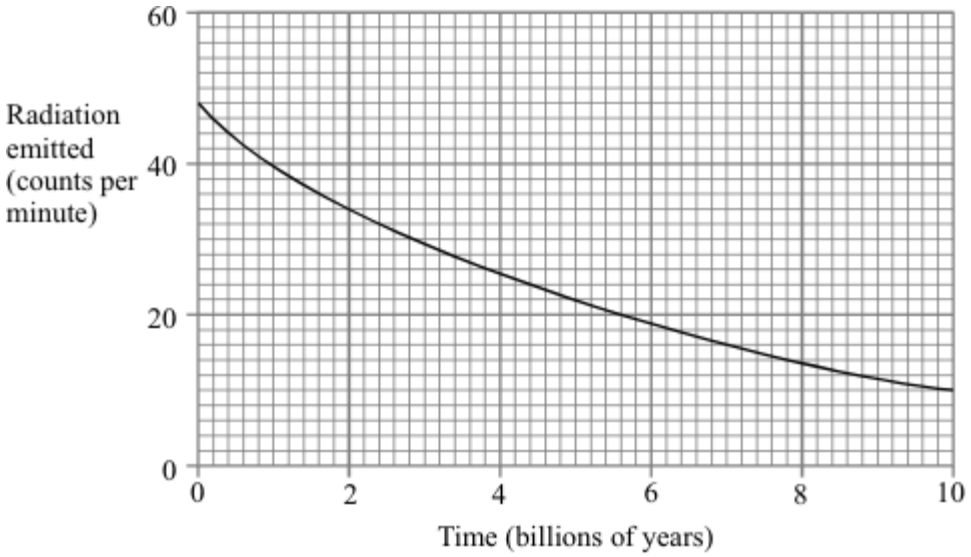
Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic: Atomic Structure (High Demand)

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Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Q1.

The graph shows how the amount of radiation emitted by a sample of the radionuclide uranium 238 (U^{238}) changes as time passes.



(a) What is the half-life of uranium 238 (U^{238})?
(You should show how you obtained your answer. You may do this on the graph if you wish.)

_____

_____

Answer _____

(3)

(b) What fraction (or percentage) of the uranium 238 (U^{238}) atoms will have decayed after 9 billion years?

_____

(1)

(c) Uranium 238 (U^{238}) decays through a long series of intermediate radionuclides to stable atoms of the isotope lead 206 (Pb).

A sample of igneous rock contains 3 atoms of uranium 238 (U^{238}) for every atom of lead 206 (Pb^{206}).

(i) The intermediate radionuclides are not important when estimating the age of the rock. Explain why.

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_____

_____

(1)

(ii) Estimate the age of the rock.
(You should explain how you obtained your answer.)

_____

_____

_____

Answer _____ billion years

(3)

(Total 8 marks)

Q2.

When atoms of uranium 238 (U^{234}) decay they produce another radionuclide called thorium 234 (Th^{234})

Thorium 234 (Th^{234}) decays by emitting beta radiation.

(i) What does beta radiation consist of?

_____

(1)

(ii) Thorium 234 (Th^{238}) decays to form protactinium 234 (Pa^{234}).

What differences are there between the nucleus of a protactinium 234 (Pa^{234}) atom and the nucleus of a thorium 234 (Th^{234}) atom?

_____

_____

(2)

(Total 3 marks)

Q3.

A gold medal was made for a competition.

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By Fighting Irish 1977 (Flickr: 2012 Olympics Gold Medal) [CC-BY-2.0], via Wikimedia Commons

(a) The mass number of gold is 197.

Describe the structure of a gold atom.

Use the Chemistry Data Sheet to help you answer this question.

_____

_____

_____

_____

_____

_____

_____

_____

(4)

(b) Bronze medals are made from an alloy of copper.

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Copper can be extracted by phytomining.

(i) Why is phytomining being used to extract copper?

_____

_____

(1)

(ii) Give the main steps involved in the phytomining process.

_____

_____

_____

_____

_____

_____

(3)
(Total 8 marks)

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