Department of Physics, Shiv Nadar Institution of Eminence

Spring 2025

PHY102: Introduction to Physics-II

Tutorial – 6

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1. Three charges, Q, +q and +q, are placed at the vertices of a right-angled isosceles triangle as shown. Find Q if the net electrostatic potential energy of the configuration is zero.

2. A spherical conducting shell of radius a, centered at the origin, has a potential field

$$V = \begin{cases} V_0 & r \leq a \\ \dfrac{V_0 a}{r} & r > a \end{cases}$$

with the zero reference at infinity. Find an expression for the stored energy that this potential represents?

3. Consider two concentric spherical shells of radii a and b. Suppose the inner one carries a charge q, and the outer one a charge −q (both of them uniformly distributed over the surface). Calculate the energy of this configuration?