

Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Q1.

A simple spark counter can be used to detect charged particles. It is made by having two wires close together with a large voltage across them. When a charged particle passes through the gap between the wires a spark is seen.

(a) Give the names and symbols of **two** particles which will cause a spark.

(i) Name _____ Symbol _____

(ii) Name _____ Symbol _____

(4)

(b) A radioactive source was placed within 2 cm of the spark counter and lots of sparks were seen. A piece of paper was slid between the source and the counter. The sparking stopped.

(i) What type of radiation was being given off?

(1)

(ii) The paper was removed and the source slowly moved away from the spark counter. Describe what will happen to the sparking.

(2)

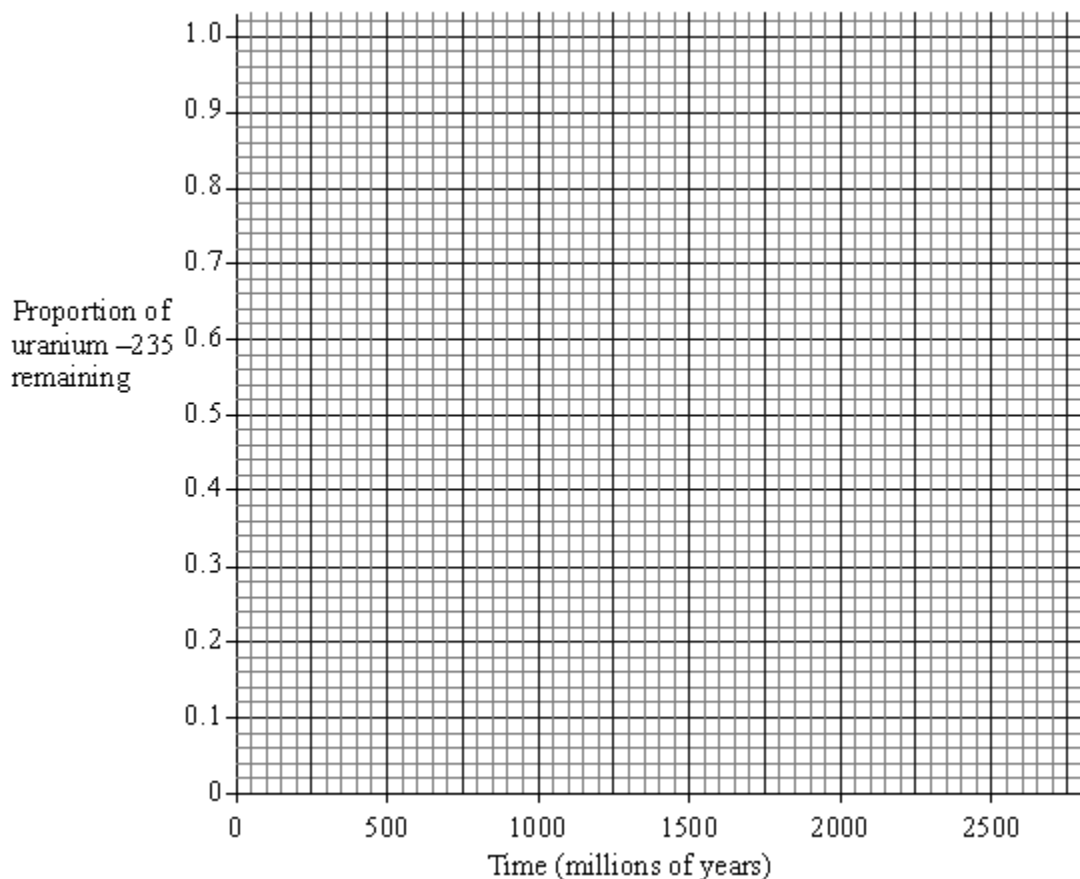
(c) A radioactive source gave a high reading using a Geiger-Müller tube and counter, but did not cause sparking when brought near to the spark counter. Why?

