# Step Academy official

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| STUDENT NAME | | | CLASS | New 1st Year (FSC/ICS) |
| PAPER CODE | 16073 | | SUBJECT | Chemistry |
| TIME ALLOWED | 40 | | TOTAL MARKS | 25 |
| Paper Date | 21-02-2026 | | Paper Type | |

**Q1.** **Choose the correct answer.** 5X1=5

**1.** Which of the following is the conjugate base of water?

**(A)** $OH^-_{(aq)}$ **(B)** $H^+_{(aq)}$ **(C)** $H_2O_{(l)}$ **(D)** $H_3O^+_{(aq)}$

**2.** In an acid-base titration, the equivalence point is reached when:

**(A)** pH of the solution is 7.0 **(B)** The indicator change color. **(C)** Equal volumes of acid and base have been added. **(D)** The reaction stops.

**3.** If the concentration of Cl-ion in a solution is increased, the solubility of silver chloride (AgCl) will:

**(A)** Decrease **(B)** Increase **(C)** Remain unchanged **(D)** Become zero

**4.** If the pH of a solution is 11, what is the $[OH^-]$ concentration in the solution?

**(A)** $1 \times 10^{-3}$ M **(B)** $1 \times 10^{-11}$ M **(C)** $1 \times 10^{-2}$ M **(D)** $1 \times 10^{-14}$ M

**5.** Which of the following pairs forms a buffer solution?

**(A)** HCl and NaCl **(B)** $CH_3COONa$ and $CH_3COOH$ **(C)** NaOH and HCl **(D)** $NH_3$ and $NaSO_4$

**Q2.** **Write short answers of the following questions.** 5X2=10

**1 .** What is Buffer capacity?

**2 .** Write some applications of Buffer solutions.

**3 .** Define the following with an example for each:(i) Ionization constant (ii) Solubility product

**4 .** How pH and pOH are related with each other?

**5 .** Why does common ion effect decrease solubility of a less soluble salt?

**Q3.** **Write detailed answers of the following questions.** 2X5=10

**1 .** Discuss applications and implications of the common ion effect in various fields.

**2 .**
A buffer solution has a pH of 5.0. It is made from a weak acid HA with a pKa of 4.8. What is the ratio of the concentration of the conjugate base $[A^-]$ to the concentration of the weak acid [HA] in this buffer?