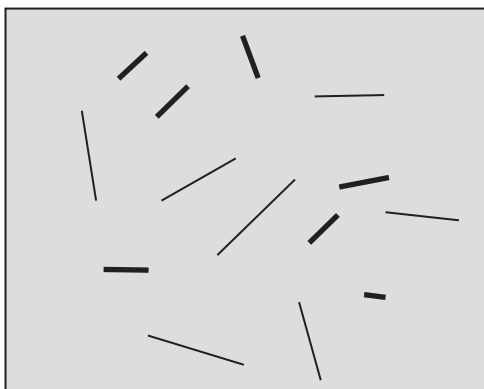


- 7 (a) The diagram shows tracks produced by radiation in a device called a cloud chamber. The tracks are formed when particles ionise the material in the cloud chamber.



Alpha particles produce the shorter, thicker tracks.

Beta particles produce the longer, thinner tracks.

Explain why alpha particles produce the shorter, thicker tracks.

(2)

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- (b) Uranium-235 is an isotope of uranium that can decay by emitting an alpha particle.

(i) Describe what is meant by the term **isotope**.

(2)

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(ii) Complete the equation for the decay of uranium-235

(2)



(iii) Uranium-235 decays to thorium-231 with a half-life of 700 million years.

When a rock was formed, it contained 6400 million uranium-235 nuclei and no thorium-231 nuclei.

Show that after 2100 million years there are seven times more thorium nuclei than uranium nuclei in the rock.

(5)

(Total for Question 7 = 11 marks)

