

- 7 (a) Two isotopes of uranium are uranium-235 ( $^{235}_{92}\text{U}$ ) and uranium-238 ( $^{238}_{92}\text{U}$ ).

- (i) Describe in detail an atom of uranium-235.

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- (ii) With reference to the two forms of uranium, explain the term *isotopes*.

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- (b) When a uranium-235 nucleus absorbs a neutron, the following reaction may occur:



- (i) Determine the values of  $Y$  and  $Z$ .

$Y = \dots$

$Z = \dots$

[2]

- (ii) Explain why the sum of the masses of the uranium nucleus and of the neutron does not equal the total mass of the products of the reaction.

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