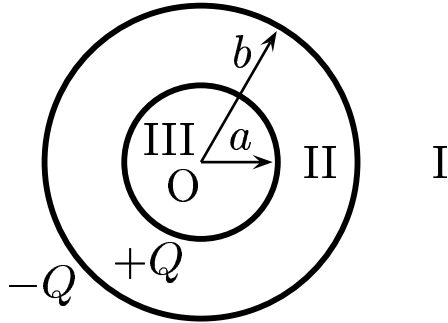


Given: Two thin concentric conducting spherical shells with charge Q on the inner shell (with radius a) and charge $-Q$ on the outer shell (with radius b).



Find $\Delta V_{ab} = V_b - V_a$.

A) $\Delta V = k \frac{Q}{b-a}$

B) $\Delta V = k \frac{Q}{b} - k \frac{Q}{a}$

C) $\Delta V = k \frac{Q}{a} + k \frac{Q}{b}$

D) $\Delta V = k \frac{Q}{a} - k \frac{Q}{b}$

E) $\Delta V = 0$

In region II,

$$\begin{aligned} \Delta V_{ab} = V_b - V_a &= - \int_{\infty}^b \vec{E} \cdot \vec{s} ds + \int_{\infty}^a \vec{E} \cdot \vec{s} ds = - \int_a^b \vec{E} \cdot \vec{s} ds \\ &= - \frac{kQ}{r} \Big|_a^b = k \frac{Q}{a} - k \frac{Q}{b}. \end{aligned}$$

Answer **D**.