Exercise-I

A. Very Short Answer Type Questions

Q.1 What is the nature of the solution which turns blue litmus to red ?

Q.2 Conjugate acid-base pair differ by

Q.3 A substance gives H_3O^+ ions in aqueous solution. What is that substance ?

Q.4 The conjugate base of a strong acid

Q.5 In a reaction H^+ ions combine with OH^- ions to form water. What is the type of reaction ?

Q.6 Arrhenius theory of acids-bases is not applicable to

Q.7 What is the conjugate base of CH_3OH ?

Q.8 What is the conjugate acid of CH_3COOH ?

Q.9 Write conjugate base of HCN

Q.10 Write conjugate base of HN_3

Q.11 In the Bronsted-Lowry system a base is defined as.

Q.12 In the following system
$CN^- + H_2O \rightleftharpoons HCN + OH^-$ the conjugate acid-base pairs are.

Q.13 What is the nature of the solution which turns red litmus to blue ?

Q.14 Give one example of Bronsted-Lowry acid.

Q.15 Give one example of Amphoteric compound

B. Short Answer Type Questions

Q.16 Find the pH value of the solution when its H^+ ion concentration is
(a) 10^{-4} mol L^{-1}
(b) 10^{-7} mol L^{-1}

Q.17 Discuss Arrhenius theory of acids and bases taking the example of NaOH and NH_4OH.

Q.18 What is the pH of a solution when the hydrogen ion concentration is 1×10^{-10} ?

Q.19 Calculate the pH of solution containing concentration of hydroxyl ions as 1×10^{-11}.

Q.20 (i) Find out the pH of 0.05 M H_2SO_4.
(ii) Find out the pH of H^+ ion concentration $= 3\times 10^{-3}$.

Q.21 What is the pH range ?

Q.22 If pH is equal to 7, what kind of solution is indicated ?

Q.23 Define and give one example of Bronsted–Lowry base ?

Q.24 Define the term of Neutralisation.

Q.25 What is the Arrhenius theory of acids and bases ? Give its two important limitations.

Q.26 Describe the Bronsted-Lowry concept of acids and bases. What are the conjugate acid base pairs according to the concept ?

Q.27 Explain giving reasons.
(i) Water behaves as an acid and also like a base on the basis of protonic concept ?

Q.28 Find the conjugate acid/base for the following species:
HNO_2, $HClO_4$, OH^-, CO_3^{-2}, S^{-2}

C. Long Answer Type Questions

Q.29 Define the term acid and base on the basis of Arrhenius concept.

Q.30 What are strong and weak electrolytes ? Explain with suitable examples.

Q.31 Define pH. What is pH-scale ?

Exercise-II

A. Fill in the Blanks

Q.1 According to Arrhenius acid-base theory, in neutralisation reaction..... molecule is formed.

Q.2 The conjugate acid of HPO_3^{2-} is.....

Q.3 The conjugate base of NH_3 is.....

Q.4 A conjugate acid forms a conjugate base by..... of a proton.

Q.5 A strong base would have a..... Conjugate acid.

Q.6 The conjugate acid of O^{2-} ion is.....

Q.7 ..... acid-base theory cannot define that NH_3 is a base.

Q.8 HSO_4^- is a conjugate acid of.....

Q.9 In the reaction I, HCO_3^- behaves as..... and in the reaction II HCO_3^- behaves as ..... hence, HCO_3^- is said to be.....

$HCO_3^- + H_2O \rightleftharpoons CO_3^{2-} + H_3O^+$ (I)

$HCO_3^- + H_2O \rightleftharpoons H_2CO_3 + OH^-$ (II)

Q.10 In the following reaction

$[Al(H_2O)_6]^{3+} + H_2O \rightleftharpoons [Al(H_2O)_5OH]^{2+} + H_3O^+$

$[Al(H_2O)_6]^{3+}$ is.....

Q.11 The pH of an acidic solution is..... than 7

Q.12 An acid produce..... ions when dissolved in water.

Q.13 A Base produce..... ions when dissolved in water.

Q.14 The pH of a basic solution is..... than 7

Q.15 The hydrogen ion concentration in pure water is.....

Q.16 pOH for a solution can be calculated by subtracting..... from 14.

B. True /False Type Questions

Q.17 A base turns blue litmus red.

Q.18 NH_4OH is a strong base.

Q.19 In pure water $[H_3O^+] = [OH^-]$.

Q.20 pH of acidic solutions ranges from 7 to 14.

Q.21 Arrhenius concept of acids and bases is based on theory of ionization.

Q.22 An acid turns blue litmus red

Q.23 pH of pure water is always 7

Q.24 NH_4^+ ion is Bronsted acid

Q.25 pH + pOH = 14 is valid at all temperatures

Q.26 pH of water increases with increase in temperature