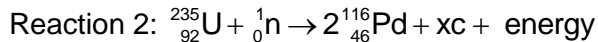
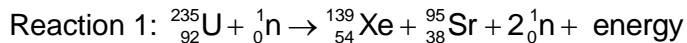


- 7 A nucleus of Uranium-235 may be made to undergo fission when bombarded by a neutron. When Uranium-235 nuclei undergo fission with a slow-moving neutron, two possible reactions that may occur are



- (a) For reaction 2, identify the particle c and the number x of such particle(s) produced in this reaction.

particle c = .....

x = ..... [2]

- (b) The binding energy per nucleon  $E$  for a number of nuclides is given in Fig. 7.1.

Nuclide	$E / \text{MeV}$
$^{95}_{38}\text{Sr}$	8.74
$^{139}_{54}\text{Xe}$	8.39
$^{235}_{92}\text{U}$	7.60

**Fig. 7.1**

- (i) Explain what is meant by *binding energy* of a nucleus.

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

- (ii) Determine the energy released in reaction 1.

energy released = ..... J [2]

- (iii) Hence, calculate the loss in mass in reaction 1.

loss in mass = ..... kg [2]

- (iv) The energy released in reaction 2 is 163 MeV. Suggest, with a reason, which of the two reactions is more likely to occur.

.....  
 .....  
 .....  
 .....  
 ..... [3]