

**12** Study of the photoelectric effect leads to observations that cannot be explained by the wave theory of light.

When ultraviolet light is shone on a charged zinc plate, electrons are released.

When visible light is shone on the zinc plate, electrons are not released.

(a) (i) State what is meant by threshold frequency.

(1)

(ii) Explain why the observation of a threshold frequency is **not** consistent with the wave theory of light.

(2)

(b) The photoelectric effect can be explained using the idea of photons.

State what is meant by the term photon.

(1)

**(Total for Question 12 = 4 marks)**