on high-voltage cables	5M	2
OR			
11.a)	Explain the method of impulse testing of high voltage transformers	5M	2
b)	Explain the general layout and essential components of a high-voltage laboratory	5M	2

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