Note:-
1. All Questions are compulsory.
2. Numbers on the right indicate full marks.

Section A

Q.1 Select and write the correct answer. (4)

1. Which of the following does not acts as Bronsted acid ?

   A) NH_4^+ B) HSO_3^-

   C) HCO_3^- D) CH_3COO^-

2. The conjugate base of $H_2PO_4^-$ is

   A) $PO4^{3-}$ B) HPO_4^{2-}

   C) H_3PO_4 D) P_2O_5

3. The molar solubility of AgBr if its solubility product, K_{sp} = 5.2 × 10^{-13} is

   A) 7.2 × 10^{-7} B) 1.35 × 10^{-4}

   C) 8.5 × 10^{-9} D) 2.35 × 10^{-15}

4. How many liters of water must be added to 1 litre of an aqueous solution of HCl with a pH of 1 to create an aqueous solution with pH of 2?

   A) 0.9 L   B) 2.0 L

   C) 9.0 L   D) 0.1 L

Q.2 Answer the following. (3)

1. Give an example each of strong electrolyte and weak electrolyte.

2. A monobasic acid is 0.050% ionized in its decimolar solution. Find the ionization constant of the acid.

3. Home made jams and jellies without any added chemical preservation additives spoil in a few days whereas commercial jams and jellies have a long shelf life. What role does added sodium benzoate play?

Section B
Attempt any Four

Q.3   Write the solubility equilibria for calcium phosphate and mercurous chloride. **(2)**

Q.4   What is meant by conjugate acid-base pair? **(2)**

Q.5   List the advantages of Lowry-Bronsted concept. **(2)**

Q.6   What is the need for the conceptual definition of acids and bases? **(2)**

Q.7   What are the characteristics of buffer solutions?   **(2)**

Q.8   The pH of solution is 5.85. Calculate its H^+ ion concentration.   **(2)**

Section C
Attempt any Two

Q.9   Give relation between pH and nature of the solution.   **(3)**

Q.10   The solution of NH_4F turns blue litmus red. Explain.   **(3)**

Q.11   Solubility product of AgCl is 1.8×10^{-10}. Calculate its molar solubility and solubility in g / L. (Molar mass of AgCl is 143.5 g mol^{-1})   **(3)**

Section D
Attempt any One

Q.12   Take two test tubes and label them as A and B. Add Zinc filings in both the test tubes. In the test tube labelled A add 5 mL of 1M HCl and in test B 5 mL of acetic acid. Keep the test tubes on the stand. Note down your observations.   **(4)**
(a) Do you see any effervescence coming from the two test tubes?
(b) Which gas is evolved?
(c) How do you identify the gas?
(d) What is the relative rate at which the gas is evolved in the two test tubes?
(e) Based on your observations comment on the strength of acids used.

Q.13   Calculate the pH of   (a) 4.2×10^{-6} M H_2SO_4 (b) 0.006 M NaOH   (c) 9.2×10^{-4} M HNO_3 **(4)**