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

21. $pH + pOH$ equal to
(a) Zero (b) Fourteen
(c) A negative number (d) Infinity'

22. Which of the following 0.1*M* solution will contain the largest concentration of hydronium ions
(a) $NaHCO_3$ (b) NH_4Cl
(c) HCl (d) NH_3

23. Which one has pH 12
(a) $0.01MKOH$
(b) $1NKOHml$
(c) $1NNaOHml$
(d) $3.0 \times 10^{-7}M$

24. What is the correct relationship between the pHs of isomolar solutions of sodium oxide (pH_1), sodium sulphide (pH_2), sodium selenide (pH_3) and sodium telluride (pH_4)?
(a) $pH_1 > pH_2 = pH_3 > pH_4$
(b) $pH_1 < pH_2 < pH_3 < pH_4$
(c) $pH_1 < pH_2 < pH_3 = pH_4$
(d) $pH_1 > pH_2 > pH_3 > pH_4$

25. Given *pH* of a solution *A* is 3 and it is mixed with another solution *B* having *pH* 2. If both mixed then resultant *pH* of the solution will be
(a) 3.2 (b) 1.9
(c) 3.4 (d) 3.5

26. On adding solid potassium cyanide to water
(a) *pH* will increase
(b) *pH* will decrease
(c) *pH* will not change
(d) Electrical conductance will not change

27. *A* is an aqueous acid; *B* is an aqueous base. They are diluted separately, then
(a) pH of *A* increases and pH of *B* decreases
(b) pH of *A* increases and pH of *B* decreases till pH in each case is 7
(c) pH of *A* and *B* increase
(d) pH of *B* and *A* decrease

28. The compound whose 0.1 *M* solution is basic is
(a) Ammonium acetate
(b) Calcium carbonate
(c) Ammonium sulphate
(d) Sodium acetate

29. The following reaction is known to occur in the body $CO_2 + H_2O \rightleftharpoons H_2CO_3 \rightleftharpoons H^+ + HCO_3^-$. If CO_2 escapes from the system
(a) pH will decrease

(b) Hydrogen ion concentration will decrease
(c) H_2CO_3 concentration will be unaltered
(d) The forward reaction will be promoted

30. For preparing a buffer solution of $pH6$ by mixing sodium acetate and acetic acid, the ratio of the concentration of salt and acid should be$(K_a = 10^{-5})$
(a) $1:10$ (b) $10:1$
(c) $100:1$ (d) $1:100$

31. Which is incorrect for buffer solution
(a) It contains weak acid and its conjugate base
(b) It contains weak base and its conjugate acid
(c) In this there is very less change is pH value when very less amount of acid and base is mixed
(d) None of the above

32. pH values of HCl and $NaOH$ solutions each of strength $\frac{N}{100}$ will be respectively
(a) 2 and 2 (b) 2 and 12
(c) 12 and 2 (d) 2 and 10

33. When rain is accompained by a thunderstorm, the collected rain water will have a *pH* value
(a) Slightly lower than that of rain water without thunderstorm
(b) Slightly higher than that when the thunderstorm is not there
(c) Uninfluenced by occurrence of thunderstorm
(d) Which depends on the amount of dust in air

34. Which of the following is the buffer solution of strong acidic nature
(a) $HCOOH + HCOO^-$
(b) $CH_3COOH + CH_3COO^-$
(c) $H_2C_2O_4 + C_2O_4^{2-}$
(d) $H_3BO_3 + BO_3^{3-}$

35. The dissociation constant of an acid *HA* is 1×10^{-5}. The pH of 0.1 molar solution of the acid will be
(a) Five (b) Four
(c) Three (d) One

36. The *pH* value of $1.0 \times 10^{-8} MHCl$ solution is less than 8 because
(a) HCl is completely ionised at this concentration
(b) The ionization of water is negligible
(c) The ionization of water cannot be assumed to be negligible in

comparison with this low concentration of HCl

(d) The *pH* cannot be calculated at such a low concentration of HCl

37. What is the *pH* for a neutral solutions at the normal temperature of the human body

(a) 7.2 (b) 14.0

(c) 6.8 (d) 6.0

38. 1 *M* $NaCl$ and 1 *M* HCl are present in an aqueous solution. The solution is

(a) Not a buffer solution with *pH* < 7

(b) Not a buffer solution with *pH* > 7

(c) A buffer solution with *pH* < 7

(d) A buffer solution with *pH* > 7

39. A solution has $pH = 5$, it is diluted 100 times, then it will become

(a) Neutral

(b) Basic

(c) Unaffected

(d) More acidic

40. 0.02 *M* monobasic acid dissociates 2% hence, pH of the solution is

(a) 0.3979 (b) 1.3979

(c) 1.699 (d) 3.3979