GET BETTER AT PHYSICS · MARK SCHEME

Alpha, Beta & Gamma Radiation: tiered multiple choice

Edexcel IAL Physics · Unit 5 (WPH15) · Specification points 137–138, 140 · 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	A	B	C	B

Easy

Questions 1–4

1 **B**

Ionising power and penetration · Edexcel IAL January 2021 · Unit 5 · Q3

Alpha particles are highly ionising: they lose their energy quickly and travel only a few centimetres in air. Gamma radiation is weakly ionising, so it is very penetrating.

How students did: 89% of students got this right in January 2021.

2 **A**

Properties of alpha, beta and gamma · Edexcel IAL October 2024 · Unit 5 · Q1

Alpha radiation is the most ionising (and the least penetrating). Gamma is the most penetrating and the least ionising; beta is in between for both.

How students did: Examiners reported that at least 60% of students got this right in October 2024.

3 **B**

Ionising power and penetration of gamma · Edexcel IAL October 2023 · Unit 5 · Q8

Gamma radiation interacts weakly with matter, so it has low ionising power. Because it loses energy so slowly, it has high penetration.

How students did: Examiners reported that at least 60% of students got this right in October 2023.

4 **C**

Intensity after three half-thicknesses of lead · Edexcel IAL June 2025 · Unit 5 · Q7

2.5 cm of lead halves the corrected intensity. 7.5 cm is three times as thick, so the intensity is halved three times: $(½)^3 = 0.125 \approx 0.13\ I_0$.

Medium

Question 5

5 **B**

Inverse square law with background radiation · Edexcel IAL June 2025 · Unit 5 · Q6

First remove the background: the count rate due to the source is 54 − 22. Doubling the distance from 25 cm to 50 cm reduces this by a factor of $2^2 = 4$. The detector will still record the background, so add 22 back on: (54 − 22)/4 + 22.

Watch out: Only the source's contribution follows the inverse square law; the background stays the same.

How students did: Examiners reported that fewer than 60% of students got this right in June 2025.

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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