The Times Secondary School
Dillibazar, Kathmandu
Second Unit Test – 2076

Grade: - XII   **Set – A**   Full Marks:- 25
Stream: Science   Pass Marks:-10
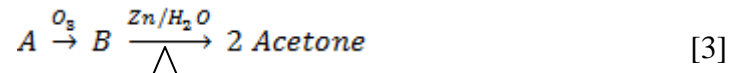Subject: - Chemistry   Time : 45Mins

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate the full marks

Attempt all questions.

1. State Ostwald's dilution law. Why P^H scale ranges from 0 to 14 only? Calculate the P^H of a solution obtained by mixing 50 ml of 0.1 M $Zn(OH)_2$ solution with 50 ml of water. [3]

2. What are ionization constant and degree of ionization of weak electrolyte? Calculate percentage dissociation of H_2S in a solution containing 0.2M in 500 ml of its solution ($K_{H2S} = 1.5 \times 10^{-7}$) [3]

3. What is salt bridge? Explain its important functions in electrochemical cell. What do you mean by standard electrode potentials ? write a relationship to convert one into another. [3]

OR

A cell is prepared by dipping Cu rod in 1M $CuSO_4$ and Ni rod in 1M $NiSO_4$ solution. The standard reduction potentials of Cu and Ni electrodes are 0.34V and 0.25V respectively.
   a. what will be the half cell reaction and overall cell reaction.
   b. how will the cell be represented.
   c. which electrode acts as carrier of current and calculate the EMF of cell. [3]

4. How would you convert the followings ? write necessary chemical reactions .
   a. Trichloroethanal into DDT
   b. Toluene into chlorobenzene
   c. Phenol into acetophenone. [3]

5. Give detailed chemistry about method of preparation of 1^0 , 2^0 and 3^0 alcohols using carbonyl compounds. How would you obtain ethanol from ethanamine? [3]

6. Write principal reaction for lab preparation of methanoic acid. Convert hydroxy functional group into carboxylic group and vice versa giving necessary examples. [3]

7. Write a concise account on Rosenmund's reduction. Identify A and B in the following reaction.

$$A \xrightarrow{O_3} B \xrightarrow[\triangle]{Zn/H_2O} 2\ Acetone$$ [3]

8. Write the different chemical reaction which occurs in the zone of reduction. [2]

9. Give the chemistry about rusting of iron. [2]

The End

Grade: - XII	**Set – B**	Full Marks:- 25
Stream: Science		Pass Marks:-10
Subject: - Chemistry		Time : 45Mins

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate the full marks

Attempt all questions.

1. Mention the important application of Ostwald's dilution law. Is it excrementally possible to have P^H of a solution -ve? If not why? Calculate the P^H of a solution obtained by mixing 100ml of 0.005N HCN with 200ml of water. [3]

2. Define ionic product of water and extent of ionization of weak electrolyte. Calculate % dissociation of CH_3COOH in a solution containing 0.4M in 200ml of its solution. (K_a of $CH_3COOH = 1.8 \times 10^{-5}$ [3]

3. Describe about the theory of origin of single electrode potential with reference to oxidation potential and reduction potential. [3]

   OR

   Zn and Mg can liberate H_2 gas from dilute mineral acids but copper can not, explain with appropriate reason. Given that, $E^0_{Zn^{++}/Zn}$= -0.76V , $E^0_{Mg^{++}/Mg}$ = -2.34V and $E^0_{Cu^{++}/Cu}$ = 0.34V respectively. Explain with calculations. [3]

4. How would you convert the followings ? write necessary chemical reactions .
   a. Trichloroethanal into DDT
   b. Toluene into chlorobenzene
   c. Phenol into acetophenone. [3]

5. Give detailed chemistry about method of preparation of 1^0 , 2^0 and 3^0 alcohols using carbonyl compounds. How would you obtain ethanol from ethanamine? [3]

6. How would you obtain acetic acid using method of carbonation, hydrolysis of 1,1,1-trihalo alkanes and using sodium alkoxide. Give example reactions for each. [3]

7. Write a concise account on Rosenmund's reduction. Identify A and B in the following reaction.

$$A \xrightarrow{O_3} B \xrightarrow[\triangle]{Zn/H_2O} 2\,Acetaldehyde$$

[3]
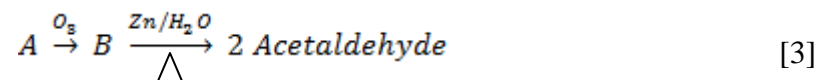
8. Describe the manufacture of steel by open hearth process. [2]

9. Write an electrochemical theory of rusting. [2]

The End