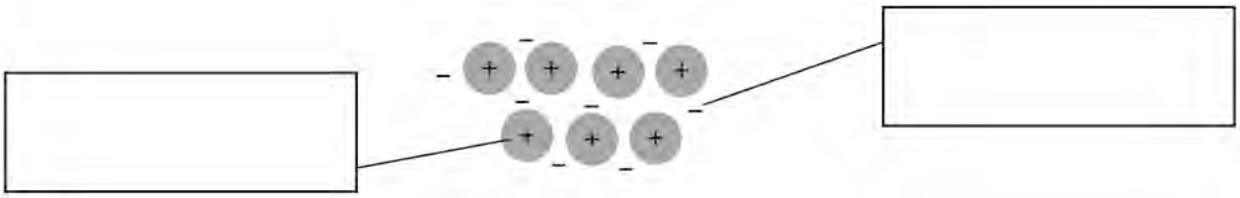
1.

(i) Which model is an alloy?

Put a (ring) around the correct answer.

[1]

(ii) Label the diagram below to describe metallic bonding.



[1]

2(a). Kay is a geologist. She takes samples of minerals from a range of rocks and tests them.

The table shows her results.

Mineral	Melting point	Electrical conductivity of solid	Electrical conductivity when molten	Electrical conductivity when dissolved in water
A	high	good	good	does not dissolve in water
B	high	does not conduct	does not conduct	does not dissolve in water
C	high	does not conduct	good	good

How does the data show that all of the minerals are solids at room temperature?

---

[1]

(b). Kay thinks that the mineral samples contain a metal, an ionic compound and a covalent compound.

Explain the conclusions you can draw from Kay's results about the bonding in the minerals.

(i) Mineral **A**

---[2]

(ii) Mineral **B**

---[2]

(iii) Mineral **C**

---[2]

END OF QUESTION PAPER

Question			Answer/Indicative content	Marks	Guidance
1		i	Middle diagram ringed ✓	1 (AO 1.1)	Examiner's Comments The higher ability candidates often recognised the significance of the second diagram, and correctly stated that this showed the alloy.
		ii	Left-hand box: (lattice of) metal/positive ion(s) **AND** Right-hand box: ('sea' of freely moving / delocalised) electron(s) ✓	1 (AO 1.1)	Examiner's Comments Many candidates gave answers such as "positive" and "negative" for the two boxes. Others showed a partial understanding and correctly identified the electrons, sometimes even referring to them as delocalised. The left-hand box proved more problematic, with "protons" being a common response.
			Total	2	
2	a		they all have high melting points ✓	1	
	b	i	**A** is a metal / has metallic bonding ✓ because it conduct electricity when solid and molten ✓	2	
		ii	**B** is a covalent compound ✓ because it does not conduct when solid or molten ✓	2	
		iii	**C** is an ionic compound✓ because it does not conduct when solid but does conduct when molten✓	2	
			Total	7	