

Benha University		Time : 45 minutes
Faculty of Engineering (Shoubra)		High Voltage Engineering
Electrical Engineering Dept. 24 March, 2012		Third Year (Power) Mid Term Exam.

Question One (10 points)

- A. The breakdown in uniform field gas has different criterion on that non-uniform field gaps. For non-uniform field gaps there is pre-breakdown phenomena; According to this statement discuss about;
- i) the pre-breakdown phenomena.
 - ii) The post-breakdown phenomena.
 - iii) the time lag of breakdown.
- B. Mention the preferred properties which must be satisfied of a gaseous dielectric for high voltage applications.
- C. A knowledge of electric fields is necessary in numerous applications in the design and operation of electrical and electronic equipment. Enumerate a few of these applications.

Question Two (10 points)

In an experiment to measure the first ionization coefficient for a given gas, it was found that the steady state current is 2.7×10^{-8} A at a voltage of 10kV and a spacing of 0.005m between the plane electrodes. With the spacing increased to 0.01m, the current increases to 2.7×10^{-7} A for the same electric field between the electrodes. Calculate;

- a) The first Townsend ionization coefficient. **(3points)**
- b) The number of electrons emitted from the cathode per second. **(3points)**
- c) The electrode spacing that would result in an electron multiplication of 10^9 . **(4points)**