

**1. Nov/2022/Paper\_11/No.6**

Which molecule has an equal number of bonding electrons and lone-pair electrons?

- A**  $\text{BH}_3$                       **B**  $\text{CO}_2$                       **C**  $\text{F}_2\text{O}$                       **D**  $\text{SO}_2$

**2. Nov/2022/Paper\_11/No.7**

The table shows properties of four solids held together by different types of bonding.

Which row correctly describes the properties of a solid with a giant covalent structure?

	melting point	solubility in polar solvents
<b>A</b>	high	insoluble
<b>B</b>	high	soluble
<b>C</b>	low	insoluble
<b>D</b>	low	soluble

**3. Nov/2022/Paper\_12/No.12**

The compound  $(\text{CH}_3)_3\text{NAlCl}_3$  has a simple molecular structure.

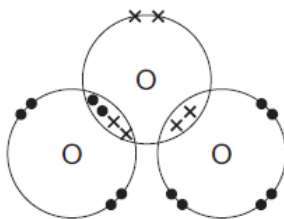
Which statement about  $(\text{CH}_3)_3\text{NAlCl}_3$  is correct?

- A**  $(\text{CH}_3)_3\text{NAlCl}_3$  molecules attract each other by hydrogen bonds.  
**B** The Al atom in  $(\text{CH}_3)_3\text{NAlCl}_3$  has an incomplete valence shell of electrons.  
**C** The bonds around the Al atom are planar.  
**D** The molecules contain coordinate bonding.

**4. Nov/2022/Paper\_12/No.13**

VSEPR theory should be used in answering this question.

The dot-and-cross diagram for an ozone,  $\text{O}_3$ , molecule is shown.



What is the predicted bond angle in this molecule?

- A**  $107^\circ$                       **B**  $109.5^\circ$                       **C**  $117^\circ$                       **D**  $120^\circ$

5. Nov/2022/Paper\_22/No.1(a)

Species such as  $\text{NH}_4^+$ ,  $\text{CO}_3^{2-}$  and  $\text{PO}_4^{3-}$  are examples of molecular ions.

(a) Ionic and covalent bonds both involve an electrostatic attraction between different species.

Identify the species that are electrostatically attracted to one another in:

- an ionic bond

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- a covalent bond.

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[2]

