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School of Basic Sciences
Bachelor of Science Honours in Physics
Mid Term Examination - May 2024

Duration : 90 Minutes
Max Marks : 50

Sem II - C1UD203B - Electricity and Magnetism

General Instructions

Answer to the specific question asked

Draw neat, labelled diagrams wherever necessary

Approved data hand books are allowed subject to verification by the Invigilator

- 1) Explain the equation related to electric flux. K2 (2)
- 2) State the uniqueness theorem in electrostatics. K1 (3)
- 3) State Gauss' Law and its application to charge distributions with spherical symmetry. K2 (4)
- 4) Show that the electrical susceptibility of a material affects the application of material? K2 (6)
- 5) A non-conducting sphere of radius 6 cm carries a charge of $-8 \mu\text{C}$ distributed uniformly throughout its volume. Determine the electric field at a point on the surface of the sphere. K3 (6)
- 6) What is the direction of an electric dipole moment? K3 (9)
- 7) Apply Gauss' Law to determine the electric field and electric potential due to a uniformly charged infinite plane sheet. K4 (8)
- 8) A parallel-plate capacitor with plate area 0.1 m^2 and plate separation 2 mm is connected to a battery with a potential difference of 12 V. Calculate the energy stored in the capacitor. K4 (12)

OR

- A conductor is placed in an electrostatic field with a surface charge density of $10 \mu\text{C}/\text{m}^2$. Determine the force experienced by the conductor if its area is 0.5 m^2 . K4 (12)