8 One possible reaction taking place in the core of a reactor is

$$^{235}_{92}\text{U} + ^{1}_{0}\text{n} \rightarrow ^{95}_{42}\text{Mo} + ^{139}_{57}\text{La} + 2^{1}_{0}\text{n} + 7^{0}_{-1}\text{e}$$

	mass
$^{235}_{92}$U	235.123 u
$^{95}_{42}$Mo	94.945 u
$^{139}_{57}$La	138.955 u
proton	1.007 u
neutron	1.009 u

(a) Explain why large nuclei such as uranium-235 are used in nuclear fission reactor in a power plant.

……

…… [1]

Ignore the mass of electron. Using the data above,

(b) show that the energy released per fission of uranium is 200 MeV,

[3]

(c) calculate the energy available from the complete fission of 1.00 g of uranium-235, and

energy = …….. J [2]

(d) the mass of uranium-235 used by a 500 MW nuclear power station in one hour, assuming 30% efficiency.

mass = …….. g [2]