

NORTH GAUHATI COLLEGE
DEPARTMENT OF PHYSICS
B.SC. 3RD SEMESTER (MAJOR) NON-CBCS
SUB: ELECTROSTATICS (301)
ASSIGNMENT - I

LAST DATE OF SUBMISSION: August 10, 2021

TOTAL MARKS: 15

The figures in the brackets indicate the full marks for each question

- 1.** Find the electric field a distance z above the midpoint of a straight line segment of length $2L$, which carries a uniform line charge λ . **[3]**
- 2.** Find the potential inside and outside a spherical shell of radius R , having charge q . **[3]**
- 3.** (a) What is a dielectric? Give an example.
(b) How is Gauss's law modified in the presence of a dielectric? **[3]**
- 4.** Derive the expressions for electric field and potential of a dipole. **[3]**
- 5.** A uniform line charge, infinite in extent, having charge per unit length 20×10^{-9} C/m lies along the z -axis. Find the electric field E at $(6,8,3)$. **[3]**

General instructions for submission:

- ★ Write your answers in **A4 size paper** clearly mentioning your **name, GU roll number, registration number, paper code, email address**, etc. on the **first page** of your answer sheets.
- ★ You need to make a **single PDF file** of your assignments and **upload** them on the **online portal of our college** (by clicking the 'upload' button next to the 'view' button on the assignment page).
- ★ Only if you are **unable to upload** on the website, you may send the assignment mentioning proper **course code and assignment number** as **subject** to the email: **ngcphysicsdept@gmail.com**