

Answer on Question #40903, Physics, Electromagnetism

An electric charge $q = 10^{-3} \mu C$ is placed at the origin $(0, 0)$ of X-Y coordinate system. Two points A and B are situated at $(\sqrt{2}, \sqrt{2})$, and $(2, 0)$ respectively. The potential difference between the points A and B will be :- (1)9 volt (2)Zero (3)2 volt (4)3.5 volt

Solution

The distance between the points A and the origin is

$$r_A = \sqrt{(\sqrt{2} - 0)^2 + (\sqrt{2} - 0)^2} = 2.$$

The distance between the points B and the origin is

$$r_B = \sqrt{(2 - 0)^2 + (0 - 0)^2} = 2.$$

As the points A and B are at the same distance from the charge q , they are at same potential. Hence potential difference between the points A and B is zero.

Answer: (2)Zero.