7 The photoelectric effect may be represented by the equation

photon energy = work function energy + maximum kinetic energy of electron.

For Examiner's Use

(a) State what is meant by *work function energy*.

.....

.....[1]

(b) The variation with frequency f of the maximum kinetic energy E_K of photoelectrons emitted from the surface of sodium metal is shown in Fig. 7.1.

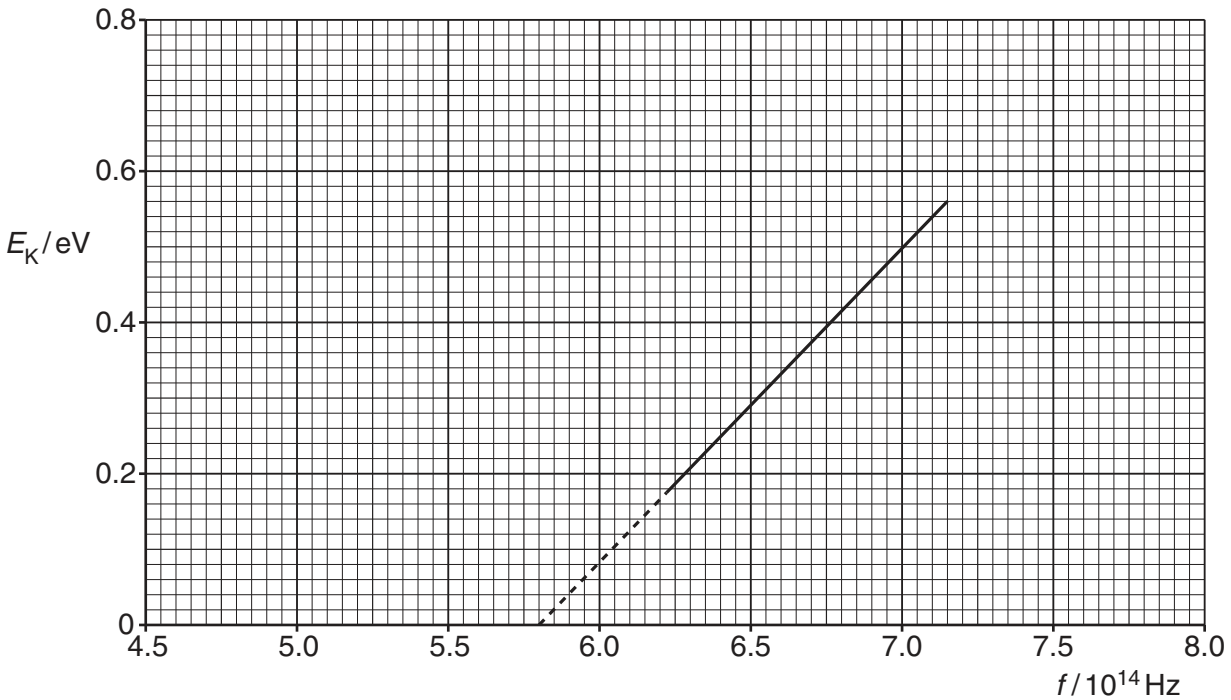

Fig. 7.1

Use the gradient of the graph of Fig. 7.1 to determine a value for the Planck constant h. Show your working.

h = ...J s [2]

(c) The sodium metal in **(b)** has a work function energy of 2.4 eV. The sodium is replaced by calcium which has a work function energy of 2.9 eV.

For Examiner's Use

On Fig. 7.1, draw a line to show the variation with frequency f of the maximum kinetic energy E_K of photoelectrons emitted from the surface of calcium. [3]