Hydrogen bonding

1. In the following which bond will be responsible for maximun value of hydrogen bond
   (a) $O-H$ (b) $N-H$
   (c) $S-H$ (d) $F-H$

2. In which of the following hydrogen bond is present
   (a) H_2 (b) Ice
   (c) Sulphur (d) Hydrocarbon

3. In the following which has highest boiling point
   (a) HI (b) HF
   (c) HBr (d) HCl

4. Which contains hydrogen bond
   (a) HF (b) HCl
   (c) HBr (d) HI

5. Contrary to other hydrogen halides, hydrogen fluoride is a liquid because
   (a) Size of Fatom is small
   (b) $HF$is a weak acid
   (c) HFmolecule are hydrogen bonded
   (d) Fluorine is highly reactive

6. In the following which species does not contain sp^3 hybridization
   (a) SO_4^{2-} (b) CH_4
   (c) H_2O (d) CO_2

7. As a result of sp hybridization, we get
   (a) Two mutual perpendicular orbitals
   (b) Two orbitals at 180^o
   (c) Four orbitals in tetrahedral directions
   (d) Three orbitals in the same plane

8. The reason for exceptionally high boiling point of water is
   (a) Its high specific heat
   (b) Its high dielectric constant
   (c) Low ionization of water molecules
   (d) Hydrogen bonding in the molecules of water

9. Which concept best explains that *o*-nitrophenol is more volatile than *p*-nitrophenol
   (a) Resonance
   (b) Hyperconjugation
   (c) Hydrogen bonding
   (d) Steric hindrence

10. Which contains strongest H –bond
    (a) $O-H.....S$ (b) $S-H.....O$
    (c) $F-H.....F$ (d) $S-H.....O$

11. Which of the following compound can form hydrogen bonds

(a) CH_4 (b) $NaCl$

(c) $CHCl_3$ (d) H_2O

12. Of the following hydrides which has the lowest boiling point

(a) NH_3 (b) PH_3

(c) SbH_3 (d) AsH_3

13. The pairs of bases in DNA are held together by

(a) Hydrogen bonds

(b) Ionic bonds

(c) Phosphate groups

(d) Deoxyribose groups

14. Water has high heat of vaporisation due to

(a) Covalent bonding

(b) H –bonding

(c) Ionic bonding

(d) None of the above

15. In which of the following compounds does hydrogen bonding occur

(a) SiH_4 (b) LiH

(c) HI (d) NH_3

16. Which among the following compounds does not show hydrogen bonding

(a) Chloroform

(b) Ethyl alcohol

(c) Acetic acid

(d) Ethyl ether

17. Acetic acid exists as dimer in benzene due to

(a) Condensation reaction

(b) Hydrogen bonding

(c) Presence of carboxyl group

(d) Presence of hydrogen atom at α –carbon

18. Which one among the following does not have the hydrogen bond

(a) Phenol

(b) Liquid NH_3

(c) Water

(d) Liquid HCl

19. The bond that determines the secondary structure of a protein is

(a) Coordinate bond

(b) Covalent bond

(c) Hydrogen bond

(d) Ionic bond

20. HCl is a gas but HF is a low boiling liquid. This is because

(a) $H-F$ bond is strong

(b) $H-F$ bond is weak

(c) Molecules aggregate because of hydrogen bonding

(d) HF is a weak acid