LAKSHYA (JEE)

Electric Charges and Field

DPP-07

1. A charge q is placed at the center of the open end of cylindrical vessel. The flux of the electric field through the surface of the vessel is

(a) Zero (b) $\frac{q}{\varepsilon_0}$

(c) $\frac{q}{2\varepsilon_0}$ (d) $\frac{2q}{\varepsilon_0}$

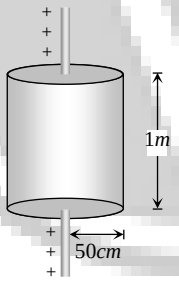
2. Electric charge is uniformly distributed along a long straight wire of radius 1*mm*. The charge per *cm* length of the wire is *Q coulomb*. Another cylindrical surface of radius 50 *cm* and length 1*m* symmetrically encloses the wire as shown in the figure. The total electric flux passing through the cylindrical surface is

(a) $\frac{Q}{\varepsilon_0}$

(b) $\frac{100Q}{\varepsilon_0}$

(c) $\frac{10Q}{(\pi\varepsilon_0)}$

(d) $\frac{100Q}{(\pi\varepsilon_0)}$



3. The inward and outward electric flux for a closed surface in units of $N\text{-}m^2/C$ are respectively 8×10^3 and 4×10^3. Then the total charge inside the surface is [where ε_0 = permittivity constant]

(a) $4\times10^3\ C$ (b) $-4\times10^3\ C$

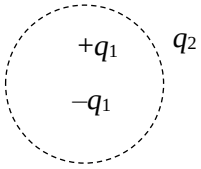
(c) $\frac{(-4\times10^3)}{\varepsilon}\ C$ (d) $-4\times10^3\varepsilon_0\ C$

4. If the electric flux entering and leaving an enclosed surface respectively is ϕ_1 and ϕ_2 the electric charge inside the surface will be **[AIEEE 2003]**

(a) $(\phi_1+\phi_2)\varepsilon_0$ (b) $(\phi_2-\phi_1)\varepsilon_0$

(c) $(\phi_1+\phi_2)/\varepsilon_0$ (d) $(\phi_2-\phi_1)/\varepsilon_0$

5. Consider the charge configuration and spherical Gaussian surface as shown in the figure. When calculating the flux of the electric field over the spherical surface the electric field will be due to **[IIT-JEE Screening 2004]**



(a) q_2

(b) Only the positive charges

(c) All the charges

(d) $+q_1$ and $-q_1$

6. For a given surface the Gauss's law is stated as $\oint \boldsymbol{E}\cdot\boldsymbol{ds}=0$. From this we can conclude that **[MP PMT 1995]**

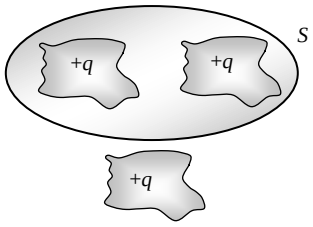
(a) E is necessarily zero on the surface

(b) E is perpendicular to the surface at every point

(c) The total flux through the surface is zero

(d) The flux is only going out of the surface

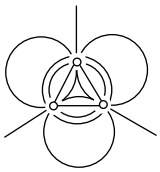
7. Shown below is a distribution of charges. The flux of electric field due to these charges through the surface *S* is

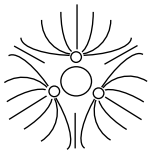


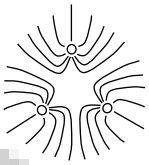
(a) $3q/\varepsilon_0$ (b) $2q/\varepsilon_0$

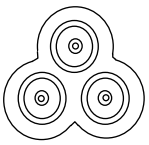
(c) q/ε_0 (d) Zero

8. Three positive charges of equal value *q* are placed at the vertices of an equilateral triangle. The resulting lines of force should be sketched as in **[IIT-JEE (Screening) 2001]**

(a) 

(b) 

(c) 

(d) 

ANSWERS

1. c
2. b
3. d
4. b
5. c
6. c
7. b
8. c

Note - If you have any query/issue

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