

PRACTICE QUIZ

PHYSICS[®]
ONLINE

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Radioactivity - Alpha, Beta & Gamma

* Required

Email *

What is your first & last name?

Q1

A powder contains 400 mg of a radioactive material that emits α -particles.

The half-life of the material is 5 days.

What mass of that material remains after 10 days?

- A** 0 mg **B** 40 mg **C** 100 mg **D** 200 mg

Q1 Answer

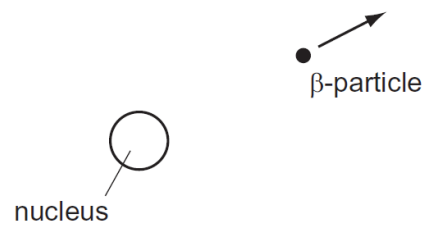
10 points

Mark only one oval.

- A
- B
- C
- D

Q2

A radioactive nucleus emits a β -particle.



What happens to the proton number (atomic number) of the nucleus?

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

Q2 Answer

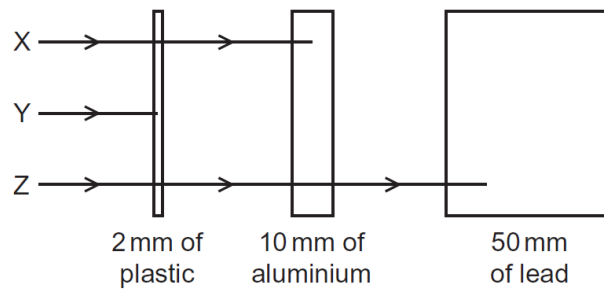
10 points

Mark only one oval.

- A
- B
- C
- D

Q3

The diagram shows the paths of three different types of radiation, X, Y and Z.



Which row in the table correctly identifies X, Y and Z?

	X	Y	Z
A	α -particles	β -particles	γ -rays
B	β -particles	α -particles	γ -rays
C	β -particles	γ -rays	α -particles
D	γ -rays	α -particles	β -particles

Q3 Answer

10 points

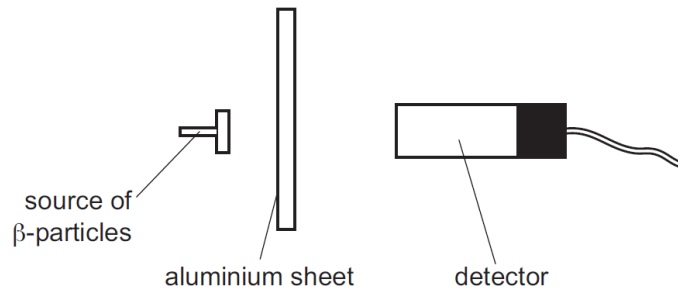
Mark only one oval.

- A
- B
- C
- D

Q4

A radiation detector is placed close to a source of β -particles.

Aluminium sheets of increasing thickness are placed between the source and the detector.



Eventually a sheet which is 2.0 cm thick is used. The reading on the detector decreases, but does not fall to zero.

Why does the reading not fall to zero?

- A Some of the β -particles go round the edges of the sheet.
- B The detector is too close to the source.
- C There is always some background radiation.
- D The sheet can never be thick enough to absorb all the β -particles.

Q4 Answer

10 points

Mark only one oval.

- A
- B
- C
- D

Q5

Why are some radioactive sources stored in boxes made from lead?

- A Lead absorbs emissions from the radioactive sources.
- B Lead decreases the half-life of radioactive sources.
- C Lead increases the half-life of radioactive sources.
- D Lead repels emissions from the radioactive sources.

Q5 Answer

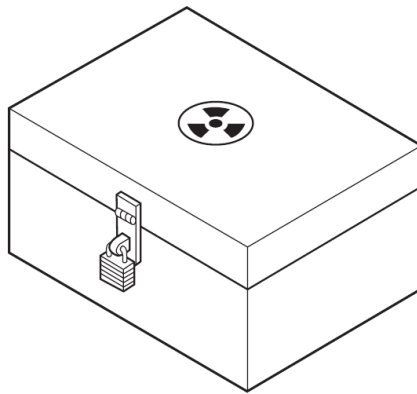
10 points

Mark only one oval.

- A
- B
- C
- D

Q6

The diagram shows a box used for storing radioactive sources.



Which material is best for lining the box to prevent the escape of most radioactive emissions?

- A** aluminium
- B** copper
- C** lead
- D** steel

Q6 Answer

10 points

Mark only one oval.

- A
- B
- C
- D

Q7

The nucleus of an americium atom contains 146 neutrons and 95 protons. It decays by emitting an α -particle.

How many neutrons and how many protons remain in the nucleus when this form of americium decays?

	number of neutrons remaining	number of protons remaining
A	142	93
B	142	95
C	144	93
D	144	95

Q7 Answers

10 points

Mark only one oval.

A

B

C

D

Q8

α , β and γ -radiations are emitted by radioactive substances.

Which statement is correct?

- A** α -radiation consists of charged particles and is the most highly ionising radiation.
- B** β -radiation consists of charged particles and is the most penetrating radiation.
- C** β -radiation consists of uncharged particles and is the least highly ionising radiation.
- D** γ -radiation consists of uncharged particles and is the least penetrating radiation.

Mark only one oval.

A

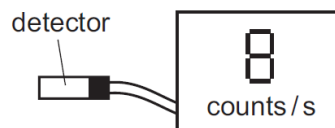
B

C

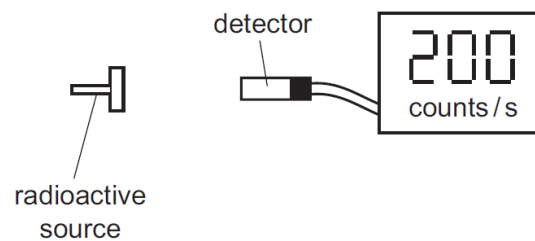
D

Q9

In a laboratory, a detector of ionising radiation records an average background count rate of 8 counts per second.



A radioactive source is now placed close to the detector. The count rate on the detector rises to 200 counts per second.



What is the count rate due to radiation from the radioactive source?

- A 25 counts/s
- B 192 counts/s
- C 200 counts/s
- D 208 counts/s

Q9 Answers

10 points

Mark only one oval.

 A B C D

Q10

Which row gives the properties of the radiation from radioactive materials?

	most penetrating radiation	most highly ionising radiation
A	α	β
B	β	γ
C	γ	α
D	γ	γ

Q10 Answers

10 points

Mark only one oval.

 A B C D