GALGOTIAS UNIVERSITY

School of Basic Sciences
Bachelor of Science Honours in Physics
Mid Term Examination - Nov 2023

Duration : 90 Minutes
Max Marks : 50

Sem III - C1UD303B - 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 µC 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 m² 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 µC/m². Determine the force experienced by the conductor if its area is 0.5 m².   K4 (12)