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. $\dfrac{Q}{\epsilon_0}$

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

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

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

Sreekanth Ramachandran

Electric Flux Question 3:

Suppose a uniform electric field is given as $E = 6 \times 10^4 \, \hat{J}$ 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 N m²/C

2. 480 N m²/C

3. 4800 N m²/C

4. 488 N m²/C

Electric Flux Question 4:

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

1. 40 N m²/C

2. 34.6 N m²/C

3. 20 N m²/C

4. 17.3 N m²/C

Sreekanth Ramachandran

Electric Flux Question 5:

Suppose a uniform electric field is given as $E = 4 \times 10^4 \, \hat{\jmath}$ N/C ($\hat{\jmath}$ 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 N m^2/C

2. 800 N m^2/C

3. 1600 N m^2/C

4. 80 N m^2/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. $\dfrac{q}{\varepsilon_0}$

2. $\dfrac{q}{2\varepsilon_0}$

3. $\dfrac{2q}{\varepsilon_0}$

4. $\dfrac{q}{8\varepsilon_0}$

Sreekanth Ramachandran