

In The Name Of God

Assignment number 6 of Electromagnetics 1

Spring 2020

1. Please answer the following questions from “Introduction to Electrodynamics” by D.J. Griffiths (fourth edition):

- 4.2
- 4.13
- 4.18
- 4.28
- 4.41
- 4.43

2. Please answer the following questions from “*Electricity and Magnetism*” by M.H. NAYFE:

2.1 :

Consider an infinite dielectric that is homogeneous and has a uniform polarization \mathbf{P} . A spherical cavity is now introduced in it. Determine the electric field \mathbf{E} in the cavity when the introduction of the cavity (a) does not change the polarization in the surrounding dielectric (as happens in electrets—see Chapter 5) and (b) changes the polarization as a result of the changes in the electric field $\mathbf{P} = (\varepsilon - \varepsilon_0)\mathbf{E}$ (as happens in normal dielectrics).

2.2 :

Two parallel capacitor plates enclose a dielectric material that has a spatially varying dielectric constant, $K = e^{\alpha x}$, where α is a constant (see Fig. 4.17). Find the electric field $E(x)$ inside the plates when they are charged to a potential difference V .

