GET BETTER AT PHYSICS · MARK SCHEME

Radioactive Decay & Half-Life: tiered multiple choice

Edexcel IAL Physics · Unit 5 (WPH15) · Specification points 141–142 · 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	C	D	C

Easy

Questions 1–5

1 **D**

Why radioactive decay is random · Edexcel IAL October 2022 · Unit 5 · Q5

Each nucleus has a fixed probability of decaying in any given time interval, so we cannot predict when an individual nucleus will decay.

2 **D**

Meaning of 'random' in radioactive decay · Edexcel IAL June 2024 · Unit 5 · Q5

Random means we cannot predict when a particular nucleus will decay: each nucleus has a fixed probability of decaying in a given time. 'Spontaneous' is a different idea: decay is not affected by external factors.

3 **C**

Original activity after two half-lives · Edexcel IAL January 2022 · Unit 5 · Q4

25 years is 2 half-lives of tritium (12.5 years each). The activity halves twice, so the original activity was 22 × 2 × 2 = 88 Bq.

4 **D**

Number of daughter atoms over time · Edexcel IAL June 2022 · Unit 5 · Q9

The number of thallium atoms starts at zero and increases as the bismuth decays. It rises quickly at first and then levels off as the bismuth runs out: the graph rises and curves towards a maximum (D).

5 **C**

Activity from half-life and number of nuclei · Edexcel IAL October 2021 · Unit 5 · Q6

$A = \lambda N$, with $\lambda = \ln 2 / t_{½}$. So $A = (\ln 2 / 185) \times 2.75 \times 10^{15}$ Bq.

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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