GET BETTER AT PHYSICS · MARK SCHEME

Progressive Waves: tiered multiple choice

Edexcel IAL Physics · Unit 2 (WPH12) · Specification points 33–34, 37 · 5 questions · 5 marks

1 mark per correct letter | Worked reasoning for every question

How students did = from Pearson examiner reports, where available

Answer key

Q1	Q2	Q3	Q4	Q5
D	B	C	C	A

Easy

Questions 1–3

1 **D**

Frequency from an oscilloscope trace · Edexcel IAL January 2024 · Unit 2 · Q7

One complete wave on the trace spans 4 horizontal divisions, so the period T = 4 × 0.015 s. Frequency f = 1/T = 1/(4 × 0.015) Hz.

Watch out: Count a full cycle (peak to next peak), not half a cycle.

How students did: 80% of students got this right in January 2024.

2 **B**

What a displacement–time graph can tell you · Edexcel IAL October 2023 · Unit 2 · Q5

A displacement–time graph for one point shows the period (and amplitude) directly. It cannot show the wavelength, which needs a displacement–distance graph or the wave speed. The graph could be for either a longitudinal or a transverse wave.

How students did: 54% of students got this right in October 2023.

3 **C**

Tension needed for the same wave speed · Edexcel IAL October 2023 · Unit 2 · Q8

$v = \sqrt{(T/\mu)}$, where μ is mass per unit length. The second string has the same mass but twice the length, so μ is halved. For the same v, T/μ must stay the same, so T must also be halved: T/2.

How students did: 50% of students got this right in October 2023.

Medium

Question 4

4 **C**

Wave speed on a longer string under more tension · Edexcel IAL June 2024 · Unit 2 · Q8

$v = \sqrt{(T/\mu)}$. The string is the same material and diameter, so its mass per unit length μ is unchanged (its length does not matter). The tension doubles, so v becomes $\sqrt{2} \times v$.

Watch out: Length is a distractor: μ is mass per unit length, which stays the same.

How students did: Examiners reported that fewer than half of students got this right in June 2024.

Hard

Question 5

5 **A**

Speed of waves on a string with hanging masses · Edexcel IAL October 2021 · Unit 2 · Q6

The tension is the weight of the hanging masses, T = Mg. The mass per unit length uses the whole string: it has length L + L/3 = 4L/3, so μ = m ÷ (4L/3) = 3m/(4L). Then v = √(T/μ) = √(4MgL/(3m)).

> **Watch out:** Use the whole length of the string for μ, not just the vibrating part.

How students did: In October 2021, about 23% of students got this right. Examiners said combining more than one idea made this less accessible.

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

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