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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2017
(First Degree Programme under CBCSS)
CHEMISTRY
Core Course
CH 1542 : Inorganic Chemistry – III
(2013 Admission Onwards)

Time : 3 Hours Max. Marks : 80

All Saints' College Trivandrum

SECTION – A

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

1. What is the unit of magnetic moment ?
2. Maximum oxidation of Os is _____
3. What is the co-ordination number of metal in $[NiCl_4]^{2-}$?
4. The number of unpaired electrons present in Fe^{2+} is _____
5. Give the IUPAC name of $K_4[Fe(CN)_6]$.
6. What is Wilkinson's catalyst ?
7. The number of bridging CO present in $Ir_4(CO)_{12}$ is
8. In haemoglobin iron is present in _____ oxidation state.
9. The purple colour of $KMnO_4$ is due to _____
10. Give an example for hexadentate ligand. **(10×1=10 Marks)**

SECTION – B

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

11. What is an ambidentate ligand ? Give examples.

P.T.O.

12. Which has got greater tendency to form complexes lanthanides or actinides ? Why ?

13. Zn, cd and Hg are not considered as transition metals. Why ?

14. Enthalpies of atomisation of transition elements are higher than those of alkali and alkaline earth metals. Explain.

15. Define the term ligand. Give two examples.

16. What is the oxidation and co-ordination number of Co in $[Co(en)_2(H_2O)CN]^{2+}$?

17. State and explain 18 electron rule.

18. Give any three examples for iron protein.

19. How haemoglobin differ from myoglobin ?

20. $2NaBH_4 + 3H_3PO_4 \rightarrow \underset{?}{_____}$

21. Explain why B-F bond is larger in BF_4^- than in BF_3 molecule.

22. Explain the following :
    a) Chromium is a typical metal while mercury is a liquid metal.
    b) Cobalt (III) is stable in aqueous solution but in the presence of strong ligands it is easily oxidised to cobalt (III). **(8×2=16 Marks)**

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SECTION – C

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

23. Comment on the oxidation state of lanthanides.

24. Explain why $[CoF_6]^{3-}$ is paramagnetic while $[Co(NH_3)_6]^{3+}$ is diamagnetic.

25. Write any four application of co-ordination compounds.

26. What are the factors that affect stability of metal complexes ?

27. Why Sm^{2+}, Eu^{2+}, Yb^{2+} ions in solutions are good reducing agents but an aqueous solution of Ce^{4+} is a good oxidising agent ?

28. How the d-d spectra differ from F-F spectra ?

29. Which are the different types of silicates ?

30. What are silicones ? Give their preparation and uses.

31. What are interhalogen compounds ? **(6×4=24 Marks)**

SECTION – D

Answer **any two** questions. **Each** question carries **15** marks.

32. How lanthanides are extracted from monazite ?

33. Using crystal field theory, write the electronic configuration of the central metal atom and determine the magnetic moment value of

    1) $[CoF_6]^{3-}$, $[Co(H_2O)_6]^{2+}$, $[Co(CN)_6]^{3-}$

    2) $[FeF_6]^{3-}$, $[Fe(H_2O)_6]^{2+}$, $[Fe(CN)_6]^{4-}$

34. Write a note on function and mechanism of dioxygen binding of haemoglobin and myoglobin.

35. a) What are carboranes ? How are they obtained ?

    b) Give an account of Zeolites and their uses. **(15×2=30 Marks)**

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