2024

4th Semester Examination

CHEMISTRY (Honours)

Paper : C 9-T

[Inorganic Chemistry-III]

[CBCS]

Full Marks : 40 Time : Two 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

Answer any ***five*** questions from the following : 2×5=10

1. R_3PO is more stable than R_3NO — Explain.
2. What do you mean by perfect complex? Give an example.
3. Write down the structure and bonding of borazine.
4. Write the structures of B_4H_{10}.
5. Aqueous $BeCl_2$ solution is acidic while that of $CaCl_2$ is neutral — explain.

P.T.O.

6. Why is CO_2 a gaseous monomer whereas SiO_2 is a polymeric solid?

7. Molten ICl_3 has a high conductivity — explain.

8. What happens when Sulphur reacts with liquid NH_3?

Group - B

Answer any ***four*** questions from the following : 5×4=20

9. (a) $\left[Co(en)_3\right]^{3+}$ is more stable than $\left[Co(NH_3)_6\right]^{3+}$ — Explain.

   (b) How many isomers are possible for $\left[Cr(en)_2(NCS)Cl\right]^{+}$ ion?

   Give reasons for your answer. 2+(1+2)

10. (a) NaN_3 is more stable than HN_3 — explain.

    (b) What is inorganic graphite and why is it so called? 2+(1+2)

11. (a) Draw all possible isomers of $\left[Co(NH_3)(OH)_2Cl_3\right]^{2-}$ ion.

    (b) NF_3 is inert to hydrolysis while PF_3 is reactive — explain.

    (c) Write the product of the following reaction $XeF_4 + NaF \rightarrow ?$ 2+2+1

12. (a) What are fluorocarbons? How are they prepared?

(b) How does XeF_6 reacts with water? Give chemical equation. (1+2)+2

13. (a) State basic concepts of Werner's coordination theory and mention its limitations.

(b) What do you mean by linkage isomerism? Give an example. 3+2

14. (a) What is spiegel?

(b) What do you know about Ellingham diagram? Illustrate with example.

(c) What is thermite mixture? 1+(2+1)+1

Group - C

Answer any ***one*** question from the following : 10×1=10

15. (a) What experiment led Bartlett towards the synthesis of the compounds of inert gases?

(b) Write down the IUPAC names of the following complexes —

(i) $K\left[PtCl_3\left(C_2H_4\right)\right]$

(ii) $\left[Co\left(NH_3\right)_6\right]\left[CdCl_5\right]$

P.T.O.

(c) Indicate the oxidation number of P atom in $H_4P_2O_6$ and $H_4P_2O_7$.

(d) Write a short note on silicone

(e) Give the structure of Caro's acid. 2+2+2+3+1

16. (a) Write a short note on Aluminosilicates.

(b) Explain the structure of BeH_2 molecule.

(c) How do you prepare Ni from $Ni(CO)_4$ using Mond's process?

(d) What do you mean by pyrometallurgy? 3+3+2+2