GET BETTER AT PHYSICS · MARK SCHEME

Work & Energy: tiered multiple choice

Edexcel IAL Physics · Unit 1 (WPH11) · Specification points 17–20 · 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	C	D	B	C

Easy

Questions 1–5

1 **B**

Work done by a force at an angle · Edexcel IAL June 2023 · Unit 1 · Q2

Work done = force × distance moved in the direction of the force. The component of the 225 N force along the direction of travel is 225 cos 40°, so W = 225 × 450 × cos 40°.

2 **C**

What the gain in GPE equals · Edexcel IAL October 2023 · Unit 1 · Q5

The gain in gravitational potential energy equals the work done against the force of gravity. The helicopter also gains kinetic energy (its speed increases) and does work against air resistance, so the total work it does is more than the GPE gained.

> **Watch out:** Work done by gravity on the helicopter is negative here; it is work done against gravity that becomes GPE.

3 **D**

What the area under a graph represents · Edexcel IAL October 2019 · Unit 1 · Q4

Area under force–displacement and force–extension graphs is work done; power × time is energy transferred (work done). Area under a stress–strain graph has units N m^{-2}, which is energy per unit volume, not work.

How students did: 68% of students got this right in October 2019.

4 **B**

Energy changes as a spring pushes up a mass · Edexcel IAL January 2023 · Unit 1 · Q3

The elastic strain energy stored in the compressed spring, ½FΔx, is transferred to the object as kinetic energy ½mv^2 plus the gravitational potential energy it gains rising Δx, mgΔx. So ½FΔx = ½mv^2 + mgΔx.

5 **C**

Speed after sliding down a frictionless slope · Edexcel IAL June 2023 · Unit 1 · Q8

Height lost = 20 sin 23°. GPE lost = KE gained: mg(20 sin 23°) = ½mv^2, so v = √(2 × 9.81 × 20 × sin 23°).

> **Watch out:** The vertical height is the side opposite the 23° angle, so use sine.

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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