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

41. Components of buffer solution are $0.1MHCN$ and $0.2MNaCN$. What is the *pH* of the solution

(a) 9.61 (b) 6.15
(c) 2.0 (d) 4.2

42. *pH* of a solution of $10ml$. 1*N* sodium acetate and $50ml$ 2*N* acetic acid $(K_a = 1.8 \times 10^{-5})$, is approximately

(a) 4 (b) 5
(c) 6 (d) 7

43. By adding $20ml$ $0.1NHCl$ to $20ml$ $0.001N$ KOH, the *pH* of the obtained solution will be

(a) 2 (b) 1.3
(c) 0 (d) 7

44. The *pH* of the solution containing $10ml$ of a $0.1NNaOH$ and $10ml$ of $0.05N$ H_2SO_4 would be

(a) 1 (b) 0
(c) 7 (d) > 7

45. The pH of $10^{-7}MNaOH$ is

(a) 7.01
(b) Between 7 and 8
(c) Between 9 and 10
(d) Greater than 10

46. The hydrogen ion concentration of $0.1N$ solution of CH_3COOH, which is 30% dissociated, is

(a) 0.03 (b) 3.0
(c) 0.3 (d) 30.0

47. What is the *pH* of $0.1MNH_3$

(a) 11.27 (b) 11.13
(c) 12.0 (d) 9.13

48. By adding a strong acid to the buffer solution, the *pH* of the buffer solution

(a) Remains constant
(b) Increases
(c) Decreases
(d) Becomes zero

49. The *pH* of $0.1MNaOH$ is

(a) 11 (b) 12
(c) 13 (d) 14

50. *pH* of human blood is 7.4. Then H^+ concentration will be

(a) 4×10^{-8} (b) 2×10^{-8}
(c) 4×10^{-4} (d) 2×10^{-4}

51. Assuming complete ionisation, the *pH* of $0.1MHCl$, is 1. The molarity of H_2SO_4 with the same *pH* is

(a) 0.1 (b) 0.2
(c) 0.05 (d) 2.0

52. Highest *pH* 14 is given by

(a) $0.1MH_2SO_4$

(b) $0.1MNaOH$
(c) $1NNaOH$
(d) $1NHCl$

53. What will be the pH of a $10^{-8}MHCl$ solution
(a) 8.0 (b) 7.0
(c) 6.98 (d) 14.0

54. When 10 *ml* of 0.1 *M* acetic acid $(pK_a = 5.0)$ is titrated against 10 *ml* of 0.1*M* ammonia solution $(pK_b = 5.0)$, the equivalence point occurs at *pH*
(a) 5.0 (b) 6.0
(c) 7.0 (d) 9.0

55. Which on reaction with water will have pH less than 7
(a) BaO (b) CaO
(c) Na_2O (d) P_2O_5

56. A solution of $MgCl_2$ in water has *pH*
(a) < 7 (b) > 7
(c) 7 (d) 14.2

57. *pH* of completely dissociated $0.005MH_2SO_4$ is
(a) 3 (b) 4
(c) 2 (d) 5

58. The pK_a of a weak acid is 4.8. What should be the ratio of [Acid]/[Salt] of a buffer if $pH = 5.8$ is required
(a) 10 (b) 0.1
(c) 1 (d) 2

59. Which of the following salt is acidic
(a) Na_2SO_4 (b) $NaHSO_3$
(c) Na_2SO_3 (d) Na_2S

60. $20ml$ of $0.5NHCl$ and $35ml$ of $0.1NNaOH$ are mixed. The resulting solution will
(a) Be neutral
(b) Be basic
(c) Turn phenolphthalein solution pink
(d) Turn methyl orange red