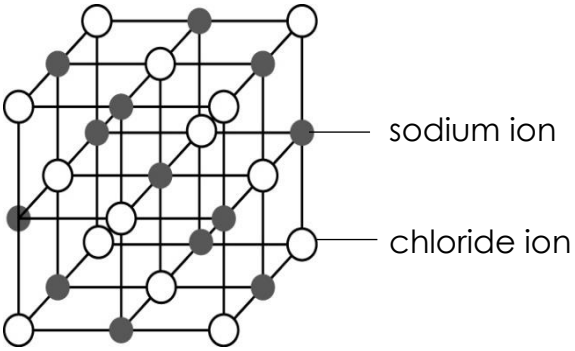
**Quiz (Structures and Properties of Substances)**

**Section A: Multiple-choice**

Questions 1 and 2 refer to the structure of sodium chloride:

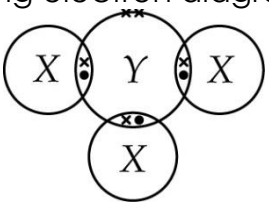



1. What type of attractions is present in sodium chloride?
   A. Covalent bond
   B. Ionic bond
   C. Metallic bond
   D. Van der Waals' forces

2. How many chloride ions are there surrounding a sodium ion in the structure?
   A. 2
   B. 4
   C. 6
   D. 8

3. Which of the following types of bonding are non-directional?
   (1) Metallic bond (2) Ionic bond (3) Covalent bond
   A. (1) and (2) only
   B. (1) and (3) only
   C. (2) and (3) only
   D. (1), (2) and (3)

4. A compound has the following electron diagram:




   If *Y* is a Period 2 element, what is *Y*?
   A. Beryllium
   B. Boron
   C. Carbon
   D. Nitrogen

5. Which of the following substances conducts electricity in liquid state but NOT in solid state?
   A. Hydrogen chloride
   B. Ethanol
   C. Mercury
   D. Lead(II) bromide

6. Which of the following statements about graphite is INCORRECT?
   A. It has a giant covalent structure.
   B. Weak van der Waals' forces are present in the structure of graphite.
   C. It has a low melting point.
   D. It conducts electricity in solid state.

7. A solid has a high melting point and conducts electricity in molten state. The solid probably has a
   (1) giant ionic structure.
   (2) giant metallic structure.
   (3) giant covalent structure.
   A. (1) and (2) only
   B. (1) and (3) only
   C. (2) and (3) only
   D. (1), (2) and (3)

8. The electronic arrangements of elements *P* and *Q* are 2, 1 and 2, 8, 6 respectively. Which of the following statements about the compound formed between *P* and *Q* is INCORRECT?
   A. The chemical formula of the compound is $P_2Q$.
   B. The solid state of the compound is white in colour.
   C. The compound is insoluble in water.
   D. The compound conducts electricity in molten state.

**Section B: Structured questions**

Silicon carbide has a structure similar to that of diamond. Its chemical formula is SiC.

(a) Draw the structure of silicon carbide.

(b) State and explain whether silicon carbide has a high melting point.

(c) Besides having a high melting point, suggest ONE property of silicon carbide.

(d) Suggest ONE use of silicon carbide.

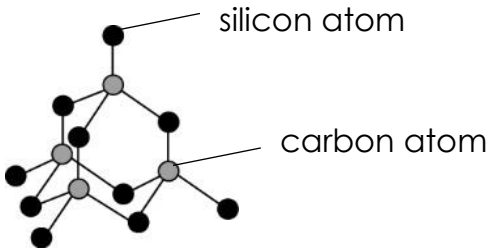
**Suggested Answer**

**Section A**

| | | | |
|---|---|---|---|
| 1. | B | 5. | D |
| 2. | C | 6. | C |
| 3. | A | 7. | A |
| 4. | D | 8. | C |

**Section B**

(a)




(b) Silicon carbide has a high melting point.
It has a giant covalent structure.
The atoms are held together by strong covalent bonds. A lot of energy is required to break the bonds.

(c) It is hard / is insoluble in any solvents / does not conduct electricity.

(d) It can be used as abrasives / heat insulator / cutting tools.