

Radioactivity

Question Paper

Level	GCSE
Subject	Physics
Exam Board	Edexcel IGCSE
Module	Single Award (Paper 2P)
Topic	Radioactivity & Particles
Sub-Topic	Radioactivity
Booklet	Question Paper

Time Allowed: 28 minutes

Score: /23

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	70%	60%	55%	50%	<50%

1. The table shows the nature of alpha and beta particles.

Particle	Nature
alpha	helium nucleus
beta	electron

Explain why alpha particles and beta particles have different penetrating powers.

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(Total for Question 1 = 5 marks)

(c) The radioactive source contains strontium-90.

A strontium-90 nucleus emits a beta (β^-) particle.

(i) Complete the equation to show how strontium-90 decays.

(1)



(ii) Which of these describes what happens to the strontium-90 nucleus when it emits a beta (β^-) particle?

(1)

- A the number of protons stays the same
- B the number of protons increases
- C the number of neutrons stays the same
- D the number of neutrons increases

(Total for Question 2 = 7 marks)

3. Alpha and beta particles may be emitted by unstable nuclei.

(a) (i) When an unstable nucleus emits an alpha particle, its atomic (proton) number

(1)

- A** increases by 1
- B** stays the same
- C** decreases by 2
- D** decreases by 4

(ii) When an unstable nucleus emits an alpha particle, its mass (nucleon) number

(1)

- A** increases by 1
- B** stays the same
- C** decreases by 2
- D** decreases by 4

(b) Compared to a beta particle, an alpha particle

(1)

- A** causes less ionisation
- B** has less charge
- C** has less mass
- D** has less penetrating power

(c) Describe how a teacher should measure the activity of a radioactive source using a Geiger-Muller detector.

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(Total for Question 3 = 7 marks)

4. These questions are about radioactivity.

(a) Which of these is measured in becquerel (Bq)?

(1)

- A** activity
- B** frequency
- C** half-life
- D** radiation

(b) Which of these has a mass (nucleon) number of 4?

(1)

- A** alpha particle
- B** beta particle
- C** gamma ray
- D** x-ray

(c) Which of these is the same as an electron?

(1)

- A** alpha particle
- B** beta particle
- C** gamma ray
- D** x-ray

(d) Which of these is the most ionising?

(1)

- A** alpha particle
- B** beta particle
- C** gamma ray
- D** x-ray

(Total for Question 4 = 4 marks)

5. Iodine-131 is a radioactive isotope that emits beta particles.

(a) The equation for this decay is



(i) The atomic (proton) number for iodine-131 is

(1)

- A 0
- B 53
- C 78
- D 131

(ii) The mass (nucleon) number for Xe is

(1)

- A -1
- B 0
- C 53
- D 131

(b) Iodine-131 is used to treat thyroid cancer.

This radioactive isotope is allowed to enter the tumour.

Explain why iodine-131 is suitable for this treatment.

(2)

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(Total for Question 5 = 4 marks)