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

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**Name of the Student**:_____
**Max. Marks : 22 Marks** **Time : 22 Minutes**

**Q1.**

Carbon-14 is a radioactive isotope that occurs naturally.
Scientists use carbon-14 to help find the age of old pieces of wood.
This technique is called carbon dating.
It uses the idea of half-life.
(a) Which of these describes half-life?

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

**(1)**

☒ **A** the time it takes for half of the undecayed nuclei to decay

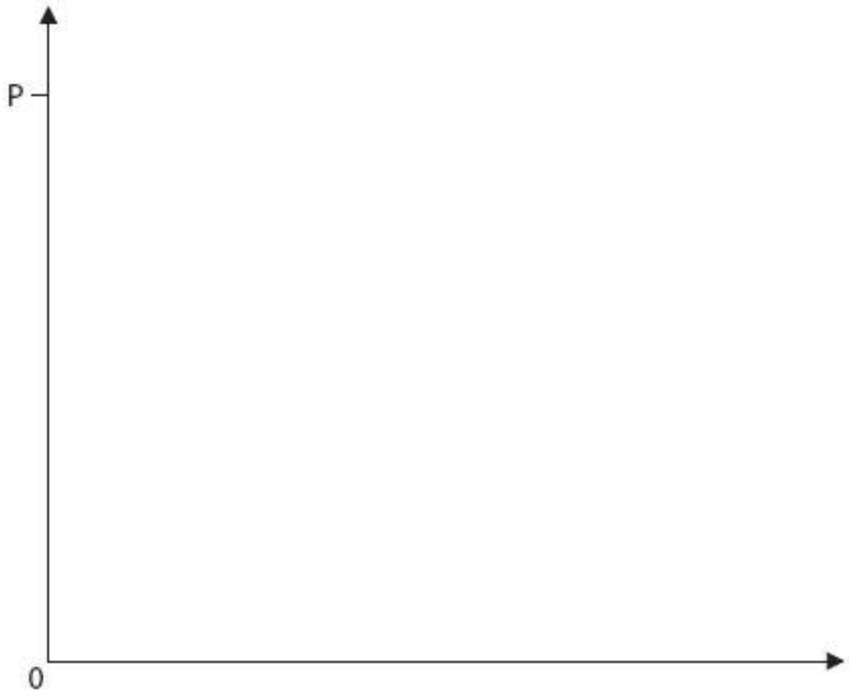
☒ **B** the time it takes for all of the undecayed nuclei to decay

☒ **C** half the time it takes for all of the undecayed nuclei to decay

☒ **D** half the time it takes for half of the undecayed nuclei to decay

(b) Sketch a graph to show how the activity of a radioactive isotope changes with time.
Use the axes below. Start your line from point P.

**(3)**




(c) A scientist investigates an old wooden comb.

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The activity of the carbon-14 in it is 0.55 Bq.

The estimated age of the comb is 11 400 years.

The half-life of carbon-14 is 5700 years.

(i) Calculate the activity of the carbon-14 in the comb when it was new.

**(3)**

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(ii) The scientist takes several readings of background radiation.

Explain why this is necessary to improve the accuracy of the investigation.

**(2)**

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(iii) Old objects like the comb emit a very small amount of radiation.

The activity from the comb is about the same as comes from background radiation.

Scientists have stopped measuring the activity of carbon-14 for carbon dating.

Instead, they can measure the mass of undecayed carbon-14 left in the sample.

Suggest a reason for this change.

**(1)**

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**(Total for Question is 10 marks)**

**Q2.**

Carbon-14 is a radioactive isotope that occurs naturally.
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The half-life of carbon-14 is 5700 years.

(i) Calculate the activity of the carbon-14 in the comb when it was new.

**(3)**

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(ii) The scientist takes several readings of background radiation.

Explain why this is necessary to improve the accuracy of the investigation.

**(2)**

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(iii) Old objects like the comb emit a very small amount of radiation.

The activity from the comb is about the same as comes from background radiation.

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Instead, they can measure the mass of undecayed carbon-14 left in the sample.

Suggest a reason for this change.

**(1)**

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**Q3.**

Figure 3 shows the structure of an oxygen-14 atom.

(i) Complete the four labels on Figure 3.

**(4)**

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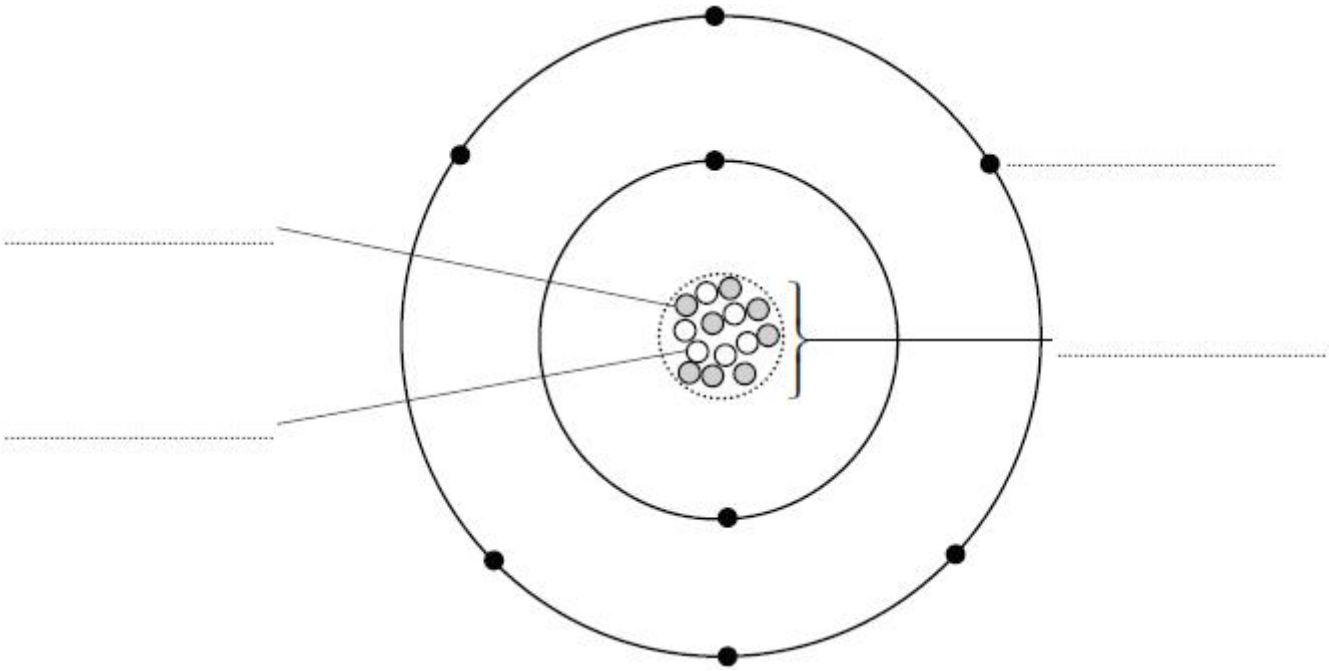


**Figure 3**

(ii) Which of these particles has a negative charge?

**(1)**

- ☒ **A** alpha particle
- ☒ **B** electron
- ☒ **C** neutron
- ☒ **D** nucleus

(iii) State the overall charge of the oxygen-14 atom.

**(1)**

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**(Total for question = 6 marks)**

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