

Section B

Answer **all** questions in the spaces provided.

7 Iodine and graphite are both solids. When iodine is heated gently a purple vapour is seen. Graphite will not melt until the temperature reaches 4000 K. Graphite conducts electricity but iodine is a very poor conductor of electricity.

7 (a) State the type of crystal structure for each of iodine and graphite.

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(2 marks)

7 (b) Describe the structure of and bonding in graphite and explain why the melting point of graphite is very high.

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(4 marks)

(Extra space)

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7 (c) Explain why iodine vaporises when heated gently.

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(2 marks)

7 (d) State why iodine is a very poor conductor of electricity.

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(1 mark)

9

Turn over for the next question

Turn over ►



Qu	Part	Sub Part	Marking Guidance	Mark	Comments
7	a		Iodine – <u>molecular</u>	1	Not covalent lattice
			Graphite- macromolecular/giant covalent/giant atomic	1	
7	b		<u>Layers</u> of (C atoms)	1	If any other element mentioned other than C, CE = 0 Ignore the no of covalent bonds around the C if mentioned The first 3 marks could be scored with a <u>labelled diagram</u> . Need to label or state covalent bonds within the layers. Covalent or ionic or metallic bonds between molecules CE = 0
			Connected by <u>covalent bonds</u> within each layer	1	
			<u>Van der Waals forces/ IMF</u> between layers/ weak forces between layers	1	
			<u>Many/strong covalent bonds need to be broken</u>	1	
7	c		Van der Waals forces are weak or easily broken	1	Not vdw between atoms
			Van der Waals <u>between molecules</u> (or implied)	1	Allow weak IMF = 2
7	d		Does not have delocalised/free <u>electrons</u>	1	Only allow answer with respect to iodine Not all electrons used in bonding Ignore free ions