

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. THIRD SEMESTER EXAMINATION, DECEMBER 2018

SECOND YEAR [BATCH 2017-20]

CHEMISTRY [General]

Paper : III

Date : 18/12/2018

Time : 11 am – 1 pm

Full Marks : 25

(Attempt one question from each Unit)

Unit - I

[13 marks]

1.
 - a) Hydroxylamine has both oxidising and reducing properties. Explain with equation. [3]
 - b) Compare H_3PO_3 and H_3PO_2 in regard to (i) Acid Strength (ii) Reducing properties. [2]
 - c) What is 'Inert-pair effect'? SnCl_2 is a strong reducing agent but PbCl_2 is not. Explain [2]
 - d) The products of hydrolysis of NCl_3 is different compared to PCl_3 . Explain. [2]
 - e) Arrange the following in increasing order of their Lewis acidity and explain your arrangement.
(i) SiCl_4 , SiI_4 , SiCl_4 , SiF_4
(ii) BCl_3 , BF_3 , BBr_3 , BI_3 [2+2]
2.
 - a) Write a short note on silicones. [3]
 - b) What happens when (give balanced equation)
(i) MnSO_4 is treated with sodium bismuthate in acid medium, give balance chemical equation? [2]
(ii) Borax is heated on a Pt-loop in an oxidising flame with a pinch of cobalt oxide. [2]
 - c) Explain with example symmetrical and unsymmetrical cleavage of diborane. [3]
 - d) Explain: [3]
(i) CO_2 is a gas but SiO_2 is solid.
(ii) What is diagonal relationship? Explain it with examples.

Unit – II

[12 marks]

3.
 - a) What are pseudohalogens? How they differ from halogens? [3]
 - b) Describe the preparation of polythiazyl. [2]
 - c) Discuss the geometry of the molecule XeF_6 [2]
 - d) Complete the following: [2]
(i) $\text{XeF}_6 + \text{H}_2\text{O} \longrightarrow$
(ii) $\text{XeF}_6 + \text{SiO}_2 \longrightarrow$
 - e) Arrange the following halogen oxo-acids in order to their acid strength: HOCl , HClO_2 , HClO_3 and HClO_4 [2]
 - f) Explain why H_2O_2 can act both as an oxidising and reducing agent? [1]
4.
 - a) How sodium thiosulphate is prepared? [2]
 - b) Give the chemical structure of (i) Peroxodisulphuric Acid (ii) Paraperiodic Acid [2]
 - c) What happens when (i) AgNO_3 is added to a solution of $\text{Na}_2\text{S}_2\text{O}_3$ (ii) SO_2 gas is passed into a solution of acidified $\text{K}_2\text{Cr}_2\text{O}_7$ solution. [3]
 - d) How do you determine the available chlorine in a given sample of bleaching powder? [2]
 - e) How do you detect chloride ion in the presence of bromide and iodide? Give chemical equation. [2]
 - f) Give the chemistry of use of HF for etching glass. [1]