GET BETTER AT PHYSICS · MARK SCHEME

Scalars & Vectors: tiered multiple choice

Edexcel IAL Physics · Unit 1 (WPH11) · Specification points 4–6 · 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	D	B

Easy

Questions 1–4

1 **B**

Finding a component of velocity · Edexcel IAL October 2019 · Unit 1 · Q5

The velocity of 0.5 m s^{-1} along the escalator is the hypotenuse. Horizontal component = $\sqrt{(0.5^2 - 0.3^2)} = \sqrt{0.16} = 0.4$ m s^{-1}.

Watch out: Subtract the squares, not the speeds: 0.5 − 0.3 = 0.2 is a common slip.

How students did: 90% of students got this right in October 2019.

2 **C**

Acceleration and work done · Edexcel IAL January 2025 · Unit 1 · Q3

Acceleration has a direction, so it is a vector. Work done is energy transferred, which has no direction, so it is a scalar.

3 **D**

Units that can only belong to a scalar · Edexcel IAL June 2019 · Unit 1 · Q1

m s^{-1} could be speed or velocity, m s^{-2} is acceleration and kg m s^{-1} is momentum. kg m^{-3} is density, which has no direction, so it can only be a scalar.

How students did: 77% of students got this right in June 2019. The most common wrong answer was A.

4 **D**

Resultant of three forces · Edexcel IAL June 2025 · Unit 1 · Q7

The vertical forces are in opposite directions, so the vertical resultant is 15 000 − 14 500 = 500 N. This is at right angles to the 200 N force, so the resultant is $\sqrt{((15\,000 - 14\,500)^2 + 200^2)}$.

Watch out: Subtract the opposing forces first, then use Pythagoras. Don't square each force separately.

Medium

Question 5

5 **B**

Adding two displacements on bearings · Edexcel IAL June 2019 · Unit 1 · Q9

Draw the 12 km leg (bearing 135°, towards the south-east) then the 20 km leg from its end (bearing 340°, almost due north and slightly west). The resultant goes from the start to the finish: it points north and slightly west, and is shorter than 20 km. That matches B.

> **Watch out:** Draw the triangle carefully. A construction line that is too short reverses the direction of the resultant.

How students did: 39% of students got this right in June 2019. The most common wrong answer was A: a too-short construction line reversed the resultant.

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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