GET BETTER AT PHYSICS · MARK SCHEME

SUVAT & Free Fall: tiered multiple choice

Edexcel IAL Physics · Unit 1 (WPH11) · Specification points 1, 11 · 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
C	A	D	C	C

Easy

Questions 1–4

1 **C**

Effect of air resistance on a falling ball · Edexcel IAL January 2024 · Unit 1 · Q5

Air resistance reduces the resultant force, so the actual acceleration is less than g. The ball therefore takes longer to fall (t greater than calculated) and reaches a lower speed (v less than calculated).

2 **A**

Why a value of g came out too large · Edexcel IAL June 2024 · Unit 1 · Q8

$g = 2s/t^2$, so a value of g that is too large means the measured time was too short. If the ball is already moving downwards when the stopwatch starts, part of the fall is not timed, so t is too small. B, C and D would all make the measured time too long, giving a value of g that is too small.

3 **D**

Conditions for measuring g by free fall · Edexcel IAL January 2023 · Unit 1 · Q4

The method assumes the only force on the ball is its weight, so the acceleration is g. That is only true if air resistance and upthrust are negligible. Laminar flow and terminal velocity concern motion through a fluid, which this experiment must avoid.

4 **C**

Distance during uniform acceleration · Edexcel IAL January 2023 · Unit 1 · Q5

With uniform acceleration the average velocity is ½(u + v). Distance = average velocity × time = 0.5 × (35 + 50) × 5.

Hard

Question 5

5 **C**

Distances fallen in equal time intervals · Edexcel IAL October 2019 · Unit 1 · Q9

From rest, $s = \frac{1}{2}gt^2$, so after 1, 2, 3 intervals the distances fallen are in the ratio 1 : 4 : 9. Image 2 is 1 spacing below Image 1, so Image 3 is 4 spacings below Image 1. That is position R.

> **Watch out:** Doubling the time does not double the distance. In the second interval the average speed is three times that in the first, so the ball falls three times as far.

How students did: 18% of students got this right in October 2019. Most chose B, thinking the sphere falls twice as far because its speed doubles.

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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