5 Two large flat metal plates A and B are placed 9.0 cm apart in a vacuum, as illustrated in Fig. 5.1.

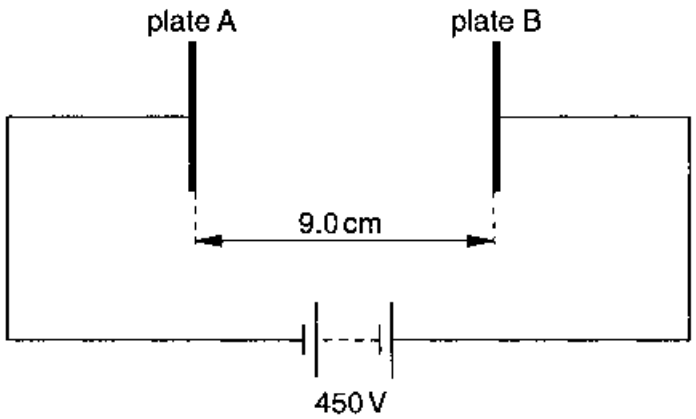

Fig. 5.1

A potential difference of 450 V is maintained between the plates by means of a battery.

(a) (i) On Fig. 5.1, draw an arrow to indicate the direction of the electric field between plates A and B.

(ii) Calculate the electric field strength between A and B.

field strength = ... $N C^{-1}$
[3]

For Examiner's Use

(b) An electron is released from rest at the surface of plate A.

(i) Show that the change in electric potential energy in moving from plate A to plate B is 7.2×10^{-17} J.

(ii) Determine the speed of the electron on reaching plate B.

speed = ... $m\,s^{-1}$
[4]

(c) On the axes of Fig. 5.2, sketch a graph to show the variation with distance d from plate A of the speed v of the electron. [1]

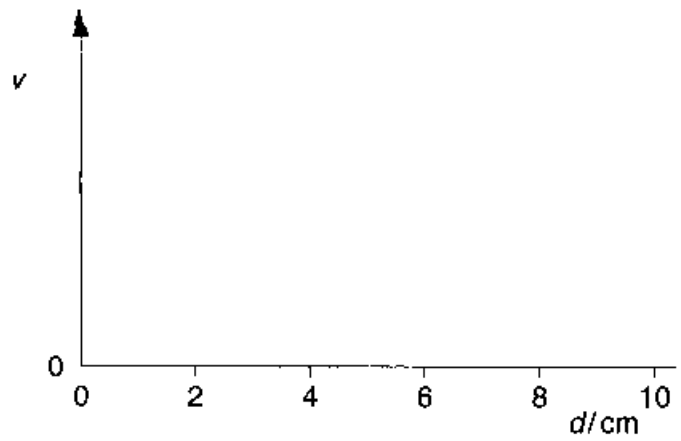

Fig. 5.2

[Turn over