Arjuna NEET 2.0 2026

Physical Chemistry

Equilibrium

DPP: 8

Q1 pH of a solution can be expressed as
(A) $-\log_e\left[\mathrm{H}^+\right]$
(B) $-\log_{10}\left[\mathrm{H}^+\right]$
(C) $\log_e\left[\mathrm{H}^+\right]$
(D) $\log_{10}\left[\mathrm{H}^+\right]$

Q2 The hydrogen ion concentration of the oceans is about $2 \times 10^{-9}\mathrm{M}$. What is the pH ?
(A) 8.85 (B) 9.3
(C) 7.85 (D) 8.7

Q3 The $\left[\mathrm{H}^+\right]$ of a solution is $0.03\mathrm{M}$. The pOH of this solution is,
(A) 12.48 (B) 12.52
(C) 12.54 (D) 12.58

Q4 For a $100\mathrm{ml}$ solution of $10^{-2}\mathrm{MNaOH}$ the ratio $\mathrm{pH}:\mathrm{pOH}$ would be
(A) $6:1$
(B) $1:6$
(C) $2:1$
(D) $10^{10}:1$

Q5 pH of solution is 4 . The hydroxide ion concentration of the solution would be
(A) 10^{-4} (B) 10^{-10}
(C) 10^{-2} (D) 10^{-12}

Q6 An alcoholic drink substance has $\mathrm{pH}=4.7$ then OH^- ion concentration of this solution is $K_{\mathrm{w}}=10^{-14}\ \mathrm{mol}^2\ \mathrm{L}^{-2}$
(A) 3×10^{-10}
(B) 5×10^{-10}
(C) 1×10^{-10}
(D) 5×10^{-8}

Q7 At any temperature for a neutral solution:
(A) $\mathrm{pH}>\mathrm{pOH}$
(B) $\mathrm{pH}=\mathrm{pOH}=7$
(C) $\mathrm{pH}=\mathrm{pOH}$
(D) $\mathrm{pH}<\mathrm{pOH}$

Q8 The aqueous solution whose $\mathrm{pH}=0$ is
(A) Acidic (B) Alkaline
(C) Amphoteric (D) Neutral

Q9 At $25^{\circ}\mathrm{C}$, the $\left[\mathrm{H}^+\right]$ of a solution is $2 \times 10^{-9}\mathrm{M}$. The nature of the solution is:
(A) Neutral
(B) Acidic
(C) Basic
(D) Can not be predicted

Q10 The pH value of pure water at $300K$ is
(A) exactly 7
(B) slightly >7
(C) zero
(D) slightly <7

Q11 Ostwalds dilution law gives satisfactory results with the solution of the electrolyte
(A) HCl
(B) $\mathrm{HNO_3}$
(C) $\mathrm{CH_3COOH}$
(D) NaOH

Q12 For a weak acid HA, Ostwalds dilution law is represented by the equation
(A) $\mathrm{K_a}=\frac{\alpha \mathrm{C}}{1-\alpha^2}$
(B) $\mathrm{K_a}=\frac{\alpha^2 \mathrm{C}}{1-\alpha}$
(C) $\alpha=\frac{\mathrm{KaC}}{1-\mathrm{C}}$
(D) $K_a=\frac{\alpha^2 \mathrm{C}}{1-\alpha^2}$

Q13 The extent of ionization increases
(A) With the increase in concentration of solute
(B) On addition of excess water to solution
(C) On decreasing the temperature of solution
(D) On stirring the solution vigorously

Q14 Ostwalds dilution law is applicable in the case of the solution of:
(A) CH_3COOH
(B) $NaCl$
(C) $NaOH$
(D) H_2SO_4

Q15 Extent of ionisation depends upon:
(A) Pressure (B) Volume
(C) Dilution (D) None of these

Q16 At infinite dilution, the percentage ionisation for both strong and weak electrolytes is
(A) 1% (B) 20%
(C) 50% (D) 100%

Q17 If α is the degree of ionization, C the concentration of a weak electrolyte and K_a the acid ionization constant, then the correct relationship between α, C and K_a is
(A) $\alpha^2 = \sqrt{\frac{K_a}{C}}$
(B) $\alpha^2 = \sqrt{\frac{C}{K_a}}$
(C) $\alpha = \sqrt{\frac{K_a}{C}}$
(D) $\alpha = \sqrt{\frac{C}{K_a}}$

Q18 Which of the concentrations has the largest degree of dissociation for a weak acid?
(A) $1.0M$
(B) $0.5M$
(C) $0.10M$
(D) $0.01M$

Q19 The pH of a $0.1M$ aqueous solution of a weak acid (HA) is 3 . What is its degree of dissociation?
(A) 1% (B) 10%
(C) 50% (D) 25%

Q20 Concentration CN^- in 0.1M HCN is:
[$K_a = 4 \times 10^{-10}$]
(A) $2.5 \times 10^{-6}M$
(B) $4.5 \times 10^{-6}M$
(C) $6.3 \times 10^{-6}M$
(D) $9.2 \times 10^{-6}M$

Q21 A monoprotic acid in a $0.1M$ solution ionizes to 0.001%. Its ionisation constant is:
(A) 1.0×10^{-3}
(B) 1.0×10^{-6}
(C) 1.0×10^{-8}
(D) 1.0×10^{-11}

Q22 Find the percentage ionisation of $0.2M$ acetic acid solution, whose dissociation constant is 1.8×10^{-5}
(A) 0.198 (B) 0.290
(C) 0.950 (D) None

Q23 Degree of dissociation of $0.1\ NCH_3COOH$ is: (Dissociation constant $= 1 \times 10^{-5}$)
(A) 10^{-5} (B) 10^{-4}
(C) 10^{-3} (D) 10^{-2}

Q24 A weak acid HA has a K_a of 1.00×10^{-5}. If 0.100 mole of this acid is dissolved in one litre of water, the percentage of acid dissociated at equilibrium is closed to:
(A) 99.0% (B) 1.00%
(C) 99.9% (D) 0.100%

Q25 A monoprotic acid in $0.1M$ solution has $K_a = 1.0 \times 10^{-5}$. The degree of dissociation for acid is
(A) 1.0% (B) 99.9%
(C) 0.1% (D) 99%

Answer Key

Q1	(B)
Q2	(D)
Q3	(A)
Q4	(A)
Q5	(B)
Q6	(B)
Q7	(C)
Q8	(A)
Q9	(B)
Q10	(D)
Q11	(C)
Q12	(B)
Q13	(B)
Q14	(A)
Q15	(C)
Q16	(D)
Q17	(C)
Q18	(D)
Q19	(A)
Q20	(C)
Q21	(D)
Q22	(C)
Q23	(D)
Q24	(B)
Q25	(A)