Total No. of Questions : 6] **SEAT No. :**

P595

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BE/Insem/APR - 193
B.E. (Electrical)
HIGH VOLTAGE ENGINEERING
(2015 Pattern) (Semester - II) (Elective - III)

Time : 1 Hour] ***[Max. Marks : 30***

Instructions to the candidates :

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6.***
2) ***Use of non programmable calculator is allowed.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Unit - I

Q1) a) Compare between Townsend's and Streamer breakdown mechanism. **[7]**

b) Draw Paschen's curve and explain the law. **[3]**

OR

Q2) a) Derive current growth equation in presence of primary and secondary ionization processes. **[6]**

b) In an experiment in a certain gas, it was found that the steady state current is 5.5×10^{-9}A at 8 kV at a distance of 0.4 cm between plane electrodes keeping the field constant and reducing the distance to 0.1 cm result in a current of 5.5×10^{-9}A. Calculate Townsend's primary ionization coefficient α. If the breakdown occurred when the gap distance was increased to 0.9 cm what is the value of Townsend's secondary ionization coefficient? **[4]**

Unit - II

Q3) a) Describe Thermal mechanism of breakdown in solid insulating materials. **[6]**

b) A solid dielectric material with dielectric constant of 4.8 has void of thickness 1 mm. The dielectric material thickness is 1 cm and the voltage applied across it is 100 kV(rms). If void is filled with air and has dielectric strength of 30 kV/cm (peak). Find the voltage at which internal discharge can occur. **[4]**

OR

P.T.O.

Q4) a) Define following : **[3]**

i) Impulse waveform

ii) Wave front time

iii) Wave tail time

b) Draw a neat diagram of Tesla coil and explain principle of operation, construction, advantages and disadvantages. **[7]**

Unit - III

Q5) a) Draw any one scheme of Tripping and control of impulse generators and explain it. **[5]**

b) Draw modified Marx circuit of impulse generator. Explain its construction and operation. **[5]**

OR

Q6) a) What is the use of series resonance circuit? How it works? Write down advantages and disadvantages. **[7]**

b) Draw a standard impulse waveform and define it as per IS. **[3]**

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