

XII (ANSWER KEY)

PHYSICS

Date: April 26, 2024.

Q1-5 (MCQs).

1. (a)

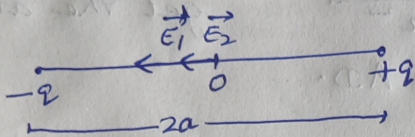
2. (c)

3. (a)

4. (c)

5. (b)

6.



$$\vec{E}_1 = \frac{1}{4\pi\epsilon_0} \frac{2}{a^2} (-\hat{i})$$

$$\vec{E}_2 = \frac{1}{4\pi\epsilon_0} \frac{2}{a^2} (-\hat{i})$$

$$\vec{E}_{\text{net}} = \vec{E}_1 + \vec{E}_2 = \frac{1}{4\pi\epsilon_0} \frac{2 \cdot 2}{a^2} (-\hat{i})$$

7. Electric Flux: No. of electric field lines passing through surface normally.

SI unit: Nm^2C^{-1}

No effect.

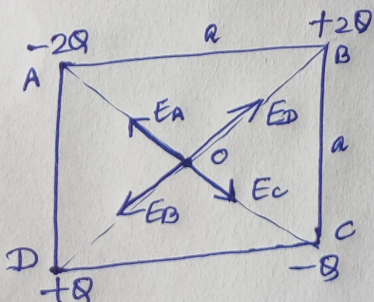
8. $a = \frac{qE}{m}$; $t = \frac{L}{v}$

$$y = u_y t + \frac{1}{2} a t^2$$

$$y = 0 + \frac{1}{2} \frac{qE}{m} \frac{L^2}{v^2}$$

$$y = \frac{qEL^2}{2mv^2}$$

9.



$$E_A = \frac{k \cdot 2Q}{\left(\frac{a}{\sqrt{2}}\right)^2} = \frac{4kQ}{a^2}$$

$$E_B = \frac{kQ}{\left(\frac{a}{\sqrt{2}}\right)^2} = \frac{2kQ}{a^2}$$

$$E_C = \frac{kQ}{\left(\frac{a}{\sqrt{2}}\right)^2} = \frac{2kQ}{a^2}$$

$$E_D = \frac{k \cdot 2Q}{\left(\frac{a}{\sqrt{2}}\right)^2} = \frac{4kQ}{a^2}$$

$$E' = E_A - E_C = \frac{2kQ}{a^2} \quad \text{along } OA$$

$$E'' = E_D - E_B = \frac{2kQ}{a^2} \quad \text{along } OB$$

$$E_{\text{net}} = \sqrt{(E')^2 + (E'')^2} = \frac{\sqrt{2} \cdot 2kQ}{a^2} \quad \text{Put the values \& get the answer.}$$

Direction: Parallel to BC or AD.

- 10.
1. (c)
 2. (a)
 3. (a)

————— x —————

