METALS & NON-METALS 1

MARK SCHEME

Q1.

Question	Answer	Extra information	Marks
	They are harder than Group 1 metals. They have higher melting points than Group 1 metals. They often form coloured compounds but Group 1 compounds are usually white.		1 1 1
Total marks			3

Q2.

Question	Answer	Extra information	Marks
	any two from: • stronger / harder • less reactive • higher melting points	statements must be comparative ignore higher densities ignore boiling point	2
Total marks			2

Q3.

Question	Answer	Extra information	Marks
(i)	B		1
(ii)	A		1
(iii)	E		1
(iv)	D		1
Total marks			4

Q4.

Question	Answer	Extra information	Marks
	sodium and nickel are both metals sodium is more reactive than nickel		1 1
Total marks			2

Q5.

Question	Answer	Extra information	Marks
(a)	Li and K	either order allow lithium and potassium	1
(b)	Fe	allow iron	1
(c)	Cu	Allow copper	1
Total marks			3

Q6.

Question	Answer	Extra information	Marks
	has a higher melting point is harder		2
Total marks			2

Q7.

Question	Answer	Extra information	Marks
	copper has delocalized electrons (electrons) which can move through the metal / structure	accept copper has free electrons ignore sea of electrons or mobile electrons allow (electrons) which can carry a charge through the metal / structure	1 1
Total marks			2

Q8.

Question	Answer	Extra information	Marks
	because atoms / ions / particles in alloy are different (sizes) so, layers distorted (and layers / atoms / ions / particles) don't slide or slide less easily	do not allow reference to molecules ignore reference to compounds accept all marking points in a suitably labelled or annotated diagram if no other mark awarded accept an alloy is a mixture or contains different metals / elements for 1 mark	1 1 1
Total marks			3

Q9.

Question	Answer	Extra information	Marks
(a)	any one from: • they are made of layers • atoms / ions / particles / layers (of atoms) can slide over each other	do not accept line / rows / lattice	1
(b)	any one from: • smaller / tiny or very small • correct size range 1 to 100 nanometres • a few hundred atoms in size	do not allow small alone if they state smaller and give a size outside range ignore size if it is less than 20,000	1
(c)	harder plus **one** from: • so does not wear as quickly / erode as quickly • less vulnerable to damage owtte	 ignore corrode harder to wear down = 1 mark	1 1

	• because they have a high surface area to volume ratio **or** stronger (1) plus one from: (1) • less likely to break / do not break • not as vulnerable to damage owtte • do not bend out of shape • because they have a high surface area to volume ratio	accept withstand pressure harder and stronger alone gains 1 mark	
Total marks			4

Q10.

Question	Answer	Extra information	Marks
	any two from: • outer shell electrons / electrons in highest energy level (in metals) • electrons are delocalised / sea of electrons • electrons are free or electrons move around or electrons are free to flow or electrons attracted to positive terminal • electrons carry charge / current or electrons form the current / electrons transfer charge /electrons pass charge	ignore electrons carry electricity ignore reference to positively charged atoms / ions if they state electrons have +ve charge = max 1 mark if they state covalent bonding then max 1 mark	2
Total marks			2

Q11.

Question	Answer	Extra information	Marks
	any four from: • giant structure / lattice • positive ions • sea of electrons or delocalised / free electrons • awareness of outer shell / highest energy level electrons are involved • (electrostatic) attractions / bonds between electrons and positive ions • bonds / attractions (between atoms/ ions) are strong • a lot of energy / heat is needed to break these bonds / attractions	max 3 marks if any reference made to covalent / ionic bonding / molecules or intermolecular forces or graphite / diamond or forces of attraction between electrons and then ignore throughout ignore layers ignore electrons can move allow hard to break for strong ignore forces unqualified ignore high temperature	4
Total marks			4

Q12.

Question	Answer	Extra information	Marks
	• made of layers / rows (atoms /ions/particles) • which can slide / slip (over each other) **or** particles / ions / atoms can slide over each other	ignore free / delocalized electrons reference to incorrect particles / covalency / intermolecular forces = max 1 ignore malleable / ductile / weak bonds	1 1
Total marks			2