PAPER ID-310256

Subject Code: KEE073

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM VII) THEORY EXAMINATION 2024-25
HIGH VOLTAGE ENGINEERING

TIME: 3 HRS **M.MARKS: 100**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Q no.	Question	CO	Level
a.	Define Paschen's Law and its significance?	1	K1
b.	What is Townsend's Criterion for Breakdown?	1	K1
c.	How are high direct current voltages generated?	2	K2
d.	What is the principle of an impulse generator?	2	K2
e.	How is high DC voltage measured?	3	K2
f.	What are the limitations of a Cathode Ray Oscillograph in high voltage measurement?	3	K2
g.	What are the natural causes of overvoltages in power systems?	4	K2
h.	Explain the role of insulation coordination in high voltage systems.	4	K2
i.	Define partial discharge and its significance in electrical testing.	5	K2
j.	How is the dielectric constant of a material measured?	5	K2

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

a.	Derive Townsend's Current Growth Equation and explain its significance.	1	K1
b.	Explain the method of generation of high DC voltages with suitable diagrams.	2	K2
c.	Explain the measurement techniques for high DC voltages.	3	K2
d.	Explain the overvoltage phenomena caused by lightning and its mitigation methods.	4	K2
e.	Discuss the methods for measuring the dielectric constant and loss factor of materials.	5	K2

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Discuss the Streamer Theory of Breakdown in Gases with necessary diagrams.	1	K1
b.	Explain the conduction and breakdown mechanism in pure and commercial liquids.	1	K1

4. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Discuss the techniques for generating high alternating voltages.	2	K2
b.	Describe the generation of impulse voltages and the factors affecting it.	2	K2

5. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Discuss the methods for measuring high alternating and impulse voltages.	3	K2
b.	Describe the use of Cathode Ray Oscillographs in high voltage and current measurement.	3	K2

6. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Discuss the principles of insulation coordination for high voltage systems.	4	K2
b.	Describe the effects of switching surges on power systems.	4	K2

7. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Explain the process and importance of partial discharge measurements.	5	K2
b.	Describe the testing procedures for transformers in high voltage systems.	5	K2