Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : 6_ Radioactivity

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Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

Some rocks contained uranium when they were formed.

Radioactive decay in these rocks produces radon gas.

Explain why people living near these rocks have an increased health risk from background radiation.

(3)

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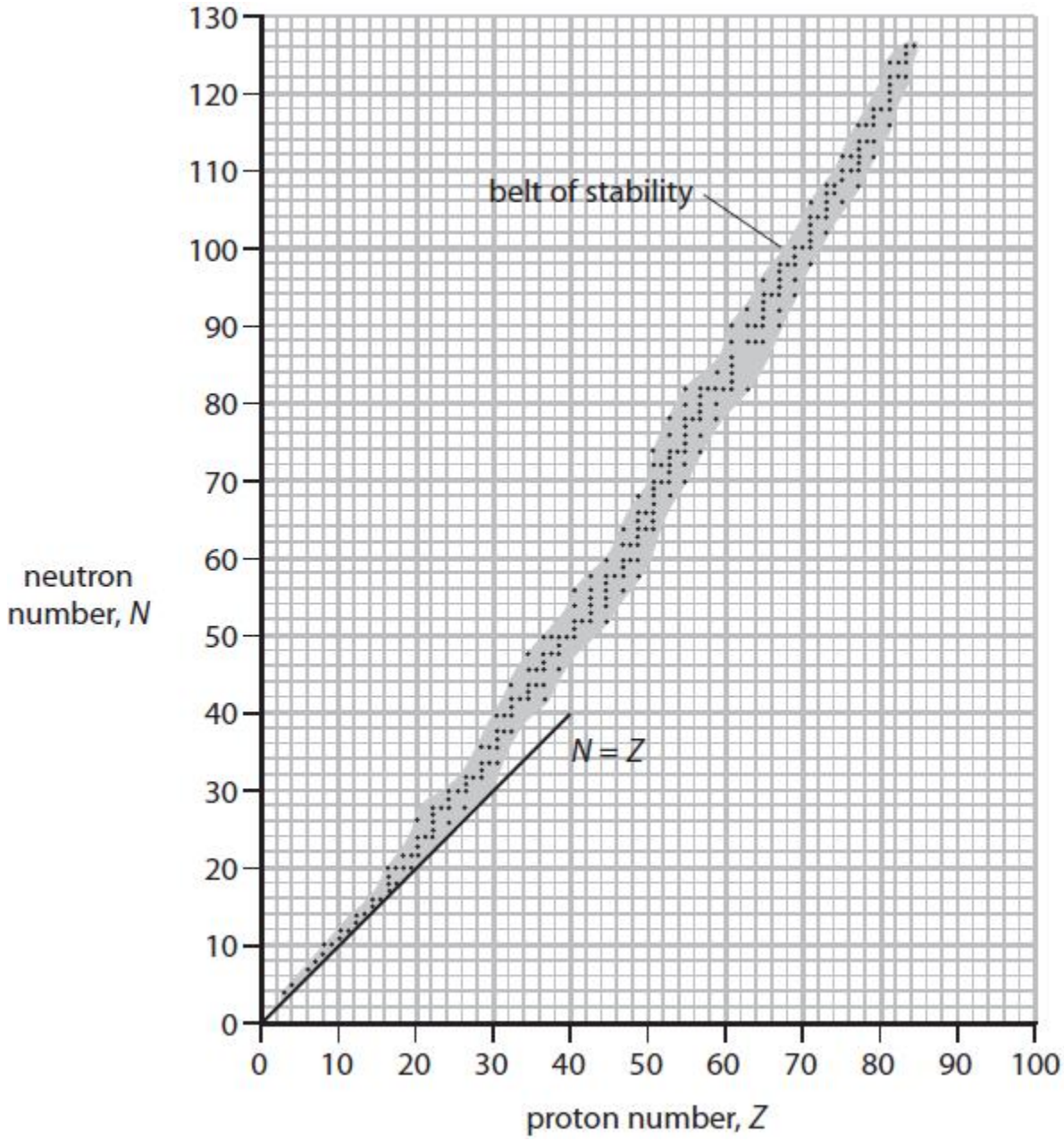
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Q2.

(a) The diagram shows the stability curve for nuclear isotopes.

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Complete the sentence by putting a cross (☒) in the box next to your answer.
An isotope above the curve will undergo β^- decay because it has

(1)

- ☐ **A** too few protons
- ☐ **B** too many protons
- ☐ **C** too few neutrons
- ☐ **D** too many neutrons

(b) Which statement is correct for β^+ and β^- particles?

Put a cross (☒) in the box next to your answer.

(1)

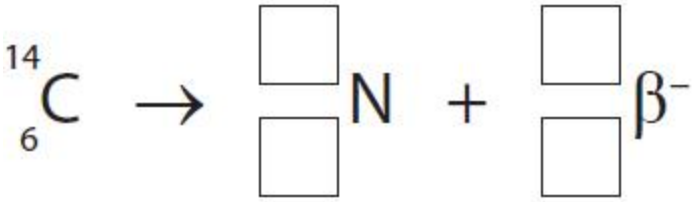
- ☐ **A** a β^+ is positively charged and a β^- is negatively charged
- ☐ **B** the mass of a β^+ is 1800 times the mass of a β^-
- ☐ **C** the charge on a β^+ is twice the charge on a β^-
- ☐ **D** a β^+ is a proton and a β^- is an electron

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(c) Carbon-14 decays by emitting a β^- particle to form an isotope of nitrogen.

