Question number	Answer	Notes	Marks
1 (a) (i)	C - 14		1
(ii)	B - 8		1
(iii)	A - 6		1
(b)	A - An electron		1
(c)	A - 1.5 g		1
(d)	Atoms/nuclei with same number of protons / same atomic number / same element; Different numbers of neutrons / different mass number / different atomic mass;	ALLOW ‘different mass’ for second mark if it’s clear they are comparing atoms within the same element rather than different elements IGNORE references to electrons if possible, but if candidates makes an incorrect reference to electrons then list principle applies for that mark (e.g ’same number of protons but different number of neutrons and electrons’ = 1)	1 1
		Total	**7**

Question number	Answer	Notes	Marks
11 (a) (i)	gravitational potential energy = mass x gravitational field strength x height;	ALLOW standard symbols (m x g x h) DO NOT ALLOW 'gravity' for g	1
(ii)	substitution into correct equation;		1
	calculation; e.g. g.p.e. = 2000 x 10 x 128 2.56 (MJ)	answer given to at least 3 sf Allow J if correct (2560 000)	1
(b) (i)	2.56 (MJ);	Value from (a) (ii) / 2.6 MJ	1
(ii)	They are <u>equal</u> / k.e. = work done;		1
(iii)	work done = force x distance;	ALLOW standard symbols	1
(iv)	Substitution into correctly rearranged equation;	Allow ecf for value of energy stated in (a) (ii) or (b) (i)	1
	Calculation; e.g. d = W / F = 2 560 000 / 32 000 80 (m)		1

Question Number	Answer	Notes	Marks
11 (c)	Any TWO from (Windy) – (extra) drag / air resistance / friction; more energy wasted (overcoming friction); (Wet) – less friction / no friction / slippier / less traction / less grip; less energy transferred to car (at launch);	ANSWERS SHOULD REFER TO THE SITUATIONS GIVEN	2
		Total	**10**