8 **(a)** State what is meant by a photon.

.....

.....

..... [2]

(b) When the surface of a metal plate is illuminated with electromagnetic radiation, electrons are sometimes emitted from the metal.

(i) State the name of this phenomenon.

..... [1]

(ii) It is observed that this phenomenon occurs only when the frequency of the electromagnetic radiation is greater than a certain minimum value, regardless of the intensity of the radiation.

Explain how this observation provides evidence for the existence of photons.

.....

.....

.....

.....

..... [3]

(c) Fig. 8.1 shows the variation of the maximum kinetic energy of the emitted electrons in **(b)** with the frequency of the incident radiation.

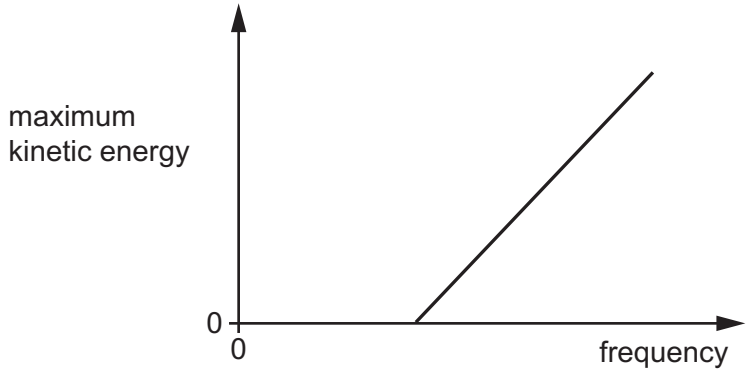

Fig. 8.1

State the name of the quantity represented by:

(i) the gradient of the line in Fig. 8.1

..... [1]

(ii) the *y*-intercept of the extrapolated line in Fig. 8.1.

..... [1]

[Total: 2]