

**GS-307**

VI Semester B.Sc. Examination, May/June - 2019  
(CBCS - Fresh+Repeaters) (2016-17 and onwards)

**CHEMISTRY****Paper VII : Inorganic Chemistry**

Time : 3 Hours

Max. Marks : 70

- Instructions :** 1. The question paper has **two** parts. Answer **both** the parts.  
2. Write diagrams and equations **wherever** necessary.

**PART - A**

Answer **any eight** of the following questions. Each question carries **two** marks. **8x2=16**

1. Give the IUPAC name of the following complexes :
  - (a)  $K_4[NiF_6]$
  - (b)  $[PtCl_2(NH_3)_4]Br_2$
2. Write the optical isomers of  $[Co(en)_3]^{3+}$  ion.
3. What are Low spin complexes ? Give an example.
4. Name the catalyst used in :
  - (i) Monsanto acetic acid process
  - (ii) Alkene hydrogenation
5. Mention the raw materials used in the manufacture of Ceramics.
6. What is the significance of PCE value of a refractory material ?
7. Culletts are used during the manufacture of glass. Give reasons.
8. Give any two advantages of gaseous fuels.
9. Explain the role of following trace elements in biological systems :
  - (i) Copper
  - (ii) Iron
10. Write a short note on Fullerenes.
11. Give any two engineering applications of conducting polymers.
12. Give any two commercial uses of  $C_{60}$ .



## PART - B

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

9x6=54

13. (a) Based on crystal field theory, explain the splitting of d-orbitals in octahedral complexes. 4+2
- (b) Calculate EAN of  $[\text{Cr}(\text{H}_2\text{O})_6]\text{Cl}_3$  [Atomic no. of Cr = 24]
14. (a) Discuss the following with respect to coordination complexes : 4+2
- (i) Hydrate Isomerism
- (ii) Ionisation Isomerism
- (b) Mention any two limitations of valence bond theory.
15. (a) Discuss the geometry and magnetic property of  $[\text{CoF}_6]^{3-}$  complex, based on valence bond theory. 4+2
- (b) What are chelating ligands ? Give an example.
16. (a) What are metal carbonyls ? Write the structure of  $\text{Co}_2(\text{CO})_8$ . 4+2
- (b) What is hapticity of a ligand ? Give an example for a dihapto ligand.
17. (a) Explain the spectral properties of  $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$  and  $[\text{Co}(\text{H}_2\text{O})_6]^{2+}$  complexes based on crystal field theory. 4+2
- (b) What is spectrochemical series ?
18. (a) Describe the manufacture of carborundum. 4
- (b) What is spalling ? How does it occur ?
19. (a) Describe the manufacture of Portland cement by Wet process.
- (b) Give the composition of LPG.



20. (a) Mention the role played by the following constituents of paints : 4+2
- (i) Medium
  - (ii) Plasticiser
  - (iii) Pigment
  - (iv) Thinner
- (b) How is Dynamite prepared ?
21. (a) Describe the manufacture of Soda glass. 4+2
- (b) What are Abrasives ? Give an example.
22. (a) What are Explosives ? How are they classified ? Give an example for each type. 4+2
- (b) What are bipropellants ? Give an example.
23. (a) Discuss the structure and biological functions of Myoglobin. 4+2
- (b) Explain the role of cyanocobalamin in living systems.
24. (a) Explain briefly Type I and II super conductors. 4+2
- (b) Write a short note on Carbon nanotubes.
25. (a) Explain Sol-gel synthesis of nanomaterials. 4+2
- (b) Mention any two applications of nanomaterials.

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