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

.....

.....[1]

(b) Two horizontal metal plates are 20 mm apart in a vacuum. A potential difference of 1.5 kV is applied across the plates, as shown in Fig. 4.1.

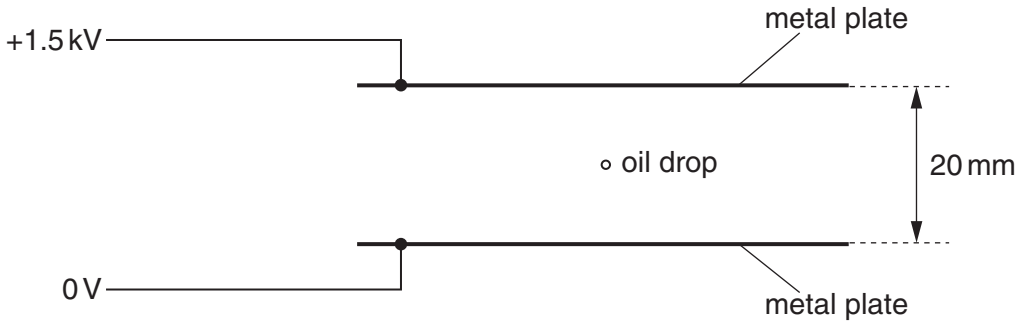

Fig. 4.1

A charged oil drop of mass 5.0×10^{-15} kg is held stationary by the electric field.

(i) On Fig. 4.1, draw lines to represent the electric field between the plates. [2]

(ii) Calculate the electric field strength between the plates.

electric field strength = ... $V\,m^{-1}$ [1]

(iii) Calculate the charge on the drop.

charge = ... C [4]

(iv) The potential of the upper plate is increased. Describe and explain the subsequent motion of the drop.

.....

.....

.....[2]