FACULTY : SCG | **ASSIGNMENT #3** | PHY 108

DATE OF SUBMISSION: 14 DECEMBER 2022 | TOTAL POINTS : 10

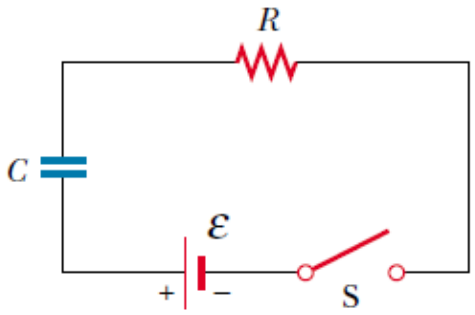
Instructions:

1. Write clearly with a pen.
2. Show step-by-step calculations.
3. Upload the answer script to Canvas.
4. No late submission will be accepted.

#1. [4 points] For the following circuit, $C = 220\ \mu F\ and$ the emf of the battery $\mathcal{E} = 63\ V$. The switch of the circuit is turned on, and after 12.5 s, the capacitor voltage becomes 25 V.

(a) Find the value of the resistor in the circuit.

(b) Find the energy stored in the capacitor when the circuit reaches its equilibrium.



#2. [3 points] In a certain cyclotron, a proton moves in a circle of radius 0.20 m and the magnitude of the magnetic field is 0.75 T.

(a) What is the frequency of oscillation?

(b) What is the kinetic energy of the proton in electron-volt (eV)?

#3. [3 points] A wire of length 100 m is formed into a circular coil of 20 turns, and a current of 200 mA passes through it. If a magnetic field of 1.2 T is directed parallel to the plane of the coil

(a) Find the magnetic dipole moment of the loop.

(b) What is the magnitude of the torque exerted on the coil by the magnetic field?