

A level Physics B

H557/01 Fundamentals of physics

Question Set 23

1

A student performs Young's double slit experiment as shown in **Fig. 1.1**.

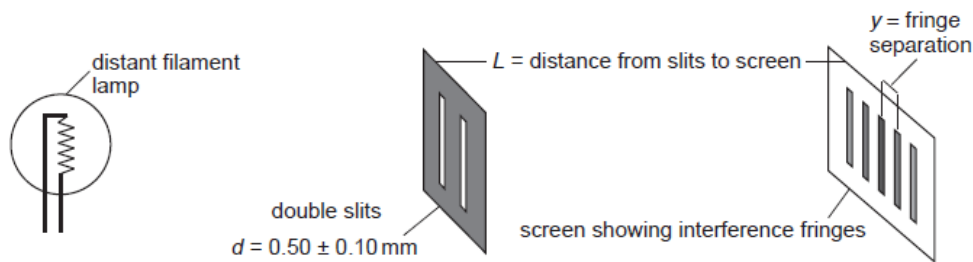


Fig. 1.1

The student investigates how the fringe spacing y varies with the distance L from slits to screen.

The student measures the slit separation $d = 0.5 \pm 0.1 \text{ mm}$.

Fig. 1.2 shows the data obtained with uncertainties.

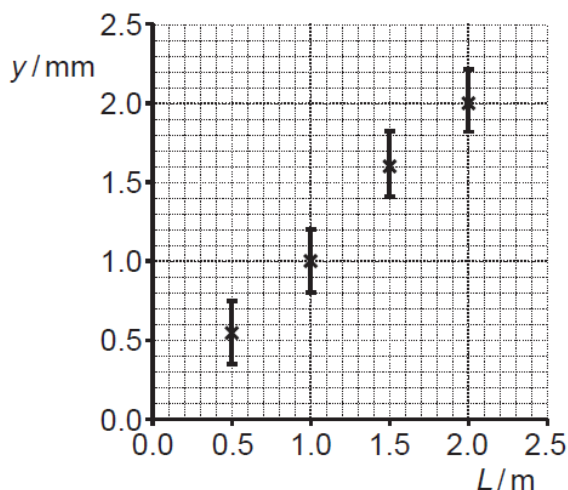


Fig. 1.2

(a) Suggest a reason why only uncertainties in the fringe spacing are shown on the graph.

[1]

(b) Draw a line of best fit on the graph and measure its gradient with an uncertainty estimate.

gradient = ±

[3]

(c) Use the gradient to estimate an average wavelength for the light together with an uncertainty estimate. Make your method clear.

wavelength = ±m

[3]

- (d) State **one** way in which you could refine or develop this practical design or procedure to reduce uncertainty.

[1]

Total Marks for Question Set: 8

OCR

Oxford Cambridge and RSA

Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge