

2019

B.Sc.

4th Semester Examination

CHEMISTRY (Honours)

Paper - C9T

(Inorganic Chemistry)

Full Marks : 40

Time : 2 Hours

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

Group - A

1. Answer any *five* questions : 5×2
- (a) HF cannot be stored in glass bottle. Explain.
 - (b) Write two characteristic features of Ellingham diagram.
 - (c) What are fluorocarbons ? How are they prepared ?

[Turn Over]

- (d) Suggest a structure for a dimer of $BeCl_2$ and explain how its formation illustrates $BeCl_2$ acting as a Lewis acid.
- (e) Why the reactivity at borazine contrasts sharply with that of benzene ?
- (f) $[Co(NH_3)_5NO_2]^{2+}$ may have two different colors. Comment.
- (g) What happen when XeO_3 reacts with KI in presence at dil H_2SO_4 ?
- (h) Draw the structure of polythionates of type $[SnO_6]^{2-}$. How are they prepared ?

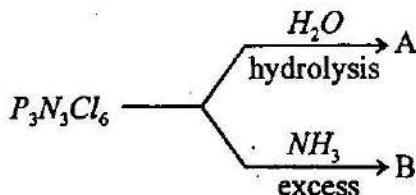
Group - B

Answer any four questions. 4×5

2. (a) Write notes on the structures of XeF_2 , XeF_4 and XeF_6 . 3
- (b) Outline the principle of zone refining. 2
3. (a) State basic concepts of Werner's coordination theory and mention its limitations. 3

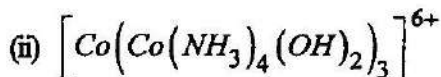
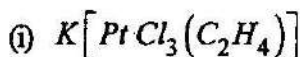
(3)

(b) Give the product *A* and *B*



2

4. (a) Write IUPAC nomenclature of



2

(b) Describe how BH_3 can behave as both an electron acceptor and an electron donor in the adduct $OC.BH_3$.

2

(c) Explain why PCl_3 and $SbCl_3$ behave differently in water.

1

5. (a) $B(OH)_3$ behave as a weak acid but acid strength increases in presence of 1, 2-diols. Explain.

2

[Turn Over]

(b) Suggest why the NSi_3 skeleton in $N(SiMe_3)_3$ is planar. 2

(c) Complete the following equation



6. (a) Both NO and NO_2 are odd electron molecules but only NO_2 dimerizes readily. Explain. 2

(b) Give a short account on the structure and bonding of B_2H_6 . 3

7. (a) What are siloxanes ? 1

(b) Show stepwise hydrolysis product of P_4O_{10} . 2

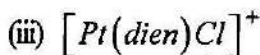
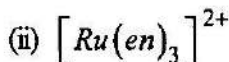
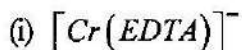
(c) Describe a suitable synthesis of Xenon trioxide. 2

Group - C

Answer any *one* question. 1×10

8. (a) Copper can be extracted by hydrometallurgy but not zinc. Explain. 2

(b) Which of the complexes



are chiral ?

3

(c) Explain the different colours of halogen molecules.

2

(d) Discuss the structure of $S_2O_3^{2-}$.

2

(e) Give the application of noble gases.

1

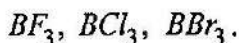
9. (a) Write note on pseudohalide.

2

(b) What is ferrosilicon ?

1

(c) Arrange the following in order of increasing acid strength and give reasons for your choice :



3

[Turn Over]

(d) The triiodide ion, I_3^- is linear, but I_3^+ is bent.

Explain.

2

(e) The bond angles for the hydrides of the Group 15 elements are as follows : NH_3 , 107.8° ,

PH_3 , 93.6° ; AsH_3 , 91.8° ; and SbH_3 , 91.3° .

Account for this trend.

2
