

Answer ALL questions.

1 Alpha and beta particles may be emitted by unstable nuclei.

(a) (i) When an unstable nucleus emits an alpha particle, its atomic (proton) number

(1)

- ☐ **A** increases by 1
- ☐ **B** stays the same
- ☐ **C** decreases by 2
- ☐ **D** decreases by 4

(ii) When an unstable nucleus emits an alpha particle, its mass (nucleon) number

(1)

- ☐ **A** increases by 1
- ☐ **B** stays the same
- ☐ **C** decreases by 2
- ☐ **D** decreases by 4

(b) Compared to a beta particle, an alpha particle

(1)

- ☐ **A** causes less ionisation
- ☐ **B** has less charge
- ☐ **C** has less mass
- ☐ **D** has less penetrating power



(c) Describe how a teacher should measure the activity of a radioactive source using a Geiger-Muller detector.

(4)

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(Total for Question 1 = 7 marks)

