

- 12 (a) Radioactive decay is both spontaneous and random.

State what is meant by:

1. *spontaneous decay*
.....
 2. *random decay*.
.....
- [2]

- (b) Strontium-90 ($^{90}_{38}\text{Sr}$) is an unstable nuclide.

The activity of a sample of 1.0×10^{-9} kg of strontium-90 is 5.2 MBq.

- (i) Determine the decay constant λ of strontium-90.

$$\lambda = \dots\dots\dots \text{s}^{-1} \quad [3]$$

- (ii) The activity of the sample after a time of 1.0 half lives is found to be greater than the expected 2.6 MBq.

Suggest a possible reason for this.

.....
..... [1]

[Total: 6]

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