



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, October 2015
First Degree Programme under CBCSS
CHEMISTRY
(Core Course – VI)
CH1542 : Inorganic Chemistry – III
(2013 Admissions)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

Fill in the blanks :

1. Finely divided nickel is used as a catalyst in the _____ of oils.
2. The name 'metal of the future' is given to _____
3. The most common oxidation state shown by lanthanides is _____
4. The IUPAC name of $[\text{Co}(\text{NH}_3)_4 \text{Cl}_2]\text{Cl}$ is _____
5. The most probable EAN of 3d metal complexes is _____

Name the following :

6. An example for an ionic organometallic compound.
7. The oxidation state of iron in hemoglobin.
8. The chemical formula for enamel of human teeth.
9. An interhalogen compound with eight atoms in a molecule.
10. The general formula of polyphosphazenes.



SECTION – B

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

11. Calculate the EAN of Co in $\text{Co}_2(\text{CO})_8$ and $\text{Co}(\text{NH}_3)_6^{3+}$.
12. Give one example each for (a) linkage isomerism, (b) hydrate isomerism.
13. How many isomers are possible for $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]$? Explain.
14. $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ is blue while $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$ is colourless. Explain.
15. Give any two uses of TiCl_4 .
16. Lanthanides show only weak tendency to form complexes. Why ?
17. Distinguish between porphene and porphyrin.
18. Explain the term 'Bohr effect'.
19. How can $\text{Fe}(\text{CO})_5$ be converted into $\text{Fe}_2(\text{CO})_9$?
20. Comment on the structure of polymeric boron nitride.
21. What is inorganic benzene ? How is it prepared ?
22. Mention the uses of silicone oils.

SECTION – C

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

23. Write a note on the electronic spectra of Lanthanide complexes.
24. How is potassium dichromate manufactured ? Mention the main applications of it.
25. Applying the valence bond theory, compare the magnetic properties of $[\text{Ni}(\text{CN})_4]^{2-}$ and $[\text{NiCl}_4]^{2-}$.
26. Discuss the factors affecting the stability of complex compounds.
27. Draw the M.O. diagram of an octahedral ML_6 complex, considering only sigma bonds.



28. Explain the bonding in Zeise's salt.
29. What do you mean by co-operativity in the transport of oxygen by hemoglobin ?
30. Briefly explain the different steps involved in the manufacture of soda glass.
31. Write a note on zeolites.

SECTION – D

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

32. Explain the structure and industrial applications of Phosphorus, Boron and Silicon based Polymers.
 33. Write short notes on the biochemistry of Fe, Ca and Mg.
 34. Explain the crystal field theory applied to octahedral and tetrahedral complexes.
 35. Give a detailed account of the occurrence and isolation of lanthanides.
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