Exam. Code : 103204

Subject Code : 1347

B.A/B.Sc. Semester—IV

CHEMISTRY

Paper—Inorganic Chemistry—III

Time Allowed—3 Hours] [Maximum Marks—35

PART—A

Note :— All the questions are compulsory. Each question carries 1 mark. The maximum length of answer can be **ONE-THIRD** of a page.

1. The complex $Co(NH_3)_5CO_3Cl$ has two ionisation isomers. Write their structural formulae and give their IUPAC names.

2. Which of the two complexes $[Ni(CN)_4]^{2-}$ or $[Zn(NH_3)_4]^{2+}$ obey EAN rule ?

3. Give important advantages of liquid SO_2 as non aqueous solvent, in spite of its toxic nature.

4. What is Latimer diagram ?

5. Why do lanthanides have poor tendency to form complexes ?

6. What are transuranic elements ? Name at least four transuranic elements.

7. What is cooperativity in hemoglobin ?

8. Give functions of myoglobin.

PART—B

SECTION—I

Note : – Attempt any **TWO** questions from each Section. Each question carries **4.5** marks. The maximum length of the answer can be up to **FIVE** pages.

9. What are the important postulates of Werner's coordination theory ? How does it account for non-ionic nature of $CoCl_3 3NH_3$? Explain.

10. How does valence bond theory explain the following :

    (a) $[NiCl_4]^{2-}$ is paramagnetic and tetrahedral ?

    (b) $[Ni(CN)_4]^{2-}$ is diamagnetic and square planar ?

11. Discuss acid-base reactions, complex formation reactions, and ammoniation reactions in liquid ammonia. Give one example in each case.

SECTION—II

12. What is Frost diagram ? Discuss the Frost diagram of Manganese in acidic medium.

13. Account for the variable oxidation states and magnetic properties of lanthanides.

14. (a) Discuss Pourbaix diagram of any one system. What information does it give ?

    (b) Why do lanthanides form a closely knit group with similar chemical and physical properties ?

SECTION—III

15. Compare and contrast actinides and lanthanides.

16. Discuss the role of alkali and alkaline earth metal ions in biological system.

17. (a) Give general electronic configuration of lanthanides and actinides.

    (b) Chemical separation of lanthanides is difficult, why ?

    (c) What is the importance of f-block elements ?