GET BETTER AT PHYSICS · MARK SCHEME

Springs & Pendulums: tiered multiple choice

Edexcel IAL Physics · Unit 5 (WPH15) · Specification points 145, 149 · 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
A	D	B	C	D

Easy

Questions 1–5

1 **A**

Doubling the length of a pendulum · Edexcel IAL October 2023 · Unit 5 · Q10

$T = 2\pi\sqrt{(l/g)}$, so $f = 1/T \propto 1/\sqrt{l}$. Doubling the length multiplies the frequency by $1/\sqrt{2}$.

How students did: Examiners reported that at least 60% of students got this right in October 2023.

2 **D**

a–x graph for a simple pendulum · Edexcel IAL October 2024 · Unit 5 · Q4

For SHM, $a = -\omega^2 x$: a straight line through the origin with a negative gradient.

How students did: Examiners reported that at least 60% of students got this right in October 2024.

3 **B**

Doubling the mass on a spring · Edexcel IAL October 2024 · Unit 5 · Q6

$T = 2\pi\sqrt{(m/k)}$, so $T \propto \sqrt{m}$ and $f \propto 1/\sqrt{m}$. Doubling the mass multiplies f by $1/\sqrt{2}$: the new frequency is $f/\sqrt{2}$.

How students did: Examiners reported that at least 60% of students got this right in October 2024.

4 **C**

Ratio of periods for two masses on a spring · Edexcel IAL October 2025 · Unit 5 · Q9

$T = 2\pi\sqrt{(m/k)}$, so $T \propto \sqrt{m}$. $T_1/T_2 = \sqrt{(500/250)} = \sqrt{2}$.

5 **D**

Length of a long pendulum · Edexcel IAL January 2022 · Unit 5 · Q3

Swinging from one extreme to the other is half an oscillation, so the period $T = 2 \times 8.25 = 16.5$ s.

From $T = 2\pi\sqrt{(l/g)}$, $l = gT^2/(4\pi^2) = (16.5)^2 \times 9.81/(4\pi^2)$.

Watch out: One extreme to the other is only half a period.

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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