6 **(a)** Define *electric field strength*.

....

....

.... [2]

(b) Two plane parallel conducting plates 1.50 cm apart are held horizontal, one above the other, in air. The upper plate is maintained at a positive potential of 1500 V while the lower plate is earthed, as shown in Fig. 6.1.
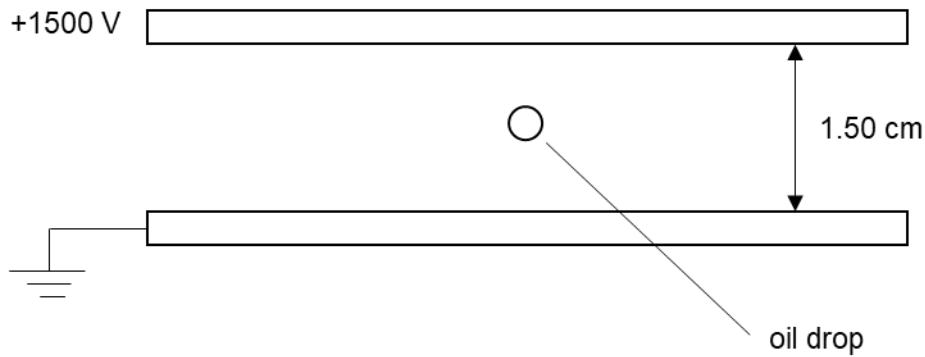

Fig. 6.1

(i) Calculate the number of electrons which must be attached to a small oil drop of mass of 4.90×10^{-12} g stationary in the air between the plates. Assume that the density of air is negligible in comparison with that of oil.

number of electrons = ... [3]

(ii) The potential of the upper plate is suddenly changed to −1500 V.

Determine the initial magnitude and direction of acceleration of the charged drop. Explain your answer.

magnitude of acceleration = ... m s^{-2}

direction of acceleration = ...

....

....

.... [3]