

- (d) (i) The energy of a photon of light is directly proportional to its frequency, with the constant of proportionality being called the Planck constant, h , i.e.

$$E = hf.$$

Using the above expression suggest suitable units for h .

[1]

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- (ii) It can be further shown that

$$V_{\min} = \frac{hc}{e\lambda},$$

where $c = 3.0 \times 10^8 \text{ ms}^{-1}$ and $e = 1.6 \times 10^{-19} \text{ C}$.

Use the data you obtained in (b) to calculate an average value for h .

[4]

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- (iii) Using the expression given on page 2 of the exam paper, calculate the percentage uncertainty in your result. [2]

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