A small positively charged pendulum will be made to oscillate in a uniform electric field inside a large parallel plate capacitor as shown in the figure. Its time period as compared to that when it was uncharged:

(A) Will increase

(C) Will not change

(B) Will decrease(D) Will first increase then decrease

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Solution

We have,
$$T = 2\pi \sqrt{\frac{l}{g_{Effective}}}$$

The electric field inside the capacitor is upwards due to which the electric force on the positively charged pendulum is also upwards.

This upward electric force opposes the downward gravitational force, thereby decreasing $g_{Effective}$. So, T will increase.

Option (A)