GET BETTER AT PHYSICS · MARK SCHEME

Hooke's Law & Springs: tiered multiple choice

Edexcel IAL Physics · Unit 1 (WPH11) · Specification points 27–29 · 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
B	D	A	C	D

Easy

Questions 1–5

1 **B**

Force needed to compress a stiffer spring · Edexcel IAL October 2019 · Unit 1 · Q10

Hooke's law: F = kΔx. Doubling the stiffness k for the same compression x doubles the force needed, so the force is 2F.

How students did: 80% of students got this right in October 2019.

2 **D**

Beyond the elastic limit · Edexcel IAL January 2025 · Unit 1 · Q4

Past the elastic limit, the spring is permanently (plastically) deformed: when the force is removed it does not return to its original length.

Watch out: Hooke's law only holds up to the limit of proportionality, so A is wrong.

3 **A**

Extension of a stiffer spring with a larger force · Edexcel IAL January 2025 · Unit 1 · Q6

Δx = F/k. For the second spring, Δx′ = 2F/(3k) = (2/3)(F/k) = (2/3)Δx.

4 **C**

Stiffness from a force–length graph · Edexcel IAL January 2024 · Unit 1 · Q7

Stiffness k = ΔF/Δx. The graph has force on the y-axis and length on the x-axis, and a change in length equals the extension, so the gradient of the sloping part gives k.

Watch out: Check the axes: if force were on the x-axis, you would need 1/gradient.

5 **D**

Stiffness from a length–force graph · Edexcel IAL June 2024 · Unit 1 · Q5

Stiffness k = force ÷ extension. The force rises from 0 to R while the length increases from p to q, so the extension is q − p and k = R/(q − p).

Watch out: Use the extension (q − p), not the final length q.

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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