

- 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.

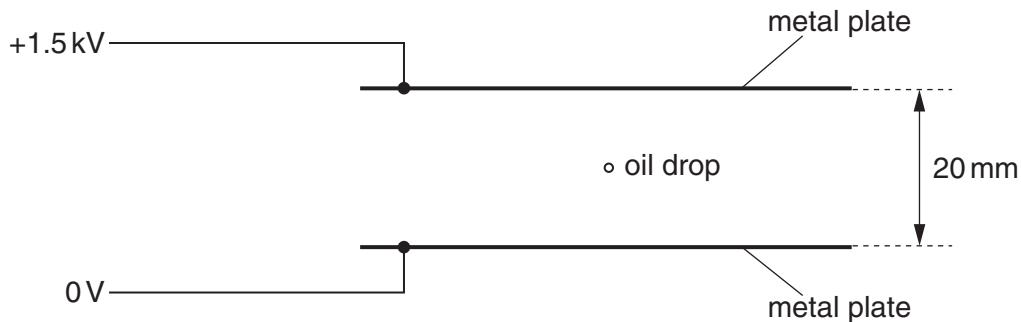


Fig. 4.1

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.

$$\text{electric field strength} = \dots \text{Vm}^{-1} [1]$$

- (iii) Calculate the charge on the drop.

$$\text{charge} = \dots \text{C} [4]$$

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

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..... [2]