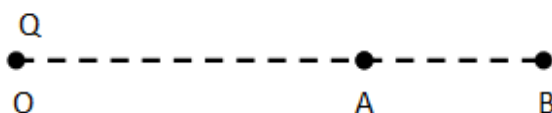




Q1. A point charge Q is placed at point O as shown in the figure, is the potential difference $V_A - V_B$ positive, negative or zero, if Q is (i) positive (ii) negative?

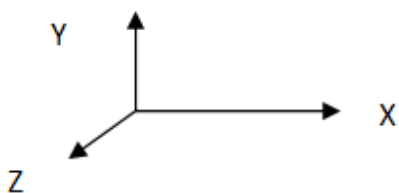


Answer: We know that potential at point due to a point charge V is given by

$V = \frac{Q}{4\pi\epsilon_0 r}$	$V_A = \frac{Q}{4\pi\epsilon_0 (OA)}$	$V_B = \frac{Q}{4\pi\epsilon_0 (OB)}$
When Q is positive, $OA < OB$	$V_A > V_B$	(i) $V_A - V_B$ is positive.
When Q is Negative, $OA < OB$	$V_A < V_B$	(ii) $V_A - V_B$ is Negative

Q2. A plane electromagnetic wave travels in vacuum in z – direction. What can you say about the direction of electric and magnetic field vectors?

Answer: We know that the direction of propagation of electromagnetic wave is perpendicular to the plane containing electric vector \vec{E} and magnetic vector \vec{B} . Considering the right handed system of axis



Direction of propagation is given by $\vec{E} \times \vec{B}$.

Therefore if direction of propagation is along Z axis then \vec{E} is along X -axis, \vec{B} is along Y -axis.