Radioactivity

Question Paper

Course	CIE IGCSE Physics
Section	5. Nuclear Physics
Topic	Radioactivity
Difficulty	Hard

Time Allowed 10

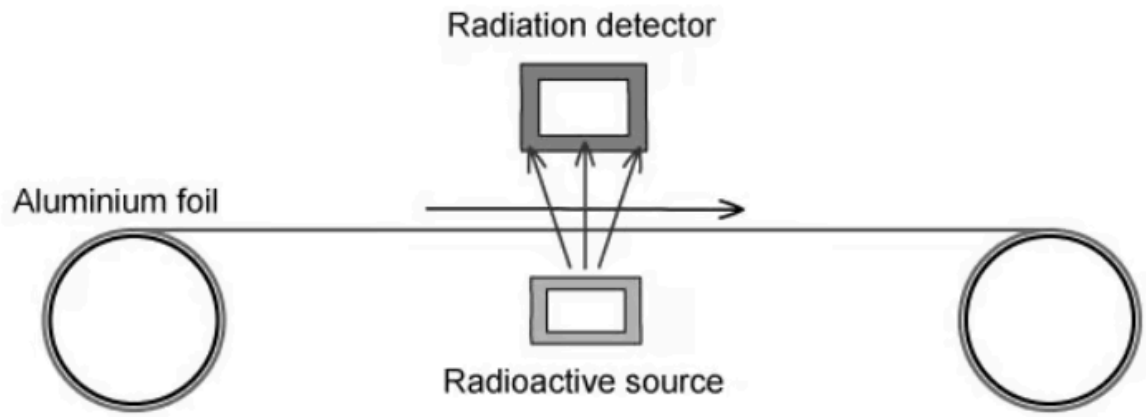
Score /5

Percentage /100

Question 1

Extended tier only

Radioactive sources are often used in industry as part of manufacturing processes. The diagram below shows radiation being used to measure the thickness of a sheet of aluminium foil. The detector feeds back to the rollers to adjust the thickness.



What type of radiation would be the most suitable for this purpose?

A. **α**-particles

B. **β**-particles

C. **γ**-rays

D. All of the above

[1 mark]

Question 2

The count rate of a radioactive material is measured using a detector. The reading on the detector is 88 counts per second. The background count rate is 40 counts per second.

The half-life of the radioactive substance is 12 hours. What is the reading on the detector after 24 hours?

A. 22

B. 12

C. 44

D. 52

[1 mark]

Question 3

A radioactive substance has a half-life of 4 days.

It is currently emitting 8000 **β**-particles per minute.

How many **β**-particles will it emit per minute after 12 days?

A. 4000

B. 2000

C. 1000

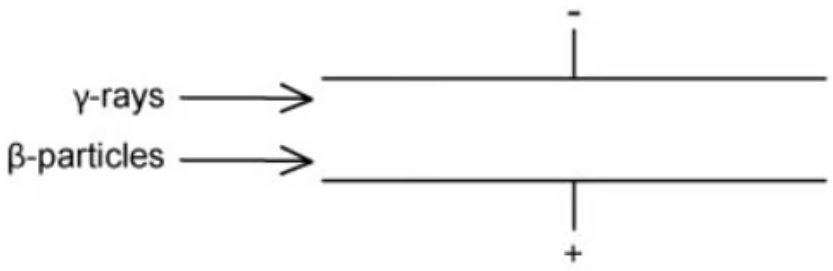
D. 667

[1 mark]

Question 4

Extended tier only

Beta and gamma radiation are passed through two charged metal plates as shown in the diagram below.



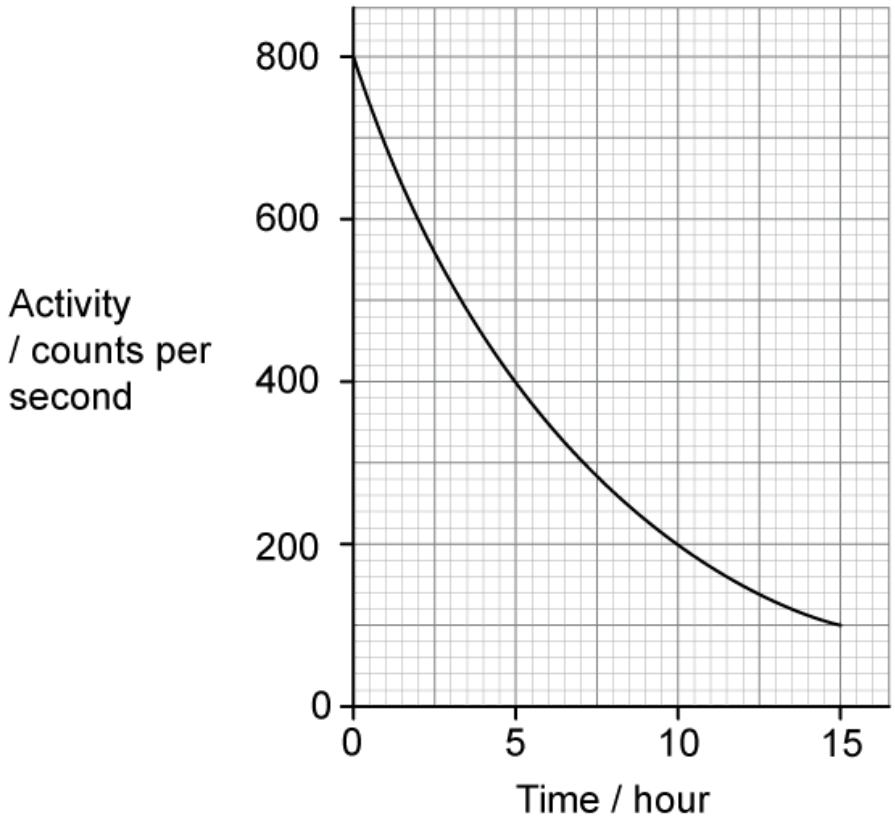
Which direction, if any, would the **β**-particles and **γ**-rays be deflected?

	β-particles	**γ-rays**
A	into the page	continue straight
B	towards the negative plate	out of the page
C	continue straight	towards the negative plate
D	towards the positive plate	continue straight

[1 mark]

Question 5

The graph shows the activity of a radioactive source over a period of time.



What is the half-life of the source?

A. 5 seconds

B. 5 minutes

C. 300 seconds

D. 300 minutes

[1 mark]