GET BETTER AT PHYSICS · MARK SCHEME

Interference & Young's Double Slit: tiered multiple choice

AQA A-level Physics · 7407 / 7408 · Specification 3.3.2.1 · 6 questions · 6 marks

1 mark per correct letter | Worked reasoning for every question | **How students did** = from AQA examiner reports, where available

Answer key

Q1	Q2	Q3	Q4	Q5	Q6
D	A	D	D	A	C

Easy

Questions 1–3

1 **D**

What increases the fringe spacing? · AQA June 2018 · A-level Paper 1 · Q16

$w = \lambda D / s$. Decreasing the separation s of the double slits increases w.

Watch out: Moving the double slits closer to the screen (C) reduces D, which reduces w.

How students did: 74.9% of students got this right in June 2018.

2 **A**

Another arrangement with the same fringe spacing · AQA June 2019 · AS Paper 2 · Q18

$w = \lambda D / s$. Row A: $(2\lambda \times 2D) \div 4s = \lambda D / s$, the same as before.

Watch out: Check each row by working out the factor $(\lambda \times D) \div s$.

How students did: About 70% of students got this right in June 2019.

3 **D**

Slit separation from ten fringes · AQA June 2022 · A-level Paper 1 · Q20

$w = 3.5 \text{ cm} \div 10 = 3.5 \times 10^{-3}$ m. $s = \lambda D / w = 5.2 \times 10^{-7} \times 1.5 \div 3.5 \times 10^{-3} = 2.2 \times 10^{-4}$ m.

Watch out: Divide the width of ten fringes by 10 to get one fringe spacing.

Medium

Questions 4–6

4 **D**

Moving one microwave source to the next maximum · AQA June 2024 · AS Paper 2 · Q15

At the start the path difference is zero (a maximum). The next maximum needs a path difference of one wavelength: $M_2D - M_1D = 0.050$ m. $\sqrt{(1.0^2 + x^2)} = 1.05$, so $x^2 = 1.1025 - 1 = 0.1025$ and $x = 0.32$ m = 32 cm.

Watch out: The path difference is $M_2D - M_1D$, not the distance M_1M_2 itself (A).

How students did: In June 2024 this was one of the less successful questions, and a wrong answer was the most popular choice.

5 **A**

Wavelength from two consecutive maxima · AQA June 2024 · A-level Paper 1 · Q16

At a maximum the path difference is a whole number of wavelengths. W and Y are consecutive maxima, so their path differences differ by exactly one wavelength: $\lambda = (S_1Y - S_2Y) - (S_1W - S_2W)$.

Watch out: Using a maximum and the next minimum (B, C) gives only half a wavelength.

6 **C**

What decreases the fringe separation? · AQA 2021 · AS Paper 2 · Q19

w = λD / s. Light of higher frequency has a shorter wavelength, so w decreases.

Watch out: A, B and D all increase the fringe separation.

End of mark scheme. Answers from AQA's published keys; explanations written for this pack. AQA material is © AQA. More free packs and 1-to-1 tuition: **www.getbetteratphysics.co.uk**

GET BETTER AT PHYSICS · WHAT NEXT?

Got some of these wrong?

Good. The questions you got wrong show you exactly what to work on next. The quickest way to fix them is to work through them with someone who marks these papers.

Book a free 15-minute call

Tell me which questions caught you out. We'll talk about what's going wrong and whether 1-to-1 or small-group tuition would help. There's no obligation.

Book your free call

calendly.com/getbetteratphysics/freechat

Scan to book

Current AQA examiner
I know what the mark schemes reward and where marks are lost.

Matched to your exam board
Sessions follow your specification and the topics you find hardest.

Pay per session
No block booking. 1-to-1 or small groups of up to 4.

More free packs

Tiered past-paper questions with full mark schemes, sorted by topic.
getbetteratphysics.co.uk/free-revision-packs

Masterclasses are coming

Want to hear first? Email **helpme@getbetteratphysics.co.uk** and I'll let you know when dates are announced.

Parents: I use these packs in my own tutoring sessions. Tuition options and prices:
getbetteratphysics.co.uk/tuitionpricing