Acids and Bases

1. Which of the following is not a Lewis acid
(a) CO (b) $SiCl_4$
(c) SO_3 (d) Zn^{2+}

2. Review the equilibrium and choose the correct statement $HClO_4 + H_2O \rightleftarrows H_3O^+ + ClO_4^-$
(a) $HClO_4$ is the conjugate acid of H_2O
(b) H_3O^+ is the conjugate base of H_2O
(c) H_2O is the conjugate acid of H_3O^+
(d) ClO_4^- is the conjugate base of $HClO_4$

3. A solution of $FeCl_3$ in water acts as acidic due to
(a) Hydrolysis of Fe^{3+}
(b) Acidic impurities
(c) Dissociation
(d) Ionisation

4. A white substance having alkaline nature in solution is
(a) $NaNO_3$ (b) NH_4Cl
(c) Na_2CO_3 (d) Fe_2O_3

5. Which of the following can act both as Bronsted acid and Bronsted base
(a) Cl^- (b) HCO_3^-
(c) H_3O^+ (d) OH^-

6. Lewis acid
(a) Presence of *H* atom is necessary
(b) Is a electron pair donor
(c) Always a proton donor
(d) Is a electron pair acceptor

7. For two acids *A* and *B*, $pK_a = 1.2, pK_b = 2.8$ respectively in value, then which is true
(b) *A* is stronger than *B*
(c) *B* is stronger than *A*
(d) Neither *A* nor *B* is strong
(e) None of these

8. Aq. solution of sodium cyanide is
(a) Acidic
(b) Amphoteric
(c) Basic
(d) Netural

9. Which of the following is the strongest conjugate base
(a) Cl^- (b) CH_3COO^-
(c) SO_4^{--} (d) NO_2^-

10. $NaOH$ is a strong base because
(a) It gives OH^-ion
(b) It can be oxidised
(c) It can be easily ionised
(d) Both (a) and (c)

11. Which one of the following can be classified as a Bronsted base
(a) NO_3^- (b) H_3O^+
(c) NH_4^+ (d) CH_3COOH

12. Which one of the following substance has the highest proton affinity
(a) H_2O (b) H_2S
(c) NH_3 (d) PH_3

13. Which of the following is the strongest Lewis acid
(a) BI_3 (b) BBr_3
(c) BCl_3 (d BF_3

14. An aqueous solution of ammonia consists of
(a) H^+
(b) OH^-
(c) NH_4^+
(d) NH_4^+ and OH^-

15. Which of the following is not a Lewis acid
(a) BF_3 (b) $FeCl_3$
(c) SiF_4 (d) C_2H_4

16. The conjugate base of NH_2^- is
(a) NH_3 (b) NH^{2-}
(c) NH_4^+ (d) N_3^-

17. The strength of an acid depends on its tendency to
(a) Accept protons
(b) Donate protons
(c) Accept electrons
(d) Donate electrons

18. Which is not a electrophile
(a) $AlCl_3$ (b) BF_3
(c) $(CH_3)_3C^+$ (d) NH_3

19. Ammonia gas dissolves in water to give NH_4OH. In this reaction water acts as
(a) An acid
(b) A base
(c) A salt
(d) A conjugate base

20. In the equilibrium
$CH_3COOH + HF \rightleftarrows CH_3COOH_2^+ + F^-$
(a) F^- is the conjugate acid of CH_3COOH
(b) F^- is the conjugate base of HF
(c) CH_3COOH is the conjugate acid of $CH_3COOH_2^+$
(d) $CH_3COOH_2^+$ is the conjugate base of CH_3COOH