Physicsaholics

DPP - 2 (Electrostatics)

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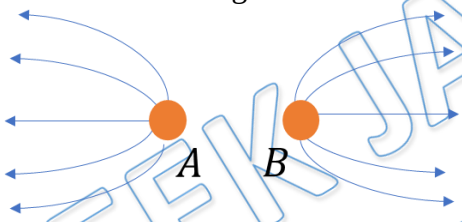
Q 1. Unit of electric field intensity is:
(Where N = Newton, and C = Coulomb)
(a) NC (b) N/C
(c) NC^2 (d) N/C^2

Q 2. Fig. shows electric lines of force due to point charges q_1 and q_2 placed at points A and B respectively. Write the nature of charge on them:



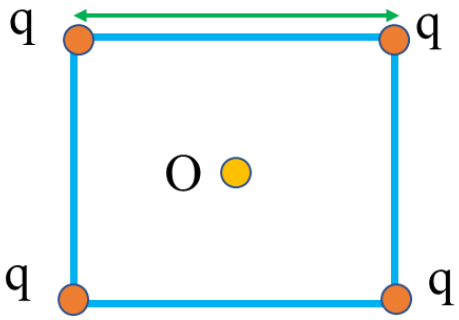
(a) q_1=positive, q_2 = negative (b) q_1= negative, q_2 = positive
(c) both are positive (d) both are negative

Q 3. A test charge +5C experiences a net force of 20 N due to electric field at a point A in an electric field region. What is the net electric field intensity at point A?
(a) 5 N/C (b) 4 N/C
(c) 5 N/C^2 (d) cannot be determined

Q 4. Which among the following statements is true with regard to electric field lines?
(a) Electric field lines always intersect
(b) Electric field lines may or may not intersect
(c) Electric field lines can be seen
(d) Electric field lines never intersect

Q 5. The conventional direction of electric field is:
(a) Positive charge to negative charge
(b) Negative charge to positive charge
(c) No specific direction
(d) Direction cannot be determined

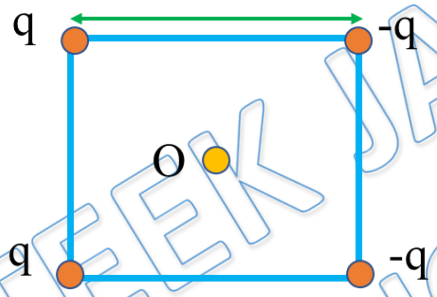
Q 6. Calculate the electric field intensity at the centre 'O' of square?



(a) $\frac{kq}{d^2}$ (b) $\frac{2kq}{d^2}$

(c) zero (d) None of these

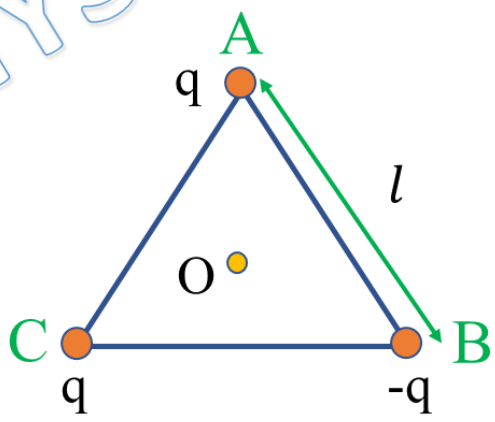
Q 7. Calculate the electric field intensity at the centre 'O' of square?



(a) $\frac{kq}{d^2}$ (b) $\frac{2\sqrt{2}kq}{d^2}$

(c) $\frac{4\sqrt{2}kq}{d^2}$ (d) None of these

Q 8. Calculate the magnitude of electric field intensity at the centroid of equilateral triangle, and its direction?



(a) $\frac{3kq}{l^2}$ towards A (b) $\frac{6kq}{l^2}$ towards B

(c) $\frac{2kq}{l^2}$ towards B (d) None of these

Q 9. The maximum electric field intensity on the axis of a uniformly charged ring of charge Q and radius R will be?

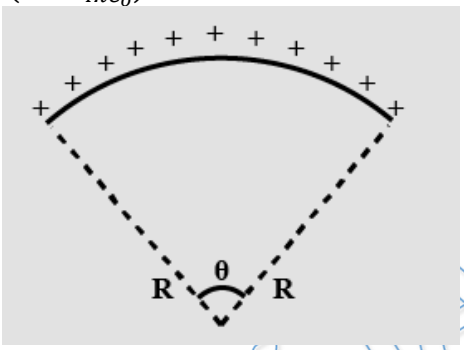
(a) $\frac{1}{4\pi\varepsilon_o}\frac{Q}{(3\sqrt{3}R^2)}$

(b) $\frac{1}{4\pi\varepsilon_o}\frac{2Q}{(3R^2)}$

(c) $\frac{1}{4\pi\varepsilon_o}\frac{2Q}{(3\sqrt{3}R^2)}$

(d) $\frac{1}{4\pi\varepsilon_o}\frac{3Q}{(2\sqrt{2}R^2)}$

Q 10. A charge '+Q' is uniformly distributed along the circular arc of radius 'R' as shown in the figure. The magnitude of the force experienced by the point charge +q placed at the centre of curvature is $\left(k = \frac{1}{4\pi\varepsilon_o}\right)$



