OCR
Oxford Cambridge and RSA

GCSE Physics B (Twenty First Century Science)

J259/01 Breadth in Physics (Foundation Tier)

Question Set 8

Multiple Choice Questions

1 Some smoke alarms contain the radioactive isotope americium-241.

(a) Americium-241 can be represented as

$$^{241}_{95}Am$$

(i) Which is the number of protons in americium-241?

Put a ring around the correct answer.

95 **241** **241 + 95** **241 – 95**

[1]

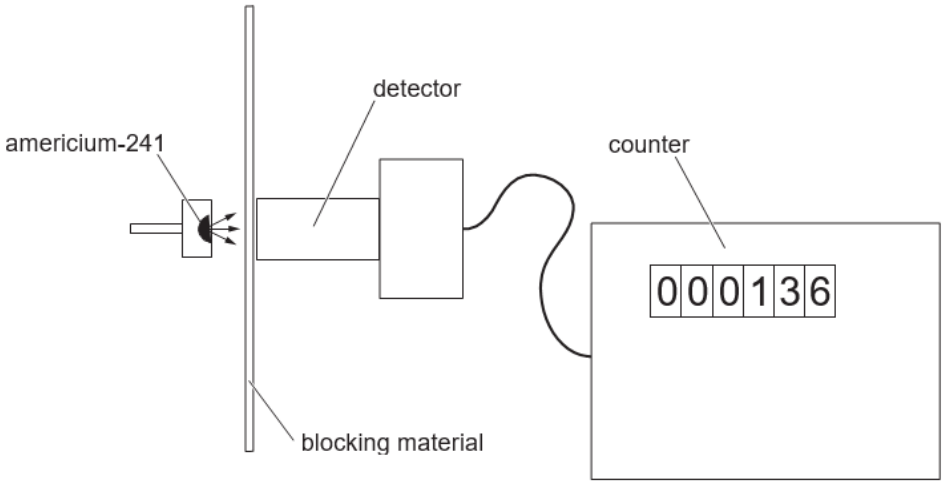
(ii) Which is the number of neutrons in americium-241?

Put a ring around the correct answer.

95 **241** **241 + 95** **241 – 95**

[1]

(b) Two students investigate the radiation emitted by americium-241.
The diagram shows their equipment.



They recorded the number of counts detected in one minute with different blocking materials. The table shows their results.

Blocking material	Counts per minute
nothing (just air)	620
paper	23
thin aluminium	23

(i) The students agree that americium-241 emits alpha radiation but not beta radiation.

Explain how the evidence supports this conclusion.

[2]

(ii) They cannot tell from their results whether americium-241 emits gamma radiation.

What should they do to decide whether the source emits gamma radiation?

[2]

(c) In fact, americium-241 emits both alpha radiation **and** gamma radiation.

Evaluate how dangerous it is to have a small amount of americium-241 in a smoke alarm.

[2]

Total Marks for Question Set 8: 8