Practice Question Set For A-Level
**Subject : Physics**
**Paper-2 Topic : 11_Nuclear Radiation**

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**Name of the Student**:_____
**Max. Marks : 18 Marks** **Time : 18 Minutes**

**Q1.**

Phosphogypsum is a by-product in the manufacture of fertiliser. It is slightly radioactive because of the presence of radium-226, a radioisotope with a half-life of 1600 years.

It must be stored securely as long as the activity of the radium-226 it contains is greater than 0.4 Bq per gram of phosphogypsum.

(i) In a sample of 1.0 g of phosphogypsum, the activity of radium-226 is 1.3 Bq.

Calculate the number of nuclei of radium-226 in this sample.

**(3)**

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Number of nuclei = .....

(ii) Calculate the time in years it would take before this sample reached the permitted level of decay rate.

**(3)**

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Time = ..... years

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

**Q2.**

The photograph shows the containers of two radioactive sources kept in a school.

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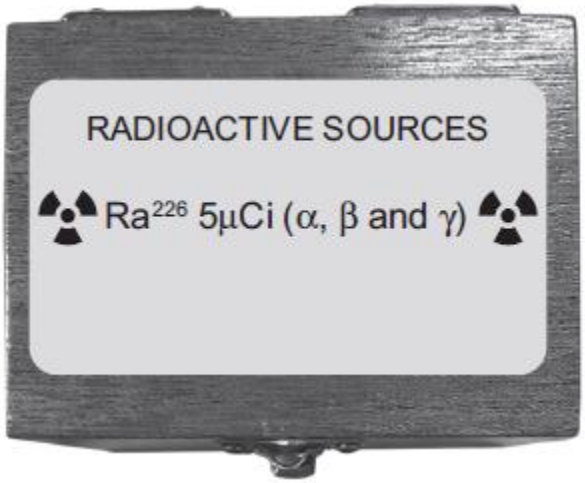


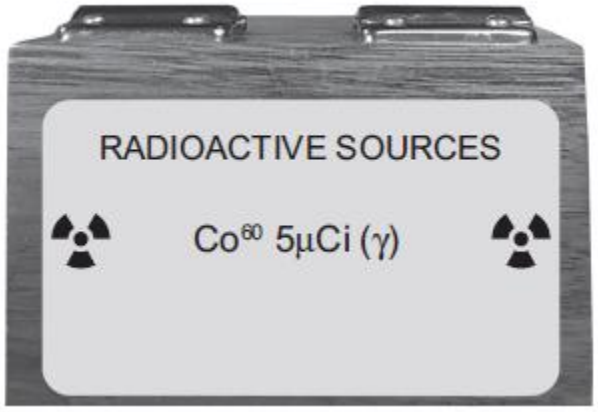


The school is required to make a safety inspection of the sources every year.

(i) Explain how the sources can be tested to ensure that each source is in the correct container.

**(4)**

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(ii) Explain a safety precaution that must be applied during this procedure.

**(2)**

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**Q3.**

In 2012, building commenced on the International Thermonuclear Experimental Reactor (ITER) in France. The aim is for this fusion reactor to be working by 2020.

(a) (i) Describe the process of nuclear fusion.

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(ii) Explain why it is difficult to maintain the conditions needed for nuclear fusion in a reactor.

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(b) Explain why the fusion of hydrogen nuclei should release energy.

**(2)**

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

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