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

CLASS: BE   SEMESTER: VII
BRANCH: EEE   SESSION : MO/2019

SUBJECT : EE8215 HIGH VOLTAGE ENGINEERING

TIME: 1.5 HOURS   FULL MARKS: 25

INSTRUCTIONS:
1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

Q1 (a) What are the different types of voltages occurring in high voltage practice?   [2]
    (b) Explain the two important conditions to be satisfied for a collision of an electron with an   [3]
         atom to be ionizing one.

Q2 (a) Explain the term "electron attachment".   [2]
    (b) Explain the difference between photo-ionisation and photo-electric emission.   [3]

Q3   Explain the processes of breakdown in electronegative gases.   [5]

Q4   In an experiment in a certain gas it was found that the steady state current is 5.5×10^{-8}A at 8kV at a distance of 0.4 cm between the plane electrodes. Keeping the field   [5]
         constant and reducing the distance to 0.1cm result in a current of 5.5×10^{-9}A. Calculate
         Townsend's primary ionization coefficient. If the breakdown occurred when the gap
         distance was increased to 0.9cm, what is the value of Townsend's secondary ionization
         coefficient?

Q5 (a) Give difference between pure and commercial liquids used for insulation purpose.   [2]
    (b) Why are both electrical and thermal properties important for liquid for use in an   [3]
         apparatus like a transformer?

Q6   In an experiment for determining the breakdown strength of transformer oil with   [5]
         standard electrode, the following observations were obtained. Determine the power law
         for breakdown and hence estimate the break down strength for a 1cm gap (kv/cm).

Gap Spacing (mm)	3	6	9	10
Breakdown Voltage (kV)	86	148	169	219

::::: 20/09/2019M :::::::