

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID-SEMESTER EXAMINATION)**

**CLASS: BTECH
BRANCH: EEE**

**SEMESTER: VII
SESSION: MO/2024**

SUBJECT: EE593 HIGH VOLTAGE ENGINEERING

TIME: 02 Hrs.

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

			CO	BL
Q1	(a) What are the different types of voltages occurring in high voltage practice?	[2]	1	1
	(b) Explain the two essential conditions to be satisfied for a collision of an electron with an atom to be an ionising one.	[3]	1	2
Q2	Explain the processes of current growth and breakdown in electronegative gases.	[5]	3	4
Q3	In an experiment in a certain gas, the steady state current is 5.5×10^{-8} A at 8 kV at a distance of 0.4 cm between the plane electrodes. Keeping the field constant and reducing the distance to 1 mm result in a current of 5.5×10^{-9} A. Calculate Townsend's primary ionisation coefficient. If the breakdown occurred when the gap distance was increased to 9 mm, what is the value of Townsend's secondary ionisation coefficient?	[5]	1, 3	4
Q4	(a) What is Paschen's law?	[2]	3,4	1
	(b) What is meant by the withstand strength of an insulation? Are the withstand strength and breakdown strength constant for an insulating material?	[3]	1,2,4	2
Q5	What is a vacuum? How is it categorized? What is the usual range of vacuum used in high voltage apparatus? What are the factors affecting the breakdown voltage of a vacuum gap?	[5]	1, 3	2

:.....19/09/2024:.....M