

**Answer on Question #52672-Physics-Electrodynamics**

A charge  $q$  is placed at one corner of a cube. The electric flux through any of the three faces adjacent to the charge is zero. The flux through any one of the other three faces is

- a)  $q/3\epsilon_0$  b)  $q/6\epsilon_0$  c)  $q/12\epsilon_0$  d)  $q/24\epsilon_0$

**Solution**

The other three sides, by symmetry, have the same flux. We can compute it by imagining 7 other identical cubes, with the charge at one corner of each, so that the 8 cubes together form one big cube of side length  $2d$ . Then the flux through each side of this big cube is  $\Phi_E = \frac{q}{6\epsilon_0}$ . But clearly the flux through one of the non-adjacent sides of the original cube is just 1/4th of this, so

$$\Phi_E = \frac{1}{4} \frac{q}{6\epsilon_0} = \frac{q}{24\epsilon_0}.$$

**Answer: d)  $q/24\epsilon_0$ .**