Yakeen NEET 2.0 2026

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DPP: 5

Ionic Equilibrium

Q1 In a mixture of a weak acid and its salt, the ratio of concentration of acid to salt is increased ten-fold. The pH of the solution;
(A) Decreases by one
(B) Increases by one-tenth
(C) Increases by one
(D) Increases ten-fold

Q2 How many moles of HCOONa must be added to $1\ \mathrm{L}$ of $0.1\mathrm{M}\mathrm{HCOOH}$ to prepare a buffer solution with a pH of 3.4? (Given: $\mathrm{K_a}$ for $\mathrm{HCOOH} = 2 \times 10^{-4}$)
(A) 0.01 (B) 0.05
(C) 0.1 (D) 0.2

Q3 To $1.0\ \mathrm{L}$ solution containing $0.1\ \mathrm{mol}$ each of $\mathrm{NH_3}$ and $\mathrm{NH_4Cl}, 0.05\ \mathrm{mol}\mathrm{HCl}$ is added. The change in pOH will be $(\mathrm{pK_b}$ for $\mathrm{NH_3} = 4.74)$
(A) 0.30 (B) -0.30
(C) 0.48 (D) -0.48

Q4 The pH of blood is maintained by the balance between $\mathrm{H_2CO_3}$ and $\mathrm{NaHCO_3}$ If the amount of $\mathrm{CO_2}$ in the blood is increased, how will it effect the pH of blood?
(A) pH will remain same
(B) pH will be 7
(C) pH will increase
(D) pH will decrease

Q5 The pH of buffer of $\mathrm{NH_4OH} + \mathrm{NH_4Cl}$ - type is given by
(A) $\mathrm{pH} = \mathrm{pK_b}$
(B) $\mathrm{pH} = 1/2\mathrm{pK_b} - 1/2\log[\text{ salt }]/[\text{ base }]$
(C) $\mathrm{pH} = 14 - \mathrm{pK_b} - \log[\text{ salt }]/[\text{ base }]$
(D) $\mathrm{pH} = \mathrm{pOH} - \mathrm{pKK_b} + [\text{ salt }]/[\text{ base }]$

Q6 Addition of sodium acetate solution to acetic acid causes the following change
(A) pH increases
(B) pH decreases
(C) pH remains unchanged
(D) pH becomes 7

Q7 In a buffer solution of a weak acid and its salt, if the ratio of concentration of salt to acid is raised 10 times then pH of the solution will
(A) Increase ten times
(B) Decrease by one unit
(C) Decrease ten times
(D) Increase by one unit

Q8 For preparing a buffer solution of pH 6 by mixing sodium acetate and acetic acid, the ratio of the concentration of salt and acid should be $\left(\mathrm{K_a} = 10^{-5}\right)$
(A) $1:10$ (B) $10:1$
(C) $100:1$ (D) $1:100$

Q9 Which of the following pairs constitutes a buffer?
(A) $\mathrm{HNO_2}$ and $\mathrm{NaNO_2}$
(B) NaOH and NaCl
(C) $\mathrm{HNO_3}$ and $\mathrm{NH_4NO_3}$
(D) HCl and KCl

Q10 0.1 mole of $\mathrm{CH_3NH_2}$ $\left(\mathrm{K_b} = 5 \times 10^{-4}\right)$ is mixed with 0.08 mole of HCl and the solution diluted to one litre. The $\mathrm{H^+}$ ion concentration in the solution will be

(A) 1.6×10^{-11}

(B) 8×10^{-11}

(C) 5×10^{-5}

(D) 8×10^{-2}

Q11 Two buffer solutions, A and B, each made with acetic acid and sodium acetate differ in their pH by one unit, A has salt: acid $= \mathrm{x} : \mathrm{y}, \mathrm{B}$ has salt: acid $= y : x$ If $x > y$, then the value of $x : y$ is

(A) 10,000 (B) 3.17

(C) 6.61 (D) 2.10

Q12 Which of the following mixtures is/are buffer?

(A) $10ml\ 0.1M\ NH_4Cl + 10ml\ 0.08M\ NaOH$

(B) $20\ ml\ 0.22M\ CH_3COOH + 30ml\ 0.18M\ NaOH$

(C) $25ml\ 0.22M\ H_2SO_4 + 25ml\ 0.15M\ NaOH$

(D) $15ml\ 0.12M\ CH_3NH_2 + 10ml\ 0.12M\ HCl$

Answer Key

Q1	(A)
Q2	(B)
Q3	(C)
Q4	(A)
Q5	(C)
Q6	(A)
Q7	(D)
Q8	(B)
Q9	(A)
Q10	(B)
Q11	(B)
Q12	(D)