Complete the nuclear equation for this decay by filling in the boxes.

(2)



(d) Protons and neutrons both contain quarks.

Describe the arrangement of quarks in a proton.

(2)

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(e) Explain what happens to a nucleus during β^+ decay.

(2)

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Q3.

A G-M tube is connected to a counter.
A teacher places the G-M tube near to a radioactive source.
A student starts the counter and clock at the same time and writes down the readings shown on the counter every 15 s.

The student plots the readings with a line of best fit, as shown in Figure 8.

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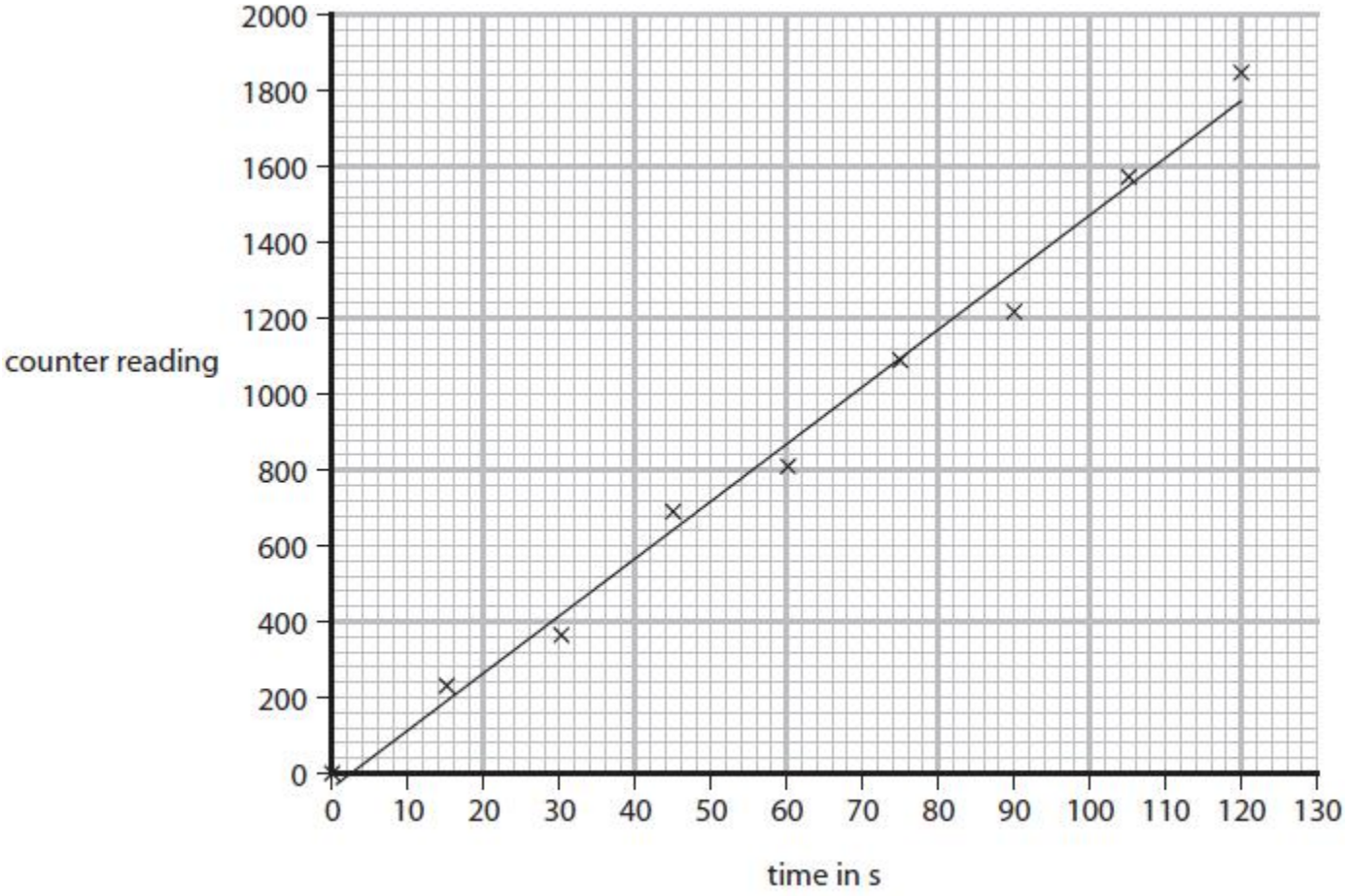


Figure 8

(i) Calculate the average count rate, in counts / s, from the graph.

Show your working on the graph.

(2)

average count rate = ... count / s

(ii) The student says that the experiment must have been done carelessly because the data seemed quite scattered away from the best fit line.

The teacher claims such results should be expected in radioactivity experiments.
Justify the teacher's claim.

(2)

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(Total for question = 4 marks)

Q4.

Radio waves and gamma radiation are at opposite ends of the electromagnetic spectrum.

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Compare how these two electromagnetic radiations are produced.

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(Total for question = 6 marks)

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