

- 4 (a) Cobalt-60 is a beta-emitter.

A student has a sample of cobalt-60 inside a box. The student defines the half-life of cobalt-60 as the time taken for the number of nuclei inside the box to decay to one half of its initial value.

For  
Examiner's  
Use

State and explain one reason why this definition is inappropriate.

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.....  
..... [2]

- (b) A mass of  $4.3 \times 10^{-9}$  g of cobalt-60 is found to have an activity of  $1.8 \times 10^5$  Bq.

Calculate the half-life, in years, of cobalt-60.

half-life = ..... years [4]