Hydrogen ion concentration- *p*H scale and Buffer solution

1. The pH of blood does not appreciably change by a small addition of an acid or a base because blood
   (a) Contains serum protein which acts as buffer
   (b) Contains iron as a part of the molecule
   (c) Can be easily coagulated
   (d) It is body fluid

2. The pH of a $0.001 MNaOH$ will be
   (a) 3 (b) 2
   (c) 11 (d) 12

3. *pH* value of a solution, whose hydronium ion concentration is $6.2 \times 10^{-9} mol \rightleftarrows / \rightleftarrows l$, is
   (a) 6.21 (b) 7.21
   (c) 7.75 (d) 8.21

4. 0.1 mole of CH_3NH_2 ($K_b = 5 \times 10^{-4}$) is mixed with 0.08 mole of *HCl* and diluted to one litre. What will be the H^+ concentration in the solution?
   (a) 8×10^{-2} *M*
   (b) 8×10^{-11} *M*
   (c) 1.6×10^{-11} *M*
   (d) 8×10^{-5} *M*

5. What will be the sum of $pH$and pOH in an aqueous solution ?
   (a) 7 (b) pk_w
   (c) Zero (d) 1

6. Hydrogen ion concentration in *mol/L* in a solution of $pH = 5.4$ will be
   (a) 3.98×10^{8}
   (b) 3.88×10^{6}
   (c) 3.68×10^{-6}
   (d) 3.98×10^{-6}

7. When solid potassium cyanide is added in water then
   (a) *pH* will increase
   (b) *pH* will decrease
   (c) *pH* will remain the same
   (d) Electrical conductivity will not change

8. *pH* of a $10^{-3}M$ solution of hydrochloric acid will be
   (a) 1.3 (b) 2.0
   (c) 3.0 (d) 4.5

9. The $pH$of water at 25^oC is nearly
   (a) 2 (b) 7
   (c) 10 (d) 12

10. pH of a solution is 5. Its hydroxyl ion concentration is
    (a) 5 (b) 10
    (c) 10^{-5} (d) 10^{-9}

11. The pH of a solution in which the $[H^+] = 0.01$, is
    (a) 2 (b) 1
    (c) 4 (d) 3

12. At 25°*C*, the dissociation constant of a base *BOH* is 1.0×10^{-12}. The concentration of Hydroxyl ions in 0.01 *M* aqueous solution of the base would be

(a) $2.0 \times 10^{-6} molL^{-1}$

(b) $1.0 \times 10^{-5} mol\ L^{-1}$

(c) $1.0 \times 10^{-6} molL^{-1}$

(d) $1.0 \times 10^{-7} mol \rightleftarrows L^{-1}$

13. Aqueous solution of HCl has the $pH = 4$. Its molarity would be

(a) 4 *M* (b) 0.4 *M*

(c) 0.0001 *M* (d) 10 *M*

14. Which is a buffer solution

(a) $CH_3COOH + CH_3COONa$

(b) $CH_3COOH + CH_3COONH_4$

(c) $CH_3COOH + NH_4Cl$

(d) $NaOH + NaCl$

15. The addition of solid sodium carbonate to pure water causes

(a) An increase in hydronium ion concentration

(b) An increase in alkalinity

(c) No change in acidity

(d) A decrease in hydroxide ion concentration

16. The aqueous solution of which of the following salt has the lowest *pH*

(a) $NaClO$ (b) $NaClO_2$

(c) $NaClO_3$ (d) $NaClO_4$

17. The pH of a $10^{-10} MNaOH$ solution is nearest to

(a) 10 (b) 7

(c) 4 (d) -10

18. Which will have maximum pH

(a) Distilled water

(b) $1MNH_3$

(c) $1MNaOH$

(d) Water saturated by chlorine

19. *pH* of a solution is 9.5. The solution is

(a) Neutral (b) Acidic

(c) Basic (d) Amphoteric

20. The pH of a $10^{-9} M$ solution of HCl in water is

(a) 8

(b) – 8

(c) Between 7 and 8

(d) Between 6 and 7