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F – 2403

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2018  
(First Degree Programme Under CBCSS)

CHEMISTRY

Core Course – VI

CH 1542 : Inorganic Chemistry – III  
(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all**, **each** carries **1** mark.

1. The number of unpaired electrons in  $\text{Fe}^{2+}$  is \_\_\_\_\_
  2. The general electronic configuration of inner transition metal is \_\_\_\_\_
  3. In the octahedral ligand field theory, the 3d orbitals will split into \_\_\_\_\_ levels.
  4. The hybridisation of  $\text{XeF}_6$  is \_\_\_\_\_
  5. The number of bridging CO present in  $\text{Mn}_2(\text{CO})_{10}$  is \_\_\_\_\_
  6. Give an example for hexadentate ligand.
  7. What is the co-ordination number of Cr in  $\text{NH}_4[\text{Cr}(\text{NH}_3)_2(\text{NCS})_4]$  ?
  8. The purple colour of  $\text{KMnO}_4$  is due to \_\_\_\_\_
  9. Maximum oxidation number of Os is \_\_\_\_\_
  10. The groups satisfying the secondary valencies of a cation in a complex are called \_\_\_\_\_
- (10×1=10 Marks)**

P.T.O.



## SECTION – B

Answer any 8, each carries 2 marks.

11.  $\text{Zn}^{2+}$  salts are colourless. While  $\text{Cu}^{2+}$  salts are blue why ?
12. Why do transition metal form coloured compounds ?
13. The radii of elements from Cr to Cu are very close to one another. Why ?
14. How haemoglobin differ from myoglobin ?
15. Explain why palladium does not readily form stable carbonyl clusters like Ni and Pt unless stabilised by  $\sigma$  donor ligands like phosphene.
16.  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  is blue colour while  $\text{CuSO}_4$  is colourless. Why ?
17. What is an ambidentate ligand ? Give examples.
18. Zn, Cd and Hg are not considered as transition metals. Why ?
19. A complex having scandium in +3 oxidation state was found colourless. Why ?
20. What is inorganic benzene ? How is it prepared ?
21. What is the EAN of palladium in tetra chloro palladium (II) ion ?
22. Explain the term hapticity with an example. (8×2=16 Marks)

## SECTION – C

Answer any 6, each carries 4 marks.

23. Explain why :
  - a) Transition metal forms alloys with other transition elements
  - b) Why do transition metals form coloured compounds ?
24. Explain why Cu, Ag and Au, Zn, Cd and Hg have lower melting point than other transition metals.
25. Explain why  $[\text{CoF}_6]^{3+}$  is paramagnetic while  $[\text{Co}(\text{NH}_3)_6]^{3+}$  is diamagnetic.



26. Discuss the functions of haemoglobin and myoglobin.
27. What are inorganic polymers ? Write a note on their structure and applications.
28. Magnetic moment of  $[\text{MnCl}_4]^{2-}$  is 5.92 BM. Explain giving reason.
29. Why are d block elements called transition elements ? Give their important characteristics.
30. Explain why  $[\text{CoF}_6]^{3-}$  is paramagnetic while  $[\text{Co}(\text{NH}_3)_6]^{3+}$  is diamagnetic.
31. What are silicones ? Give their preparation and uses. **(6×4=24 Marks)**

SECTION – D

Answer any 2, each carries 15 marks.

32. a) Write a note on the structure of ferrocene.  
b) Explain the synthetic application of Ziegler-Natta catalyst.
  33. State a reason for the following :  
a) The molecular shape of  $[\text{Ni}(\text{CO})_4]$  is not the same as that of  $[\text{Ni}(\text{CN})_4]^{2-}$ .  
b) CO is a stronger complexing reagent than  $\text{NH}_3$ .
  34. a) What are inter halogens ? Discuss the preparation and structure of any four inter halogen compounds.  
b) What are carboranes ? How are they obtained ?
  35. Write a note on function and mechanism of dioxygen binding of haemoglobin and myoglobin. **(2×15=30 Marks)**
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