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Roll No. 2017/13/34162312 Exam Code : D-23

Subject Code—60467

B.Sc. EXAMINATION

(Main/Re-appear) (Batch 2019 Onwards)

(Fifth Semester)

CHEMISTRY

CCL-504 (ii) Paper-II

Chemistry of Main Group Elements-II

Time : 3 Hours

Maximum Marks : 80

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. Use Log table or simple calculator when required.

1. (a) Draw the structure of diborane.
- (b) Why is H_3PO_2 monobasic ?
- (c) Predict the shape and hybridization of SF_4 and I_3^- .

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- (d) Why do most of noble gas compounds involve Xe, F and O ?
- (e) How does XeF_2 react with SbF_5 ?
- (f) What are the inorganic polymers ? Discuss the main difference between inorganic and organic polymers.
- (g) What are the Zeolites ? Give two examples.
- (h) Nitric acid acts only as an oxidizing agent while nitrous acid can act both as an oxidizing and reducing agent. Why ?

2×8=16

Unit I

- 2. (a) Describe the structure of N_2O_4 . 4
- (b) Name the various oxide of Phosphorus. Write their formula and draw their structures. 6
- (c) Complete the following reactions : 6
 - $\text{B}_2\text{H}_6 + \text{NH}_3 \rightarrow$
 - $\text{B}_2\text{H}_6 + \text{H}_2\text{O} \rightarrow$

- 3. (a) Write the name and formulae of oxo acid of chlorine. Explain the trend of their acidic strength giving reasons. 6
- (b) Give one method of preparation. Draw the structure and oxidation state of central atom of Caro's and Marshall' acid. 6
- (c) Compare the acidic character of the following : 4
 - HClO , HClO_2 , HClO_3 and HClO_4

Unit II

- 4. (a) Discuss the geometry of the following : 6
 - (i) ClF_4^+
 - (ii) IF_4^-
 - (iii) ICl_2^-
- (b) What are the pseudohalide ions and pseudohalogens ? Explain with example. 6
- (c) Why are the pentahalides of phosphorus more covalent than trihalides ? 4

5. (a) What are oxyhalide of sulphur ? Discuss their preparation, properties and structure. 6
- (b) Discuss the preparation, properties and structure of PCl_5 . 6
- (c) ICl_7 does not exist while IF_7 exists. Explain. 4

Unit III

6. (a) Why do He and Ne not form clathrates ? 2
- (b) Write the reaction by which first noble gas compounds is formed. 2
- (c) Give one method of preparation and structure of XeF_4 . Give its reaction with H_2O , BCl_3 . 8
- (d) What are the causes of low reactivity of noble gases ? 4

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7. (a) What are Clathrates ? Discuss their method of preparation and general characteristics. 10
- (b) Write short note on the structure of : 6
- (i) XeF_2
- (ii) XeF_6
- (iii) XeO_3

Unit IV

8. (a) What are the Phosphazenes ? Discuss their structure and important properties. 10
- (b) How is cyclic $(\text{NPCl}_2)_2$ prepared ? Give an account of its nucleophilic substitution reactions. 6
9. (a) What are silicones ? Discuss their structure and important properties of silicones. 10
- (b) How will you convert borazine to inorganic naphthalene and inorganic cyclohexane ? 6

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