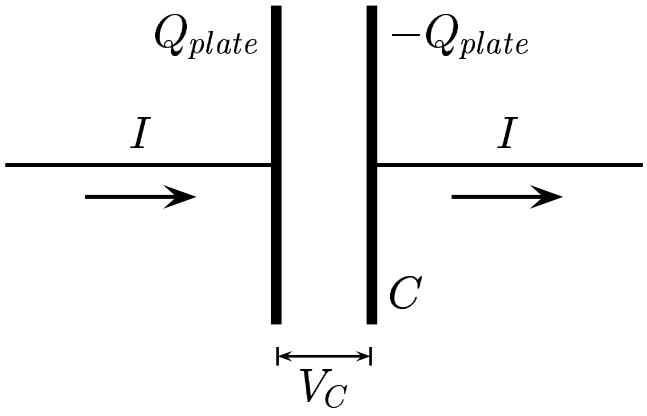
Consider the set up shown in the sketch.



Which of the following quantities is numerically equal to I ?

A) $I = \dfrac{d\,Q_{\text{plate}}}{dt}$.

B) $I = C\,\dfrac{d\,V_c}{dt}$.

C) $I = \epsilon_0\,\dfrac{d\phi_E}{dt}$.

D) All of the above

$Q_{\text{plate}} = C\,V_C$. For a parallel plate system, $E = \dfrac{Q_{\text{plate}}}{\epsilon_0\,A}$, so $Q_{\text{plate}} = \epsilon_0\,A\,E$.

The displacement current is equal to I.

Answer **D**.

30.08-01˙Displacement˙Current 2004-10-19