(1)**(Total 8 marks)****Q2.**

Some rocks contain the radioactive isotope uranium-235 (^{235}U).

^{235}U has a half-life of 700 million years and, as it decays, lead-207 (^{207}Pb) is eventually formed.

- (a) Draw a decay curve for ^{235}U on the graph below.



(4)

- (b) Samples of an igneous rock gave an average ratio of 70 atoms of ^{235}U to 30 atoms of ^{207}Pb .
Use the decay curve you have drawn to estimate the age of the igneous rock.

Answer _____ million years.

(1)

- (c) A sandstone rock which lies above the igneous rock contains traces of uranium-235 and of lead-207.

Why might it be unsatisfactory to use this uranium for dating the sandstone?

(2)

(Total 7 marks)

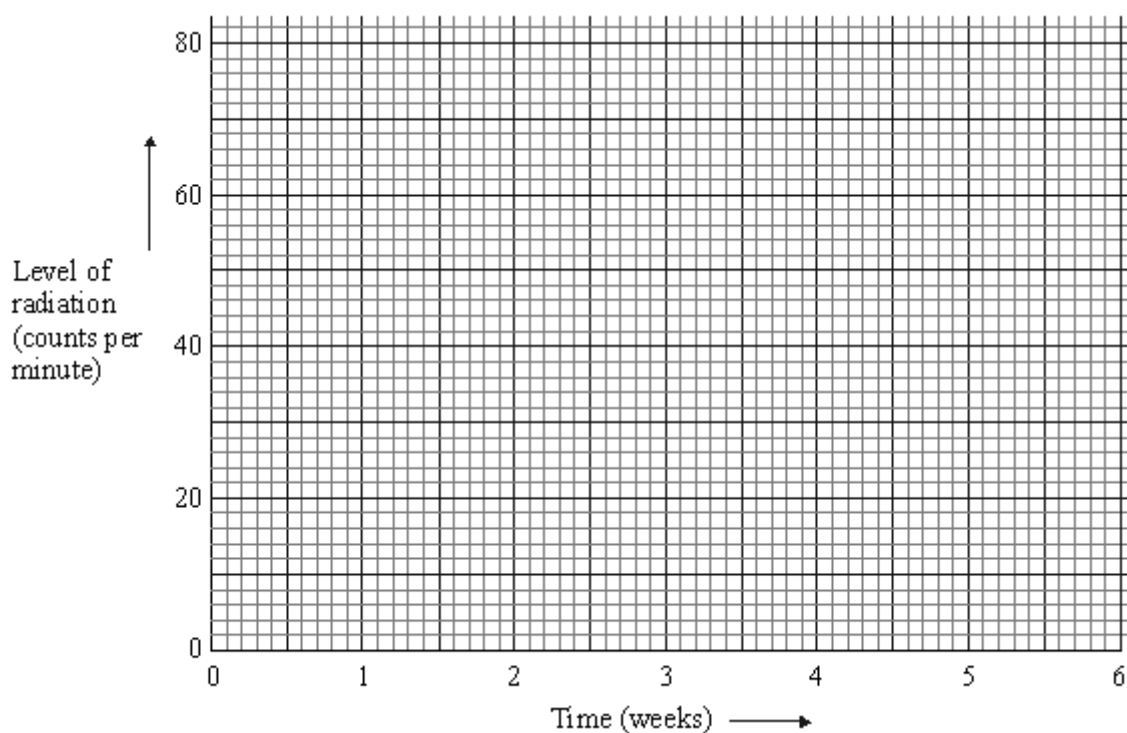
Q3.

Some students measure the level of radiation from a radioactive source during the same lesson each week over a period of six weeks.

Here are the results. (They have been corrected for background radiation.)

Time (weeks)	start	1	2	3	4	5	6
Level of radiation (average counts per minute)	66	44	34	29	16	12	8

- (a) Using the graph paper below, display these results in the most appropriate way.



(5)

- (b) What overall pattern is there in the students' results?

(3)

(Total 8 marks)