

AS Level Physics A
H156/01 Breadth in Physics

Question Set 22

1 (a) State **one** piece of evidence for the wave-like behaviour of electrons.

(b) (i) In an electron-gun, each electron is accelerated to a maximum kinetic energy of 210 eV. [1]

Show that the final speed of each electron is about $9 \times 10^6 \text{ ms}^{-1}$.

(ii) Calculate the de Broglie wavelength λ of each electron. [3]

$\lambda =$ m

(c) Electromagnetic waves interact with matter as photons. [2]

Explain the photoelectric effect using ideas of **photons**, **conservation of energy** and **work function**.

[4]

Total Marks for Question Set 22: 10

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