10 **(a)** By reference to the photoelectric effect, explain what is meant by *work function energy*.

.....

.....

..... [2]

(b) In an experiment, electromagnetic radiation of frequency f is incident on a metal surface.

The results in Fig. 10.1 show the variation with frequency f of the maximum kinetic energy E_{MAX} of electrons emitted from the surface.

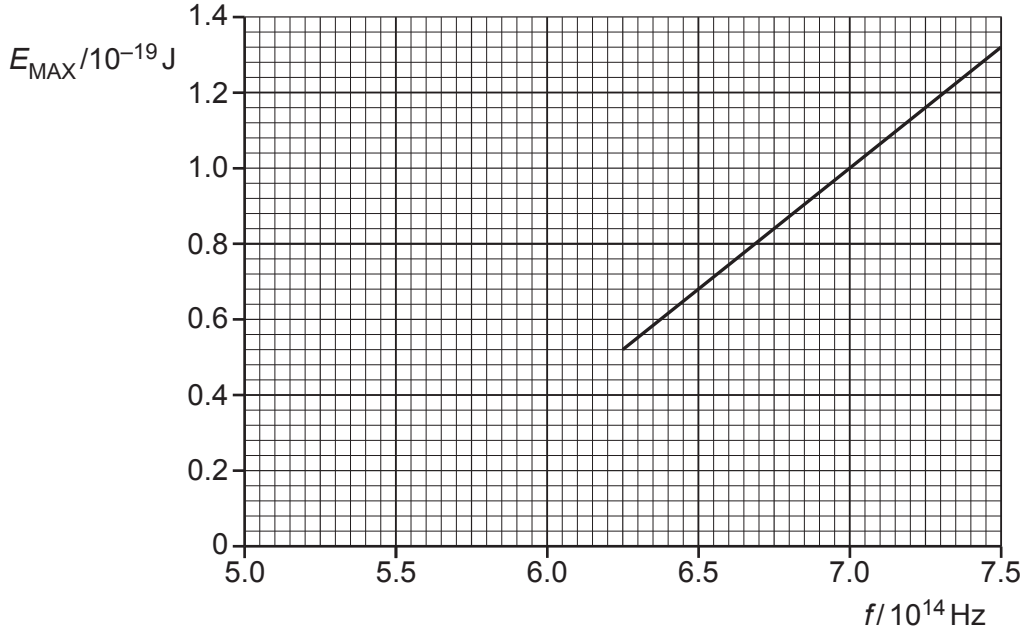

Fig. 10.1

(i) Determine the work function energy in J of the metal used in the experiment.

work function energy = ... J [2]

(ii) The work function energy in eV for some metals is given in Table 10.1.

Table 10.1

metal	work function / eV
tungsten	4.49
magnesium	3.68
potassium	2.26

Determine the metal used in the experiment. Show your working.

.....

..... [1]

(c) The intensity of the electromagnetic radiation for one particular frequency in **(b)** is increased.

State and explain the change, if any, in:

(i) the maximum kinetic energy of the emitted electrons

.....

..... [1]

(ii) the rate of emission of photoelectrons.

.....

..... [1]

[Total: 7]