

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. THIRD SEMESTER EXAMINATION, DECEMBER 2016

SECOND YEAR [BATCH 2015-18]

CHEMISTRY [General]

Paper : III

Date : 16/12/2016

Time : 11 am – 1 pm

Full Marks : 25

[Attempt one question from each Unit]

Unit – I

[13 marks]

1. a) Hydrazine has both oxidising & reducing properties. Explain with equations. [3]
b) The products of hydrolysis of NCl_3 is different compared to PCl_3 . Explain. [2]
c) Discuss the preparation and structure of diborane. [3]
d) PbI_4 does not exist. Explain. [1]
e) Compare and contrast the properties of B and Al considering the following points :
(i) Elemental State, (ii) Halides [4]
2. a) Write short notes on 'Freons'. [3]
b) Compare HNO_2 and HNO_3 in regard to (i) strength as acids, (ii) oxidation state of nitrogen, (iii) ability to act as oxidant and reductant and (iv) structure of their ions. [1+1+2+1]
c) What is meant by catenation? Discuss the catenating properties of C, Si and Ge in their compounds. [1+3]
d) State one chemical characteristic to establish that CN^- is a pseudohalide. [1]

Unit – II

[12 marks]

3. a) What are pseudohalogens? How they differ from halogens? [3]
b) i) Why inert gases are monoatomic?
ii) Complete the following :
 $\text{XeF}_6 + \text{H}_2\text{O} \rightarrow$
 $\text{XeF}_6 + \text{SiO}_2$ [3]
c) Give the balanced ionic equation for the hydrolysis of ICl_3 in aqueous sodium hydroxide. [2]
d) Give the structure of [4]
i) Paraperiodic acid ii) Caro's acid
iii) Peroxodisulphuric acid iv) Pyrosulphuric acid
4. a) How will you confirm the presence of Iodide in presence of Bromides. [2]
b) Show that water can act both as an oxidising and reducing agent. [2]
c) Discuss the structure and bonding in the following compounds : [3]
Dithionous acid ($\text{H}_2\text{S}_2\text{O}_4$)
d) What happens when : [2+2]
i) SO_2 gas is passed through a concentrated solution of sodium nitrite and sodium carbonate at low temperature.
ii) AgNO_3 is added to a solution of $\text{Na}_2\text{S}_2\text{O}_3$.
e) State with equation, what happens when XeF_6 is treated with aqueous sodium hydroxide. [1]