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

2023

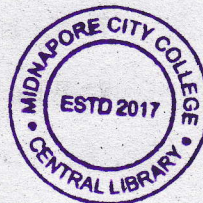
4th Semester Examination

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

P.T.O.



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6.  $B-F$  bond distances in  $BF_3$  and  $BF_4^-$  are 1.29 Å and 1.42 Å, 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 —



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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 —



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

(b) What is anodising? Give an example.

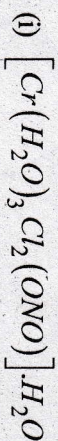
(c) What is Copper matte?  $2+2+1$

**Group - C**

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

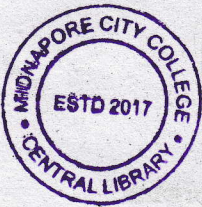
15. (a)  $XeF_6$  can not be stored in glass apparatus — Explain.

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

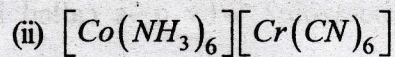


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- (c) Write the balanced chemical equation when  $XeO_3$  reacts with KI in presence of dilute  $H_2SO_4$ .
- (d) Write the special features in the chemistry of silicates.
- (e) Show that hydrazine and hydroxylamine possesses oxidising as well as reducing 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
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