

Electric Flux

Electric Flux Question 1:

A hollow spherical shell of radius 40 cm contains two point charges $3q$ and $-3q$ placed at points separated by 30 cm inside the shell. What is the flux of the electric field due to the charges through the surface of the shell?

(Where ϵ_0 is the permittivity of air)

1. Zero

2. $3q/\epsilon_0$

3. $6q/\epsilon_0$

4. qq^2/ϵ_0

Electric Flux Question 2:

The flux associated with each wall of a cube having a charge Q at its centre is

1. $\frac{Q}{\epsilon_0}$

2. $\frac{Q}{2\epsilon_0}$

3. $\frac{Q}{4\epsilon_0}$

4. $\frac{Q}{6\epsilon_0}$

Electric Flux Question 3:

Suppose a uniform electric field is given as $E = 6 \times 10^4 \hat{j} \text{ N/C}$ ($\hat{j}$ is the unit vector along y axis). Then the flux of this field through a square of 40 cm on a side whose plane is inclined at an angle 60° to the xz plane is:

1. $4880 \text{ N m}^2/\text{C}$

2. $480 \text{ N m}^2/\text{C}$

3. $4800 \text{ N m}^2/\text{C}$

4. $488 \text{ N m}^2/\text{C}$

Electric Flux Question 4:

A square sheet of 5.0 cm is placed in an electric field $E = (1.6 \times 10^4 \frac{\text{N}}{\text{C}}) \hat{i}$ such that the normal unit vector for the sheet is $[(\frac{\sqrt{3}}{2})\hat{i} + (\frac{1}{2})\hat{j}]$. The electric flux through the sheet is:

1. $40 \text{ N m}^2/\text{C}$

2. $34.6 \text{ N m}^2/\text{C}$

3. $20 \text{ N m}^2/\text{C}$

4. $17.3 \text{ N m}^2/\text{C}$

Electric Flux Question 5:

Suppose a uniform electric field is given as $E = 4 \times 10^4 \hat{j}$ N/C ($\hat{j}$ is unit vector along the y axis), then the flux of this field through a square of 20 cm on a side whose plane is parallel to the xz plane is:

1. $160 \text{ N m}^2/\text{C}$
2. $800 \text{ N m}^2/\text{C}$
3. $1600 \text{ N m}^2/\text{C}$
4. $80 \text{ N m}^2/\text{C}$

Electric Flux Question 6

What is the flux through a cube of side a, if a point charge of q is at one of its corners?

1. $\frac{q}{\epsilon_0}$
2. $\frac{q}{2\epsilon_0}$
3. $\frac{2q}{\epsilon_0}$
4. $\frac{q}{8\epsilon_0}$