Question number	Answer	Notes	Marks
6 (a)	17 (degrees);	Allow in range 15-19 degrees	1
(b)	refractive index = sin(i) / sin (r);	accept n or η for refractive index accept any valid rearrangement	1
(c)	substitution; evaluation of either sine correctly; evaluation; e.g. refractive index = sin(29)/sin(17) refractive index = 0.484…/0.292… refractive index = 1.7	allow ecf from (a) 0.48480962/0.292371705 1.6581961	3

(Total for Question 6 = 5 marks)

Question number	Answer	Notes	Marks
10 (a)	236 – (97 + 135); x = 4;	answer of 4 scores 2	2
(b)	(fission) releases neutrons; neutrons can be captured by other uranium **nuclei**; (these nuclei) then undergo fission;		3
(c)	evidence of halving of 72 (kBq); evidence of four half-lives required; e.g. count rate after 4 half-lives is 4.5 (kBq) evidence that four half-lives is equivalent to 60 million years;		3
(d)	Any FIVE from: MP1 Idea of strong containers; MP2 idea that containers can't rust; MP3 idea that rust-proof containers expensive/difficult to manufacture; MP4 reference to security of waste site; MP5 reference to dilution in sea water; MP6 reference to leakage into water table;	 accept idea of a location that prevents rust accept low earthquake risk	5

(Total for Question 10 = 13 marks)