

NAME:		ROLL NO:		TIME:	50: MIN
SUB:	Chemistry	Date:		CLASS:	1 st Year
SYLLABUS	Chp. 9 (Acid Base Chemistry)	T. MARKS	30	OBT. M	

Q. 1 Choose the Correct Answer. Cutting, Erasing, Double Selection is Strictly Prohibited. (1x6=6)

- Given the following reaction: $\text{NH}_3(\text{g}) + \text{H}_2\text{O}(\text{l}) \rightarrow \text{NH}_4^+(\text{aq}) + \text{OH}^-(\text{aq})$
 (A) NH_3 is the acid, H_2O is the base (B) NH_3 is the base, H_2O is the acid
 (C) NH_4^+ is the base, OH^- is the acid (D) H_2O is the base, OH^- is the acid
- In the given reaction, the conjugate base is: $\text{NH}_3 + \text{HCl} \rightarrow \text{NH}_4^+ + \text{Cl}^-$
 (A) NH_3 (B) Cl^- (C) NH_4^+ (D) HCl
- Which statement correctly describes a Lewis acid?
 (A) Accepts a lone pair of electrons (B) Donates a lone pair of electrons
 (C) Always donates protons (D) Has a negative charge
- If the pH of a solution is 11, what is the $[\text{OH}^-]$ concentration in the solution?
 (A) $1 \times 10^{-3} \text{ M}$ (B) $1 \times 10^{-11} \text{ M}$ (C) $1 \times 10^{-2} \text{ M}$ (D) $1 \times 10^{-14} \text{ M}$
- The solubility product of AgCl is $2.0 \times 10^{-10} \text{ mol dm}^{-3}$. The maximum concentration of Ag^+ ions in the solution is:
 (A) $2.0 \times 10^{-10} \text{ mol dm}^{-3}$ (B) $1.41 \times 10^{-5} \text{ mol dm}^{-3}$
 (C) $1 \times 10^{-10} \text{ mol dm}^{-3}$ (D) $4.0 \times 10^{-20} \text{ mol dm}^{-3}$
- Which indicator is typically used for titrations involving strong acids and strong bases?
 (A) Methyl red (B) Phenolphthalein (C) Bromothymol blue (D) Litmus solution

PART-I

Q. 2 Write Short Answers of the Following Questions (2x8=16)

- Identify the Lewis acid and Lewis base in the reaction between: (a) SO_3 and O^{2-} (b) HCl and H_2O
Also write down the balanced chemical equation for the reaction and explain.
- Calculate the pH of a 0.01 M NaOH solution.
- Determine $[\text{H}_3\text{O}^+]$ in a 0.01 M HA solution given $K_a = 1.0 \times 10^{-6}$.
- Define common ion effect. Give a suitable example.
- Differentiate end point and equivalent point.
- A solution is prepared by mixing equal volumes of two solutions: one with a pH of 4.0 and another with a pH of 10.0. Calculate the K_w for this mixture at 25°C .
- How does a buffer maintain pH stability?
- Why is aqueous solution of NH_4Cl slightly acidic?

PART-II

Write Answers of the Following Questions in Detail.

- Q. 3 (a) Describe the Bronsted-Lowry theory of acids and bases. Provide examples of conjugate acid-base pairs and explain clearly their relationship. 4
- (b) The molar solubility of silver chromate (Ag_2CrO_4) in pure water at 298 K is $6.5 \times 10^{-5} \text{ mol dm}^{-3}$. Calculate the K_{sp} of silver chromate at this temperature. 4



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1ST YEAR REVISION & TEST SESSION



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Answer Key

1	B	2	B	3	A	4	C
5	B	6	C				