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B.Sc./4th Sem (H)/CHEM/23(CBCS)

2023

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 : $2 \times 5 = 10$

1. Which mixture is used in thermite welding?
2. What do you mean by imperfect complex? Give an example.
3. Write down the relationship between overall and step-wise formation constants.
4. Solution of borax behaves like buffer solution — Comment.
5. Hydrolysis of SiCl_4 and CCl_4 produce different types of products — Explain.

P.T.O.

(2)

6. $B-F$ bond distances in BF_3 and BF_4^- are $1.29\text{\AA}$ and $1.42\text{\AA}$, respectfully — explain.
7. N_3^- is a pseudohalide — explain.
8. What is the composition of German silver alloy?

Group - B

Answer any **four** of the following : $5 \times 4 = 20$

9. (a) What happens when $B(OH)_3$ reacts with conc. H_2SO_4 ?
(b) Compare the hydrolytic behaviour of NCl_3 , PCl_3 and $AsCl_3$.
(c) What is chelate effect? 2+2+1
10. (a) $(CH_3)_3N$ and $(SiH_3)_3N$ reacts with HCl to give different products — explain.
(b) Explain the linear symmetrical structure of HF_2^- ion.
(c) What do you mean by clathrate compound? 2+2+1
11. (a) What are the differences between ambidentate and polydentate ligands? Give one example in each case.
(b) Arrange the following compounds in increasing order of their basic strength —

NH_3 , NCl_3 and NF_3 .

4+1

12. (a) What is borazole? Why it is called inorganic benzene?

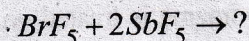
(b) What are the structures of XeF_4 and XeF_6 ?

1+2+2

13. (a) How many stereoisomers are possible for the compound $[Cr(NH_3)_3Cl_3]$?

(b) Explain the order of solubility of following compounds in water $LiF < NaF < KF < CsF$ and $LiI > NaI < KI < CsI$.

(c) Give the structure of the product formed —



2+2+1

14. (a) Write down the principle of zone refining.

(b) What is anodising? Give an example.

(c) What is Copper matte?

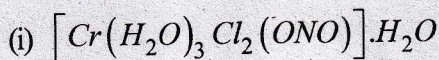
2+2+1

Group - C

Answer any **one** question : $10 \times 1 = 10$

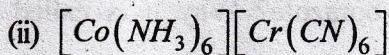
15. (a) XeF_6 can not be stored in glass apparatus — Explain.

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



P.T.O.

(4)



(c) Write the balanced chemical equation when XeO_3 reacts with KI in presence of dilute H_2SO_4 .

(d) Write the special features in the chemistry of silicates.

(e) Show that hydrazine and hydroxylamine possesses oxidising as well as reducing property.

2+2+2+3+1

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

(b) How is hydrazine prepared? What happens when acidified solution of hydrazine is treated with KIO_3 ?

(c) P_4 , P_4O_6 and P_4O_{10} are related structure — explain.

(d) How would you obtain pure Ge? 3+(1+2)+2+2
