

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

B.A./B.SC. FOURTH SEMESTER EXAMINATION, MAY 2012

SECOND YEAR

CHEMISTRY (Honours)

Date : 21/05/2012

Time : 11 am – 12.15 pm

Paper : IV

Full Marks : 25

Group - C

Unit – I

(Answer **any one** question)

9. a) Compare halogens with respect to their physical properties with special reference to the electron affinity, colour and bond dissociation energy. Write down the anomalies of F_2 amongst the halogens. [3+2]
b) How pure Germanium is prepared? [3]
c) Explain with reasons which one is better reducing agent; H_3PO_3 and H_3PO_2 ? [1]
d) Write short notes on (**any two**) : [3×2]
i) Fluorocarbons
ii) Oxidising power of halogens
iii) Silicones
10. a) Discuss the variation in properties of Group – 14 elements with reference to— i) oxidation states
ii) catenation [2+2]

Or,

Write a short account on oxides of Halogens. [4]

- b) Explain (**any three**) : [2+2+2]
i) Nitrogen molecule is diatomic but phosphorous molecule is tetraatomic.
ii) Water is a weaker reducing agent than hydrogen sulphide.
iii) A) $Conc. HNO_3$ behaves as a base in liquid HF.
B) $SnCl_2$ dissolves in HCl but not in HNO_3 .
iv) Compound KHF_2 is known but compounds $KHCl_2$ and $KHBr_2$ do not exist.
v) Solid Iodine is a semiconductor at room temperature.
c) How would you prove that $GaCl_2$ exist as $Ga^+[GaCl_4]^-$? [1]
d) i) Show that the two sulfur atoms in thiosulfate are non-equivalent.
ii) Give a short account on cationic boron. [2+2]

Unit – II

(Answer **any one** question)

11. a) Compare and contrast periodates with perchlorates. [2]
b) Give methods for preparation and structures of the following : (i) $XeOF_4$ (ii) XeO_3 [2+2]
c) Illustrate : Hydroxylamine can function both as an oxidising and reducing agent. [2]
d) Discuss the role of NO_x for the depletion of ozone Layer. [2]
12. a) Discuss the structures and bonding (**any one**) : [3]
i) Phosphazenes ii) Diborane
b) What are interhalogens? How are they prepared? Give formula and structure of a noble gas compound that is isostructural with ICl_4^- . [3+2]
c) Comment on the statement that He and Ne can not exist. [2]

