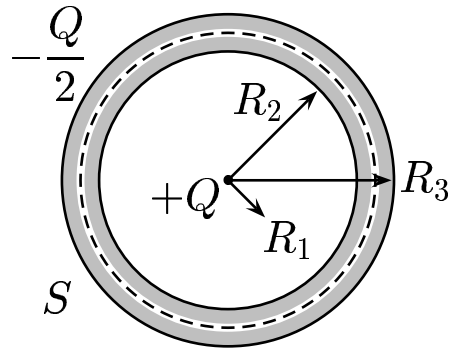


Consider an electrostatic situation. A point charge  $Q$  is located at the center of a thick spherical conducting shell. The net charge on the shell is  $-\frac{1}{2}Q$ . Let  $S$  (dashed circular line) be a concentric spherical surface (Gaussian surface) with a radius  $r$ .



Find the flux  $\Phi_S$  emanating through  $S$ , the Gaussian surface.

A)  $\Phi_S = \frac{Q}{\epsilon_0}$

B)  $\Phi_S = \frac{Q}{2\epsilon_0}$

C)  $\Phi_S = \frac{3Q}{2\epsilon_0}$

D)  $\Phi_S = 0$

E)  $\Phi_S = -\frac{Q}{\epsilon_0}$

For an electrostatic case, inside of a conductor or in a conducting

medium,  $\rho = 0$ . This implies that  $\Phi_S = \oint_S \vec{E} \cdot \vec{A} = 0$ .

Answer **D**.

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