GET BETTER AT PHYSICS · MARK SCHEME

Intensity: tiered multiple choice

Edexcel IAL Physics · Unit 2 (WPH12) · Specification points 44 · 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	D	B	B	A

Easy

Questions 1–4

1 **B**

Definition of intensity · Edexcel IAL October 2024 · Unit 2 · Q1

Intensity is power per unit area: the power of light incident on a surface divided by the area of that surface, $I = P/A$, in W m^{-2}.

Watch out: It is power per unit area, not energy per unit area.

2 **D**

Efficiency of a solar panel · Edexcel IAL October 2019 · Unit 2 · Q7

Power arriving at the panel = intensity × area = 1050 × 1.54 W. Useful output = 250 W. Efficiency = useful output ÷ input = 250 ÷ (1050 × 1.54).

How students did: Examiners named this among the best-answered multiple-choice questions on the October 2019 paper.

3 **B**

Power of the Sun from intensity · Edexcel IAL June 2022 · Unit 2 · Q3

The Sun's power spreads over a sphere of radius d: $I = P/(4\pi d^2)$. So $P = I \times 4\pi d^2 = (1.45 \times 10^4)(4\pi)(4.60 \times 10^{10})^2$.

4 **B**

Intensity at twice the distance · Edexcel IAL January 2024 · Unit 2 · Q8

For a point source, $I = P/(4\pi d^2)$, so intensity $\propto 1/d^2$. Doubling the distance makes the intensity $1/2^2 = 1/4$ as large: I/4.

How students did: 54% of students got this right in January 2024.

Medium

Question 5

5 **A**

Intensity of sunlight at two distances · Edexcel IAL June 2023 · Unit 2 · Q9

$I = P/(4\pi r^2)$, so $I \propto 1/r^2$ and $I_E/I_J = r_J^2/r_E^2$. So $I_E = I_J \times (7.78 \times 10^{11})^2/(1.49 \times 10^{11})^2$. Earth is closer, so its intensity is larger, which this gives.

Watch out: The 4π cancels when you compare two intensities from the same source.

How students did: Examiners reported that fewer than half of students got this right in June 2023. Examiners called this an unusual twist on the intensity equation.

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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