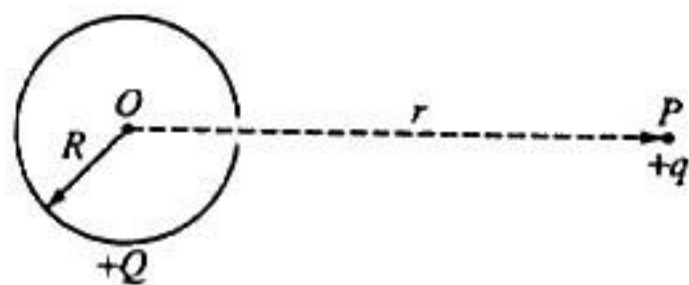


62. A positive electric charge is moved at a constant speed between two locations in an electric field, with no work done by or against the field at any time during the motion. This situation can occur only if the

- (A) charge is moved in the direction of the field
- (B) charge is moved opposite to the direction of the field
- (C) charge is moved perpendicular to an equipotential line
- (D) charge is moved along an equipotential line
- (E) electric field is uniform



63. The nonconducting hollow sphere of radius R shown above carries a large charge $+Q$, which is uniformly distributed on its surface. There is a small hole in the sphere. A small charge $+q$ is initially located at point P , a distance r from the center of the sphere. If $k = 1/4\pi\epsilon_0$, what is the work that must be done by an external agent in moving the charge $+q$ from P through the hole to the center O of the sphere?

- (A) Zero
- (B) $\frac{kqQ}{r}$
- (C) $\frac{kqQ}{R}$
- (D) $\frac{kq(Q - q)}{r}$
- (E) $kqQ\left(\frac{1}{R} - \frac{1}{r}\right)$