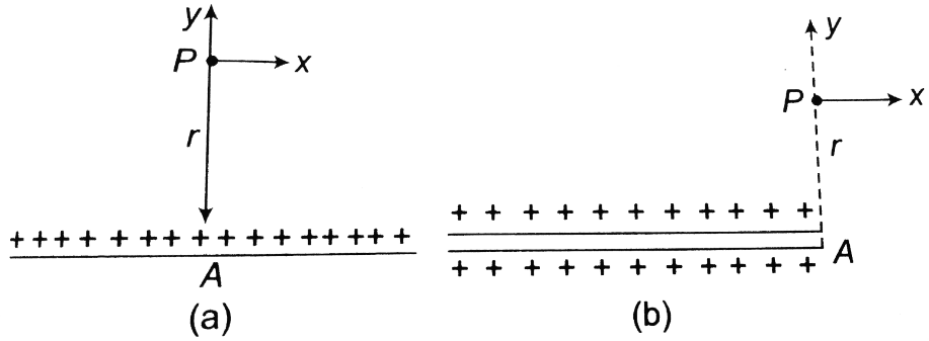
(a) $\frac{kQq\sin\left(\frac{\theta}{2}\right)}{(R^2\theta)}$

(b) $\frac{2kQq\sin\left(\frac{\theta}{2}\right)}{(R^2\theta)}$

(c) $\frac{3kQq\sin\left(\frac{\theta}{2}\right)}{(R^2\theta)}$

(d) $\frac{2kQq\sin\left(\frac{\theta}{2}\right)}{(R\theta)}$

Q 11. Electric field , due to an infinite line of change, as shown in figure at a point P at a distance r from the line is E. If wire is folded at point A, so that both parts lie alongside as shown in figure(b), then express electric field at P in vector form:



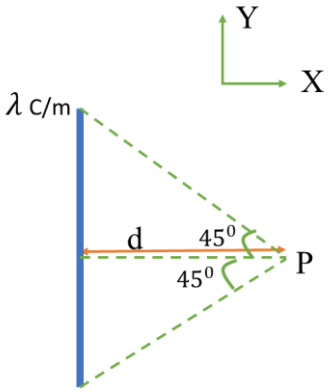
(a) $\frac{E}{2}\hat{\imath} + \frac{E}{2}\hat{\jmath}$

(b) $E\hat{\imath} + E\hat{\jmath}$

(c) $\sqrt{2}E\hat{\imath} + \sqrt{2}E\hat{\jmath}$

(d) $\frac{E}{\sqrt{2}}\hat{\imath} + \frac{E}{\sqrt{2}}\hat{\jmath}$

Q 12. Linear charge density of finite charged wire is $+\lambda\ C/m$ (where λ is a positive constant). Find electric field intensity at point 'P': $\left(k = \frac{1}{4\pi\varepsilon_o}\right)$



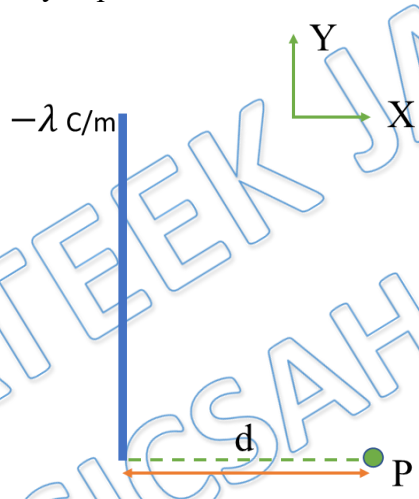
(a) $\frac{\sqrt{2}k\lambda}{d}\hat{\imath}$

(b) $\frac{\sqrt{2}k\lambda}{d}\hat{\imath} - \frac{\sqrt{2}k\lambda}{d}\hat{\jmath}$

(c) $\frac{\sqrt{2}k\lambda}{d}\hat{\imath} - \frac{k\lambda}{d}\hat{\jmath}$

(d) $\frac{\sqrt{2}k\lambda}{d}\hat{\imath} + \frac{\sqrt{2}k\lambda}{d}\hat{\jmath}$

Q 13. Linear charge density of finite charged wire is $-\lambda\, C/m$ (where λ is positive constant). Find electric field intensity at point 'P':



(a) $-\frac{k\lambda}{d}\hat{\imath} - \frac{k\lambda}{d}\hat{\jmath}$

(b) $\frac{k\lambda}{d}\hat{\imath} - \frac{k\lambda}{d}\hat{\jmath}$

(c) $\frac{k\lambda}{d}\hat{\imath} + \frac{k\lambda}{d}\hat{\jmath}$

(d) $-\frac{k\lambda}{d}\hat{\imath} + \frac{k\lambda}{d}\hat{\jmath}$

Answer Key

Q.1 b	**Q.2 c**	**Q.3 b**	**Q.4 d**	**Q.5 a**
Q.6 c	**Q.7 c**	**Q.8 b**	**Q.9 c**	**Q.10 b**
Q.11 b	**Q.12 a**	**Q.13 d**		