Question number	Answer	Notes	Marks
4 (a) (i)	uranium/plutonium;	allow chemical symbols	1
(ii)	(particles) formed **after** fission/**after** U breaks up; plus any **one** from:- neutron; daughter nuclei; named products;	do not allow after decay allow gamma (radiation)	2
(iii)	MP1 they are (still) radioactive/ emit ionising radiation /eq; MP2 they last for a very long time/have a long half-life/eq;	allow harmful to people/environment	2
(iv)	it slows down neutrons/eq;	ignore absorbs neutrons	1
(v)	any two ideas from:- MP1 fewer neutrons would be absorbed; MP2 fission rate would increase / /(reactor) become critical ; MP3 too much energy produced (too fast); MP4 meltdown of core/reactor;	more neutrons available the reaction would go out of control do not accept “turns into a bomb” meltdown of ‘it’	2

(b) (i)	773(K);		1
(ii)	substitution; rearrangement; evaluation; e.g. $\frac{8.4}{773} = \frac{P_2}{1170}$ $P_2 = \frac{8.4 \times 1170}{773}$ 13 (MPa)	no mark for the equation rearrangement and substitution in either order 12.7 allow ecf from (b)(i) for all 3 marks if calculation seen with °C for T_1 instead of K, then max mark = 2 answer of 19.7 (MPa) with no working = 1 mark total marks = 12	3