Bangladesh University

Department of CSE
Final Examination, Summer Semester 2025
Course Code: CSE-1301
Course Title: Physics
Batch: 69th Batch (Evening)

Time: 2.0 hours | Total Marks: 40

Question No. 1: **[2+4+4]**

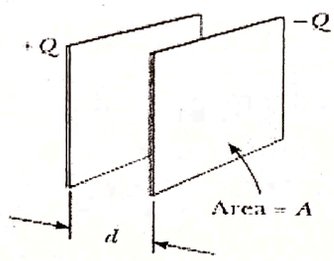


Fig 1

a. Define Capacitor.
b. Derive the equation for the capacitance for the capacitor given in Fig 1.
c. How much charge is stored in a capacitor consisting of two concentric spheres of radius 30 cm and 31 cm if the potential difference is 500V.

Question No. 2: **[2+4+4]**

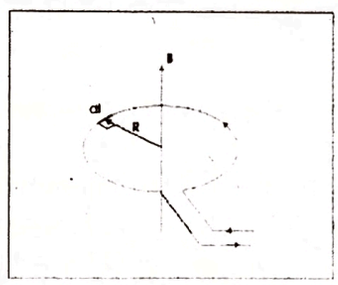


Fig 2

a. Briefly explain the right-hand thumb rule of circular currents.
b. Determine the magnetic field for the Fig 2
c. A proton is projected in positive y-direction with a speed of **3i** m/s in a magnetic field of **(2i+3j)** x 10^{-6} T. Determine the force experienced by the particle.

Question No. 3: **[2+4+4]**

a. Define Lorentz force.
b. An electron moving with a velocity 3×10^{7} m/s in a magnetic field of 5×10^{-3} T. If magnetic field are perpendicular to each other, then find the acceleration of the electron.
c. Explain the application of Faraday's Law

Question No. 4: **[2+4+4]**

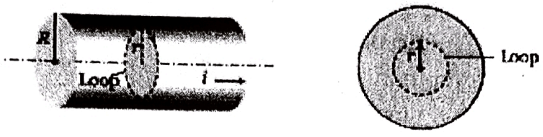


Fig 4

a. State and explain Amperes Law.
b. Derive the magnetic field at the point shown in the figure 4.
c. Two conducting wires that are each carrying currents of 50A and 70A repeal one another with a force of 0.25 N/m. Find the distance between them.

Question No. 5: **[2+4+4]**

a. Define self-induction and 1 Henry.
b. A conductor is moved at a velocity of 5 m/s at an angle of 60° to a uniform magnetic field of 1.6 mWb. The field is produced by a pair of pole pieces, the faces of which measure 10 cm by 4 cm. If the conductor length is parallel to the longer side of the field, calculate the emf induced.
c. Derive the Mathematical representation of Mutual Induction.