

## Chapter 2 Structure and Bonding

- Which of the following will conduct electricity?  
(A) Solid metallic Na  
(B) Solid NaCl  
(C) Aqueous NaCl  
(D) Fused NaCl
- On the basis of VSEPR theory, the molecule which has a linear structure are  
(A) N<sub>2</sub>O  
(B) XeF<sub>2</sub>  
(C) SO<sub>2</sub>  
(D) CO<sub>2</sub>
- Which of the following molecules will have zero dipole moment?  
(A) CO<sub>2</sub>  
(B) BF<sub>3</sub>  
(C) SiCl<sub>4</sub>  
(D) NH<sub>3</sub>
- Among the following the planar molecules are  
(A) PtCl<sub>4</sub><sup>2-</sup>  
(B) [CO<sub>3</sub>]<sup>2-</sup>  
(C) [SO<sub>4</sub>]<sup>2-</sup>  
(D) PCl<sub>3</sub>
- Molecule that has two lone pair of electrons on the central atom (among the choices) are  
(A) XeF<sub>4</sub>  
(B) PF<sub>3</sub>  
(C) ClF<sub>3</sub>  
(D) BF<sub>3</sub>
- Among B–H, C–H, N–H and Si–H bonds in BH<sub>3</sub>, CH<sub>4</sub>, NH<sub>4</sub>, and SiH<sub>4</sub>, respectively, the polarity of the bond which is shown CORRECTLY are  
(A) B<sup>δ+</sup> – H<sup>δ-</sup>  
(B) C<sup>δ-</sup> – H<sup>δ+</sup>  
(C) N<sup>δ-</sup> – H<sup>δ+</sup>  
(D) Si<sup>δ-</sup> – H<sup>δ+</sup>
- Among the following pairs, the paramagnetic and diamagnetic species, respectively, are  
(A) NO and CO  
(B) O<sub>2</sub> and N<sub>2</sub>  
(C) O<sub>2</sub><sup>+</sup> and O<sub>2</sub><sup>-</sup>  
(D) N<sub>2</sub><sup>+</sup> and O<sub>2</sub><sup>2-</sup>
- The molecules having non-linear structure are  
(A) SCl  
(B) ClO<sub>2</sub><sup>-</sup>  
(C) XeF<sub>2</sub>

- (D)  $\text{N}_2\text{O}$
9. Which of the following statements are CORRECT about the diborane molecule?
- (A) B-H<sup>t</sup> bond is a 2-centre-2-electron bond (H<sup>t</sup>: terminal hydrogen)
  - (B) BH<sup>b</sup>B bond is a 3-centre-2-electron bond (H<sup>b</sup>: bridged hydrogen)
  - (C) The bond angle H<sup>t</sup>BH<sup>t</sup> is  $122^\circ$  (H<sup>t</sup>: terminal hydrogen)
  - (D) The B-H<sup>t</sup> bond distance is longer than B-H<sup>b</sup> bond distance (H<sup>t</sup>: terminal hydrogen, H<sup>b</sup>: bridged hydrogen)
10. The electron-deficient molecules are
- (A)  $\text{B}_2\text{H}_6$
  - (B)  $\text{N}_2\text{H}_4$
  - (C)  $\text{AlH}_3$
  - (D)  $\text{C}_2\text{H}_6$

**Answer**

- 1. (A), (C), (D)
- 2. (A), (B), (D)
- 3. (A), (B), (C)
- 4. (A), (B)
- 5. (A), (C)
- 6. (A), (B), (C)
- 7. (A), (B), (D)
- 8. (A), (B)
- 9. (A), (B), (C)
- 10. (A), (C)