## Polarisation and Fajan's rule

1. $BF_3$ and $NF_3$both molecules are covalent, but $BF_3$ is non-polar and $NF_3$ is polar. Its reason is
   (a) In uncombined state boron is metal and nitrogen is gas
   (b) $B-F$bond has no dipole moment whereas $N-F$ bond has dipole moment
   (c) The size of boron atom is smaller than nitrogen
   (d) $BF_3$ is planar whereas $NF_3$ is pyramidal

2. Which one is polar molecule among the following
   (a) $CO_2$ (b) $CCl_4$
   (c) $H_2O$ (d) $CH_4$

3. If the electron pair forming a bond between two atoms *A* and *B* is not in the centre, then the bond is
   (a) Single bond (b) Polar bond
   (c) Non-polar bond (d) $\pi$bond

4. Which of the following liquids is not deflected by a non-uniform electrostatic field
   (a) Water (b) Chloroform
   (c) Nitrobenzene (d) Hexane

5. Which of the following is non-polar
   (a) $H_2S$ (b) $NaCl$
   (c) $Cl_2$ (d) $H_2SO_4$

6. Polarization is the distortion of the shape of an anion by an adjacently placed cation. Which of the following statements is correct
   (a) Maximum polarization is brought about by a cation of high charge
   (b) Minimum polarization is brought about by a cation of low radius
   (c) A large cation is likely to bring about a large degree of polarization
   (d) A small anion is likely to undergo a large degree of polarization

7. The bonds between $P$ atoms and $Cl$ atoms in $PCl_5$ are likely to be
   (a) Ionic with no covalent character
   (b) Covalent with some ionic character
   (c) Covalent with no ionic character
   (d) Ionic with some metallic character

8. Two electrons of one atom *A* and two electrons of another atom *B* are utilized to form a compound *AB*. This is an example of
   (a) Polar covalent bond

(b) Non-polar covalent bond
(c) Polar bond
(d) Dative bond

**9.** In which of the following molecule is the covalent bond most polar
(a) $HI$ (b) $HBr$
(c) $HCl$ (d) $H_2$

**10.** Amongst $ClF_3, BF_3$ and $NH_3$ molecules the one with non-planar geometry is
(a) $ClF_3$
(b) $NH_3$
(c) $BF_3$
(d) None of these

**11.** Which of the following possesses highest melting point
(a) Chlorobenzene
(b) *o*-dichlorobenzene
(c) *m*-dichlorobenzene
(d) *p*-dichlorobenzene

**12.** The polar molecule among the following is
(a) $CCl_4$ (b) $CO_2$
(c) $CH_2Cl_2$ (d) $CH_2 = CH_2$

**13.** Which of the following have both polar and non-polar bonds
(a) $C_2H_6$ (b) $NH_4Cl$
(c) $HCl$ (d) $AlCl_3$

**14.** Which of the following has a high polarising power
(a) $Mg^{2+}$ (b) $Al^{3+}$
(c) $Na^+$ (d) $Ca^{2+}$

**15.** Maximum covalent character is associated with the compound
(a) $NaI$ (b) $MgI_2$
(c) $AlCl_3$ (d) $AlI_3$

**16.** Polarisibility of halide ions increases in the order
(a) $F^-, I^-, Br^-, Cl^-$
(b) $Cl^-, Br^-, I^-, F^-$
(c) $I^-, Br^-, Cl^-, F^-$
(d) $F^-, Cl^-, Br^-, I^-$

**17.** According to Fajan's rule, covalent bond is favoured by
(a) Large cation and small anion
(b) Large cation and large anion
(c) Small cation and large anion
(d) Small cation and small anion

**18.** Which of the following statements is correct
(a) $SF_4$is polar and non-reactive
(b) $SF_6$is non-polar and very reactive
(c) $SF_6$is a strong fluorinating agent

(d) $SF_4$ is prepared by fluorinating $SCl_2$with $NaF$

**19.** Choose the correct statement

(a) Amino polarisation is more pronounced by highly charged cation

(b) Small cation has minimum capacity to polarise an anion.

(c) Small anion has maximum polarizability

(d) None of these

**20.** The $ICl$ molecule is

(a) Purely electrovalent

(b) Purely covalent

(c) Polar with negative end on iodine

(d) Polar with negative end on chlorine

**21.** Which of the following is a polar compound

(a) *HF* (b) *HCl*

(c) $HNO_3$ (d) $H_2SO_4$

**22.** Which of the following has zero dipole moment

(a) *ClF* (b) $PCl_3$

(c) $SiF_4$ (d) $CFCl_3$

**23.** Which of the following compounds has least dipole moment

(a) $PH_3$ (b) $CHCl_3$

(c) $NH_3$ (d) $BF_3$

**24.** Pauling's electronegativity values for elements are useful in predicting

(a) Polarity of bonds in molecules

(b) Position of elements in electrochemical series

(c) Co-ordination number

(d) Dipole moment of various molecules

**25.** Amongst *LiCl*, *RbCl*, $BeCl_2$ and $MgCl_2$ the compounds with the greatest and the least ionic character, respectively, are

(a) *LiCl* and *RbCl*

(b) *RbCl* and $BeCl_2$

(c) *RbCl* and $MgCl_2$

(d) $MgCl_2$ and $BeCl_2$

**26.** Bond polarity of diatomic molecule is because of

(a) Difference in electron affinities of the two atoms

(b) Difference in electronegativities of the two atoms

(c) Difference in ionisation potential

(d) All of these