

27. Which one of the following pairs exhibits the same hybrid orbitals of central atom?

- A.  $\text{PCl}_3$  and  $\text{NH}_3$
- B.  $\text{PCl}_3$  and  $\text{BCl}_3$
- C.  $\text{NCl}_3$  and  $\text{AlCl}_3$
- D.  $\text{BeCl}_2$  and  $\text{H}_2\text{O}$

28. In hybridisation process of  $\text{ICl}_3$  molecule, \_\_\_\_\_ electron/electrons in 5p orbital excited to 5d orbitals before it form \_\_\_\_\_ hybrid orbital.

- A. 3,  $\text{sp}^3\text{d}$
- B. 1,  $\text{sp}^3$
- C. 1,  $\text{sp}^3\text{d}$
- D. 3,  $\text{sp}^3$

29. During melting, the intermolecular forces are overcome by heat supplied. Choose the **incorrect** pair.

	Substance	Force being overcome
A.	Ice	hydrogen bonds between $\text{H}_2\text{O}$ molecules
B.	Sulphur	van der Waal's forces between $\text{S}_8$ molecules
C.	Sodium chloride	ionic bond between opposite charged ions
D.	Naphthalene	Van der Waals forces between naphthalene molecules

30. The following statements is true **except**

- A.  $\text{C}_4\text{H}_{10}$  has higher boiling point than  $\text{C}_3\text{H}_8$  because it has higher molar mass hence  $\text{C}_4\text{H}_{10}$  have stronger London dispersion forces.
- B.  $\text{C}_2\text{H}_6$  has higher boiling point than  $\text{CH}_3\text{F}$  because  $\text{C}_2\text{H}_6$  higher molar mass.

- C.  $\text{Cl}_2$  has higher molar mass than  $\text{C}_4\text{H}_{10}$  thus stronger London dispersion forces thus  $\text{Cl}_2$  has higher boiling point.
- D. Because of dipole-dipole forces are stronger than dispersion forces,  $\text{ICl}$  has higher boiling point than  $\text{Br}_2$ .

31. Between ethanol,  $\text{C}_2\text{H}_5\text{OH}$ , and water,  $\text{H}_2\text{O}$ , which one have higher boiling point? Explain.

- A. Ethanol has higher boiling point than water because it has greater molar mass.
- B. Ethanol has lower boiling point than water because it cannot form hydrogen bond between molecules.
- C. Water has higher boiling point than ethanol because water can form more intermolecular hydrogen bond.
- D. The boiling point of both are not much different because both molecules can form hydrogen bond.

32. Hydrogen fluoride has higher boiling point than ammonia. Choose the most **accurate** statement to explain this.

- A. Fluorine is less electronegative than nitrogen. Thus, hydrogen bond is stronger.
- B. Fluorine is more electronegative than nitrogen. Thus, hydrogen bond is stronger.
- C. Hydrogen fluoride forms more hydrogen bonds per molecule than ammonia can form.
- D. The fluorine-hydrogen bond is stronger than the nitrogen-hydrogen bond.