



2. Given the electronic configurations of four atoms, shown below, give the properties of the substances given.

Atom "A"-  $1s^2, 2s^2 2p^5$

Atom "B"-  $1s^2, 2s^2 2p^5, 3s^2, 3p^6 4s^1$

Atom "C"-  $1s^2, 2s^2 2p^5, 3s^2, 3p^4$

Atom "D"-  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^2$

- a. Compound formed between atoms A and B

i. Formula \_\_\_\_\_

ii. BP \_\_\_\_\_ High \_\_\_\_\_ Low

iii. Conducts electricity? Circle the correct responses

in solid state, in liquid state, in aqueous state, does not conduct

- b. Compound formed between atoms A and C

i. Formula \_\_\_\_\_

ii. BP \_\_\_\_\_ High \_\_\_\_\_ Low

iii. Conducts electricity? Circle the correct responses

in solid state, in liquid state, in aqueous state, does not conduct

- c. A substance made of atom D

i. Electronic configuration of the particles found in the solid state.

\_\_\_\_\_

ii. BP \_\_\_\_\_ High \_\_\_\_\_ Low

iii. Conducts electricity? Circle the correct responses

in solid state, in liquid state, in aqueous state, does not conduct

3. Match the property with Different types of bonding lead to different physical properties.

Match each property of a substance with the structural feature, listed below, that best explains it by writing the correct letter in the space provided. Structural features can be used more than once and there may be more than one feature for each property. 10 marks

- A. Presence of delocalised electrons that can move through the positive ion lattice structure
- B. Strong electrostatic attractions between oppositely charged ions in a lattice
- C. Layers of atoms with mobile electrons within each layer
- D. Repulsion between like charges when layers shift in the lattice
- E. Non-directional metallic bonding, allowing layers of atoms to slide past each other without breaking bonds
- F. 3-D covalent lattice
- G. Weak intermolecular forces
- H. Small symmetrical molecules

<u>Property of the substance</u>	<u>Structural feature</u>
i. Electrical conductivity in solid state	_____
ii. High melting point	_____
iii. Brittleness	_____
iv. Malleability	_____
v. Electrical conductivity of graphite	_____
vi. Lustrous	_____
vii. Sublimes at very high temperatures	_____
viii. Conducts electricity only in liquid and aqueous states	_____
ix. Low BP and MP	_____
x. Gas at room temperature	_____



5. Below are several properties of metals. Circle the properties that the metallic bonding model cannot explain.

i. Density

ii. Reactivity

iii. Conductivity

iv. Malleability

v. High melting temperature

vi. Magnetism

vii. Ductility

viii. Lustre

ix. Why mercury is a liquid at room temperature.