Given two conducting spheres \( A \) and \( B \). There are positive charges on \( B \); i.e., \( Q_B > 0 \). The set up is in static equilibrium.

What is the sign of the net charge on \( A \)?

A) negative  
B) positive  
C) neutral  
D) negative or neutral  
E) positive or neutral
Coulomb’s law is $\vec{F}_{AB} = k \frac{Q_A Q_B}{r^2} \hat{r}_{AB}$, which tells us that unlike charges attract. Consequently, if $Q_B > 0$ then $Q_A < 0$; i.e., negative.

However if the net charge on sphere $B$ is neutral, the influence of the positive charge on sphere $A$ will polarize sphere $B$, such that the right-hand side of sphere $A$ will become negative and the left-hand side of sphere $A$ will become positive. This will produce an attractive force between sphere $A$ and sphere $B$.

The answer is “negative or neutral”.

Answer D.

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