



K23U 2334

Reg. No. : .....

Name : .....

V Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/  
Improvement) Examination, November 2023  
(2019 – 2021 Admissions)  
Core Course in Chemistry/Polymer Chemistry  
5B08CHE/PCH : INORGANIC CHEMISTRY

Time : 3 Hours

Max. Marks : 40

*Instruction : Answer the questions in English only.*

## SECTION – A

Answer **all** questions. **Each** carries **1** mark.

1. The colour of  $\text{Sc}^{3+}$  is
2. The effective atomic number of  $[\text{Co}(\text{NH}_3)_6]^{3+}$  is
3. The shape of  $[\text{Ni}(\text{CO})_4]$  is
4. Give an example for a zinc containing enzyme. (4×1=4)

## SECTION – B

Answer **any 7** questions out of **10**. **Each** carries **2** marks.

5. Why the effective magnetic moment of transition metal compounds is only that due to spin contribution ?
6. Why gadolinium shows only +3 oxidation state ?
7. Why actinide ions are generally coloured ? What is the colour of the actinide ions with seven 5f electrons ?
8. Which compound has higher stability constant and why ?  
 $[\text{Fe}(\text{CN})_6]^{3-}$  or  $[\text{Fe}(\text{CN})_6]^{4-}$  ?
9. What are high spin octahedral complexes ? Explain with an example. P.T.O.

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10. What is meant by crystal field splitting ? What is the CFSE of an octahedral complex with  $d^5$  configuration ?
11. What is meant by Bohr Effect ?
12. Calculate the number of metal-metal bonds in  $\text{Mn}_2(\text{CO})_{10}$ .
13. Differentiate between homoleptic and heteroleptic organometallic compounds.
14. What are geopolymers ? Give one example. (7×2=14)

## SECTION – C

Answer **any 4** questions out of **6**. **Each** carries **3** marks.

15. What is lanthanide contraction ? Briefly explain its consequences.
16. How the various factors affect the stability of complexes ?
17. Discuss the structure and magnetic nature of  $[\text{Fe}(\text{CN})_6]^{3-}$  on the basis of VB theory.
18. Briefly explain the toxicity of lead.
19. Differentiate between Haemoglobin and Myoglobin.
20. How carbonyls are classified ? Explain. (4×3=12)

## SECTION – D

Answer **any 2** questions out of **4**. **Each** carries **5** marks.

21. How lanthanides are separated by ion-exchange chromatography ?
22. Discuss the application of complex formation in qualitative and quantitative analysis with illustrative examples.
23. Briefly explain the application of CFT in explaining the magnetic properties and colour of metal complexes with examples.
24. Write note on (a) Mechanism of oxygen binding by Haemoglobin (b) Ionic organometallic compounds. (2×5=10)