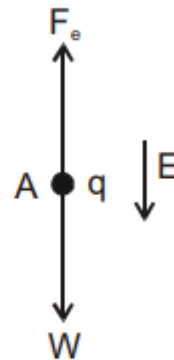Problem 3) Calculate the electric field intensity which would be just sufficient to balance the weight of a particle of charge $-10\mu c$ and mass 10 mg. (Take g = 10 ms^2)

Solution:-

As force on a charge q in an electric field $\vec{E}$ is $\vec{F}_q = q\vec{E}$

So, according to given problem:

[W = weight of particle]

$|\vec{F}_q| = |\vec{W}|$ i.e., $|q|E = mg$

i.e., $E = \dfrac{mg}{|q|}$ = 10 N/C., in downward direction.