GET BETTER AT PHYSICS · MARK SCHEME

Circular Motion: tiered multiple choice

Edexcel IAL Physics · Unit 4 (WPH14) · Specification points 87–91 · 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	D	B	B	C

Easy

Questions 1–4

1 **C**

Turntable angular velocity · Edexcel IAL October 2020 · Unit 4 · Q9

33 revolutions per minute = 33/60 revolutions per second. Multiply by 2π radians per revolution: $\omega = (33/60) \times 2\pi$ rad s^{-1}.

How students did: 93% of students got this right in October 2020.

2 **D**

Converting rev/min to rad/s · Edexcel IAL January 2023 · Unit 4 · Q2

1500 revolutions per minute = 1500/60 revolutions per second. Each revolution is 2π radians, so $\omega = 1500 \times 2\pi/60$ rad s^{-1}.

How students did: 89% of students got this right in January 2023.

3 **B**

Angular velocity from revolutions · Edexcel IAL October 2023 · Unit 4 · Q8

12 revolutions = 12 × 2π radians, completed in 6 s. ω = angle ÷ time = $12 \times 2\pi/6$ rad s^{-1}.

How students did: 88% of students got this right in October 2023.

4 **B**

Moon's orbit: bigger radius, same period · Edexcel IAL January 2022 · Unit 4 · Q10

$\omega = 2\pi/T$, so if T stays constant the angular velocity stays constant. The speed $v = \omega r$, so with a larger radius the speed increases.

How students did: 71% of students got this right in January 2022.

Medium

Question 5

5 **C**

Force from a humpback bridge · Edexcel IAL October 2023 · Unit 4 · Q10

At the top of the bridge the resultant force must point down towards the centre of the circle and equal mv^2/r. Weight mg acts down and the bridge's reaction R acts up: $mg - R = mv^2/r$, so $R = mg - mv^2/r$.

Watch out: The reaction is less than mg at the top of a hump: that is why you feel lighter.

How students did: 38% of students got this right in October 2023.

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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