

**Answer on Question #41186, Physics, Electromagnetism**

The electric flux from a cube of edge  $l$  is  $\phi$ . What will be its value if edge of cube is made  $2l$  and charge enclosed is halved-

A)  $4\phi$       B)  $2\phi$       C)  $\phi$       D)  $\phi/2$

**Solution**

According Gauss's law the net flux from a cube is

$$\phi = \frac{Q}{\epsilon_0},$$

where  $Q$  is a charge enclosed by a cube,  $\epsilon_0$  is the vacuum permittivity.

If edge of cube is made  $2l$  and charge enclosed is halved the net flux from a cube is

$$\phi_1 = \frac{\frac{Q}{2}}{\epsilon_0} = \frac{1}{2} \frac{Q}{\epsilon_0} = \frac{1}{2} \phi.$$

Notice that the edge length of the cube did not enter into the calculation.

**Answer: D)  $\frac{1}{2} \phi$ .**