GET BETTER AT PHYSICS · MARK SCHEME

# Motion Graphs: tiered multiple choice

Edexcel IAL Physics · Unit 1 (WPH11) · Specification points 2–3 · 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 | D | B | D | C |

## Easy

Questions 1–4

**1** **D**

Area under an acceleration–time graph · Edexcel IAL January 2025 · Unit 1 · Q5

The area under an acceleration–time (or deceleration–time) graph is the change in velocity. So the shaded area is the change in velocity of the aeroplane during time t (its decrease in speed).

> **Watch out:** Area under a velocity–time graph gives displacement; area under an acceleration–time graph gives change in velocity.

**2** **D**

Distance from a velocity–time graph · Edexcel IAL January 2025 · Unit 1 · Q8

Distance = area under the graph. From 0 to t: a trapezium, ½(2v + v)t = 1.5vt. From t to 2t: a rectangle, vt. Total = 2.5vt = 5vt/2.

**3** **B**

Displacement–time graph for constant acceleration · Edexcel IAL June 2025 · Unit 1 · Q6

With constant non-zero acceleration the velocity changes steadily, so the gradient of the displacement–time graph must change steadily. Only the curved (parabolic) graph B does this. The straight lines show constant velocity.

**4** **D**

Displacement–time graph from an acceleration–time graph · Edexcel IAL October 2025 · Unit 1 · Q9

Constant positive acceleration then zero acceleration means the velocity increases steadily, then stays constant. So the displacement–time graph must curve upwards (gradient increasing) and then become a straight sloping line. D does this: the object starts moving backwards, slows, turns and then moves forwards at constant velocity.

> **Watch out:** C levels off, which would mean the velocity drops to zero, but nothing slows the object once the acceleration stops.

# Hard

Question 5

**5** **C**

Acceleration of a rocket after the fuel runs out · Edexcel IAL June 2019 · Unit 1 · Q8

While the fuel burns, the constant thrust gives a constant upward acceleration. When the fuel runs out (before the top is reached) the only force is weight, so the acceleration becomes −g and stays constant. The change happens when the fuel runs out, not at time T when the rocket reaches its highest point.

> **Watch out:** The rocket keeps rising after the fuel runs out. Maximum height (time T) is where the velocity is zero, not where the acceleration changes.

**How students did:** 19% of students got this right in June 2019. The most common wrong answer was D: many placed the change in acceleration at the wrong time.

**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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