

Radioactivity

Question Paper

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

Time Allowed 10

Score /5

Percentage /100

Question 1

A student carried out an experiment to find the half-life of a radioactive substance. Their results are shown in the table below.

Time(seconds)	Count-rate from source(counts per second)
0	300
20	200
40	150
60	100
80	75

What is the half-life of this substance?

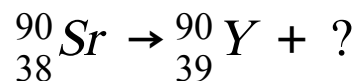
- A.** 20 seconds
- B.** 40 seconds
- C.** 60 seconds
- D.** 80 seconds

[1 mark]

Question 2**Extended tier only**

Strontium-90 is a radioactive substance with the nuclide symbol ${}^{90}_{38}\text{Sr}$.

It decays by emitting radiation, as shown by the following equation.



What is missing in this equation?

- A. α -particle
- B. Neutron
- C. γ -ray
- D. β -particle

[1 mark]

Question 3**Extended tier only**

A radioactive nucleus emits a β -particle.

What happens to the proton number and the nucleon number of this nucleus?

	Proton number	Nucleon number
A	increases by 1	stays the same
B	stays the same	decreases by one
C	decreases by 2	decreases by 4
D	decreases by 1	stays the same

[1 mark]**Question 4**

The count rate from a radioactive isotope is recorded every hour. The count rate is corrected for background radiation. The table shows the readings.

time / hours	0	1	2	3	4	5
corrected count rate / counts/s	1200	990	816	673	555	458

What estimate of the half-life of the isotope can be obtained from the readings in the table?

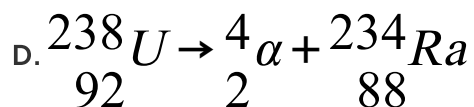
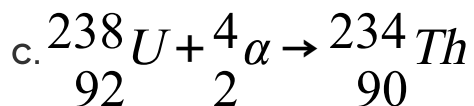
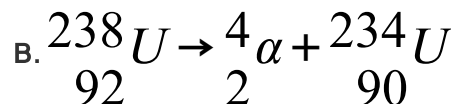
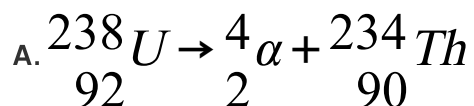
- A.** between 1 and 2 hours
- B.** between 2 and 3 hours
- C.** between 3 and 4 hours
- D.** between 4 and 5 hours

[1 mark]

Question 5**Extended tier only**

A nucleus of uranium (${}_{92}^{238}\text{U}$) is unstable and decays by emitting an α -particle.

Which equation correctly describes this process?



[1 mark]