

Total Pages : 4

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  $\text{SiCl}_4$  and  $\text{CCl}_4$  produce different types of products — Explain.

P.T.O.

( 2 )

6. B-F bond distances in  $\text{BF}_3$  and  $\text{BF}_4^-$  are 1.29Å and 1.42Å, respectively — explain.
7.  $\text{N}_3^-$  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  $\text{B(OH)}_3$  reacts with conc.  $\text{H}_2\text{SO}_4$ ?
- (b) Compare the hydrolytic behaviour of  $\text{NCl}_3$ ,  $\text{PCl}_3$  and  $\text{AsCl}_3$ .
- (c) What is chelate effect? 2+2+1
10. (a)  $(\text{CH}_3)_3\text{N}$  and  $(\text{SiH}_3)_3\text{N}$  reacts with  $\text{HCl}$  to give different products — explain.
- (b) Explain the linear symmetrical structure of  $\text{HF}_2^-$  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 —
- $\text{NH}_3$ ,  $\text{NCl}_3$  and  $\text{NF}_3$ . 4+1

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

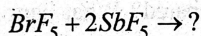
(b) What are the structures of  $XeF_4$  and  $XeF_6$ ?

1+2+2

13. (a) How many stereoisomers are possible for the compound  $[Cr(NH_3)_3 Cl_3]$ ?

(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?

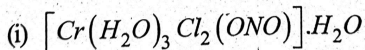
2+2+1

### Group - C

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

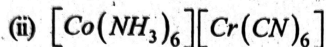
15. (a)  $XeF_6$  can not be stored in glass apparatus — Explain.

(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

---