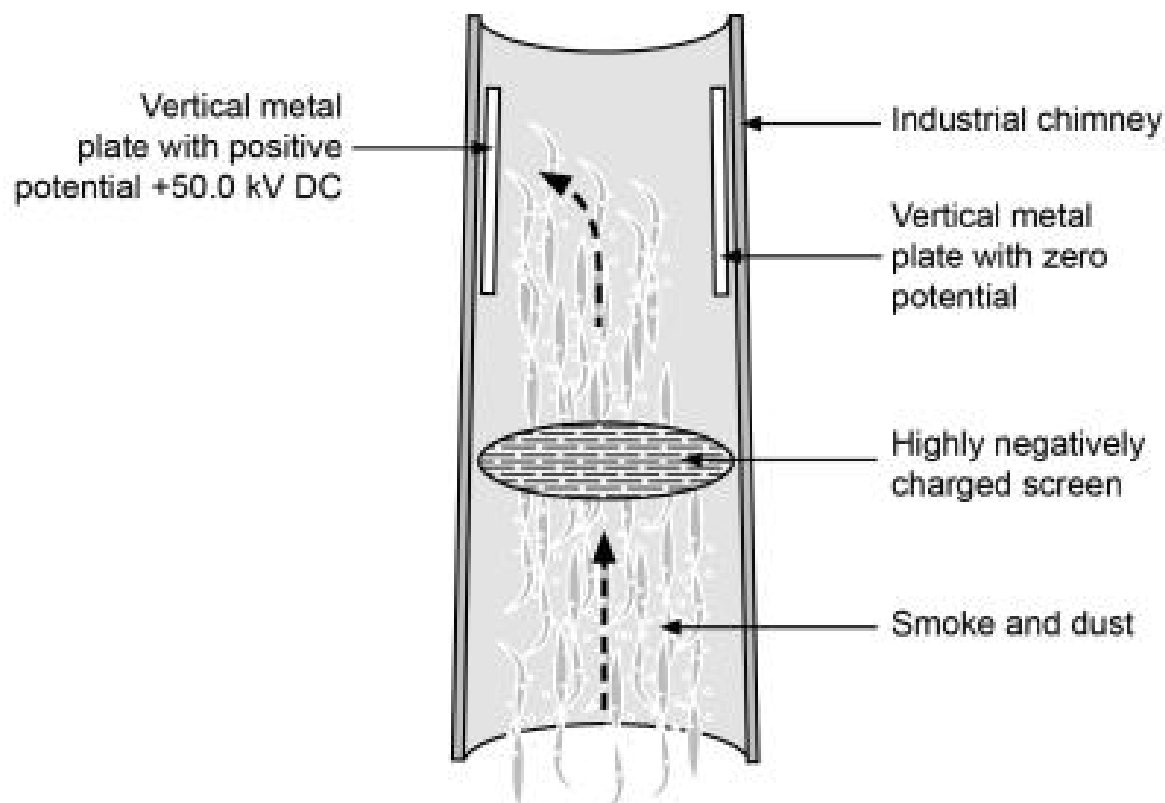


Question 5**(3 marks)**

Electrostatic precipitators are used inside industrial chimneys to remove smoke and dust particles from waste gases before being released into the atmosphere. As shown in the diagram below, smoke and dust particles pass through a highly negatively charged screen where the dust particles gain electrons and are charged to $-1.00 \times 10^{-8} \text{ C}$. They then flow upwards between two parallel vertical metal plates. One vertical metal plate has a positive potential of $+50.0 \text{ kV DC}$ and the other is earthed at zero volts.



Calculate the force exerted on one of these dust particles by the field when it is between the parallel vertical metal plates. The horizontal distance between the plates is 47.5 cm .