A parallel plate system has a plate charge $Q$.

Within the gap $E_{\text{gap}} = \frac{\sigma_{\text{plate}}}{\varepsilon_0} = \frac{Q}{\varepsilon_0 A}$.

Determine electric force $F$ with which the bottom plate pulls the top plate.

A) $F = Q \, E_{\text{gap}}$

B) $F = \frac{1}{2} \, Q \, E_{\text{gap}}$

The electric field due to the bottom plate as shown is

$E_1 = \frac{Q_{\text{encl}}}{2 \, \varepsilon_0 \, A} = \frac{E_{\text{gap}}}{2}$. This leads to $F = Q \, E_1 = \frac{Q \, E_{\text{gap}}}{2}$

Answer B.