

VI Semester B.Sc. Examination, May 2017
(CBCS) (2016-17 and Onwards) (Fresh)
CHEMISTRY (Paper – VII)
Inorganic Chemistry

Time : 3 Hours

Max. Marks : 70

Instructions : i) The question paper has **two** Parts. Answer **both** the Parts.
ii) Write diagrams and equations **wherever** necessary.

PART – A

Answer **any eight** of the following questions. Each question carries **two** marks. (8×2=16)

1. Give the IUPAC name of the following complexes :
 - i) $[\text{Cu}(\text{NH}_3)_4]\text{SO}_4$
 - ii) $[\text{Co}(\text{H}_2\text{O})_3(\text{NH}_3)_3]\text{Cl}_3$
2. Write the optical isomers of $[\text{CoCl}_2(\text{en})_2]^+$.
3. What is spectrochemical series ?
4. Cis-platin is used in cancer therapy but not transplatin. Why ?
5. Define hardness of an abrasive. On what scale is it expressed ?
6. What is spalling in refractories and how can it be minimised ?
7. Mention any two characteristics of a propellant.
8. Define calorific value of a fuel.
9. Explain the role of Vitamin – B12 in living systems.
10. How is high temperature super conductor – Yttrium Barium Copper Oxide (YBCO) synthesised ? Give equation.
11. Give any two engineering applications of conducting polymers.
12. What are fullerenes ? Give an example.

P.T.



PART - B

Answer any nine of the following questions. Each question carries six marks.

(9×6=54)

13. a) Give the postulates of Werner's theory of co-ordination compounds. (4+2)
b) Calculate the EAN of Ni in the complex tetracarbonylnickel (O).
(Atomic No. of Ni = 28)
14. a) Explain the magnetic properties of $[\text{CoF}_6]^{3-}$ and $[\text{Co}(\text{NH}_3)_6]^{3+}$ ions based on CFT. (4+2)
b) Mention the type of isomerism exhibited by the following pair of co-ordination compounds :
i) $[\text{PtCl}_2(\text{NH}_3)_2]\text{Br}_2$ and $[\text{Pt Br}_2 (\text{NH}_3)_2]\text{Cl}_2$.
ii) $[\text{Cu} (\text{NH}_3)_4] [\text{PtCl}_4]$ and $[\text{Pt}(\text{NH}_3)_4] [\text{CuCl}_4]$.
15. a) Discuss the splitting of d-orbitals in tetrahedral complexes. (4+2)
b) What are ligands ? Give one example for a bidentate neutral ligand.
16. a) What are metal carbonyls ? Write the structure of $\text{Mn}_2 (\text{CO})_{10}$. (4+2)
b) Explain Monsanto acetic acid process.
17. a) Based on VBT, explain the geometry and magnetic property of $[\text{Co}(\text{NH}_3)_6]^{3+}$. (4+2)
b) Calculate the effective atomic number of $\text{Cr}(\text{CO})_6$ based on 18 - electron rule.
18. a) Describe the manufacture of portland cement by wet process. (4+2)
b) Mention any two characteristics of a fuel.
19. a) Give the composition and one application each for (i) borosilicate glass (ii) optical glass. (4+2)
b) Mention the constituents of varnishes.
20. a) Mention the raw materials and their roles in the manufacture of ceramic wares. (4+2)
b) Define octane number.



21. a) What are explosives ? How are they classified ? Give one example for each type. (4+2)
- b) Why preservatives are added to emulsion paints ? Give one example. (4+2)
22. a) Describe the manufacture of silicon carbide. (4+2)
- b) Write any two applications of high temperature super conductors. (4+2)
23. a) What is myoglobin ? Discuss its biological functions. (4+2)
- b) Mention the role of Ni and V in biological systems. (4+2)
24. a) Describe the conversion of polyacetylene to conducting polymer by doping method. (4+2)
- b) Write a note on carbon nanotubes. (4+2)
25. a) Explain mechanical alloying method of synthesis of nanomaterials. (4+2)
- b) Write a note on electrophilic aromatic substitution reaction with respect to fullerenes. (4+2)
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