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M – 1490

Reg. No. : .....

Name : .....

**Fifth Semester B.Sc. Degree Examination, December 2021**

**First Degree Programme under CBCSS**

**Chemistry**

**Core Course VI**

**CH 1542 : INORGANIC CHEMISTRY III**

**(2017 Admission)**

Time : 3 Hours

Max. Marks : 80

- I. Answer **all** questions Each question carries **1** mark.
1. State Beer Lamberts law.
  2. Name the Fe-S protein which is known as biological capacitor"?
  3. What is the electronic configuration of Curium (Cm).
  4. Name any two transition metal used as catalyst in hydrogenation process of alkene.
  5. Write the IUPAC name of the complex  $K_4 [Ni(CN)_4]$ .
  6. What is the metal present in
    - (a) Chlorophyll
    - (b) Myoglobin?
  7. How many number of unpaired electron present in  $XeOF_4$  and what is its structure.

P.T.O.

8. Most of the transition metal compounds are coloured. Why?
9. On the basis of 18 electron rule, identify the 1st row transition element present in the complex  $[M(CO)_6]^+$  ?
10. Give any two example for chelating ligand.

**(10 × 1 = 10 Marks)**

II. Answer **any eight** questions. Each question carries **2** marks.

11. Write the preparation method for  $K_2Cr_2O_7$ .
12. What is the principle used in Atomic Absorption Spectroscopy?
13. Explain the major difference between SEM and TEM.
14. What are main factors affecting the stability of complexes?
15. Explain the role of Hemoglobin in the dioxygen transport.
16. What are the different type of stereoisomers present in octahedral metal complex?
17. Write the preparation and properties of  $KMnO_4$ .
18. What are pseudo halogen compound? Explain with suitable examples?
19. Comment on the important uses of noble gases.
20. What are the possible products of the reaction between  $XeF_4$  and water?
21. Explain the auto reduction process in the Cu metallurgy.
22. Explain the bonding in metal carbonyl?

**(8 × 2 = 16 Marks)**

III. Answer **any six** questions. Each question carries **4** marks.

23. Verify the 18 electron and comment the stability of the following complexes  $[Ni(en)_3]^{2+}$ ,  $Cr(CO)_6$ ,  $V(CO)_6$  and  $[Co(H_2O)_6]^{2+}$
24. Write short note on Cytochrome?
25. Explain the mechanism or  $Na^+ / K^+$  transports in cells ( $Na^+ / K^+$  pump)?
26. The C-O stretching frequency for  $[Ni(CO)_4]$ ,  $[Co(CO)_4]^-$  and  $[Fe(CO)_4]^{2-}$  are 2060, 1890 and  $1790\text{ cm}^{-1}$  respectively, Account for this observation.
27. Write briefly on the role of metal ions in biological systems.
28. Write short note on electrometallurgy of aluminium.
29. What are the main applications of organometallic compounds?
30. Discuss interhalogen compounds.
31. What are inert and labile metal complexes? Give example.

**(6 × 4 = 24 Marks)**

IV. Answer **any two** questions each question carries **15** marks.

32. (a) Explain the isolation of lanthanides from monazite.  
(b) What is lanthanide contraction and what are its consequences  
(c) How they differ from actinides?
33. Explain the theory of
  - (a) XRD
  - (b) DSC
  - (c) STM
  - (d) TG and
  - (e) DTA.

34. (a) Explain the various process involved in the concentration of ore.  
(b) Explain any four metal refining process used in metallurgy.
35. Write short note on synthesis, structure, bonding and properties of
- (a) ferrocene  
(b) Zeise's salt and  
(c) Dibenzyl chromium.

**(2 × 15 = 30 Marks)**

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