PERIODIC TABLE 1

MARK SCHEME

Question 1

Question	Answers	Extra information	Mark
(a)	number		1
(a)	0	allow 8	1
(b)(i)	an alkali metal		1
(b)(ii)	a transition metal		1
(c)	for undiscovered elements	accept so elements with similar properties were in the same groups accept so elements fitted the pattern of properties	1
Total			5

Question 2

Question	Answers	Extra information	Mark
(i)	B		1
(ii)	E		1
(iii)	F		1
(iv)	D		1
(v)	C		1
Total			5

Question 3

Question	Answers	Extra information	Mark
(i)	A correct link between any two named elements eg same group / column same properties / number of outer electrons	Allow some link between any two elements in the same group (in both Newlandsí and or the modern periodic table)	1
(ii)	Any two from: • elements still being discovered or no gaps for	Ignore statements about lack of evidence / proof	2

	undiscovered elements • some boxes have 2 elements in them • metals and non-metals in same column / mixed up • pattern for first 16 or so elements only	accept some elements in same column have different properties. allow any sensible suggestion about misplaced elements eg copper in group 1 elements allow did not work for all elements	
Total			3

Question 4

Question	Answers	Extra information	Mark
(a)(i)	A		1
(a)(ii)	F		1
(a)(iii)	E		1
(a)(iv)	C		1
(a)(v)	A or B		1
Total			5

Question 5

Question	Answers	Extra information	Mark
(a)	Left gaps If placed consecutively, then elements would be in wrong group / have wrong properties	Allow some elements didn't fit pattern	1 1
(b)	(elements placed in) atomic / proton number order (elements in) same group have same number of outer electrons any one from: • number of protons =		1 1 1

	number of electrons • reactions (chemical) properties depend on the (outer) electrons • number of shells gives the period	allow number of shells increases down the group	
(c)(i)	(transition elements usually) have same / similar number of outer / 4th shell electrons inner (3rd) shell / energy level is being filled	ignore shells overlap	1 1
(c)(ii)	2nd shell / energy level can (only) have maximum of 8 electrons or 2nd shell / energy level cannot have 18 electrons		1
Total			8

Question 6

Question	Answers	Extra information	Mark
(a)(i)	Element		1
(a)(ii)	atomic weight		1
(a)(iii)	atomic (proton) number		1
(b)(i)	transition metals		1
Total			4

Question 7

Question	Answers	Extra information	Mark
(a)	40 (Ca) + 137 (Ba)/ 2 = 88.5	accept a recognition that the average is near 88 **or** it is the average of the other two accept Sr is midway between Ca and Ba	1
(b)	E.g. newly discovered elements / atoms didn't	he = Dobereiner	1

	fit (into triads) or didn't apply to all elements / atoms or lot of exceptions	ignore Mendeleev left spaces or not enough evidence	
(c)(i)	same number of electrons in outer shell	accept energy level for shell accept a correct reference to a specific group eg (all) have one electron in outer shell / (all) lose one electron (when they react)	1
(c)(ii)	electrons fill an inner / 3rd shell (usually) same number of outer / 4th shell electrons	accept energy level for shell accept d-level being filled accept specific reference to 3rd shell accept descriptions in terms of 3d & 4s etc.	1 1
Total			5