

**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+2
- (b) What is spalling ? How does it occur ?
19. (a) Describe the manufacture of Portland cement by Wet process. 4+2
- (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 **4+2** each type.
(b) What are bipropellants ? Give an example.
23. (a) Discuss the structure and biological functions of Myoglobin. **4+2**
(b) Explain the role of cyanocobalamine 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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VI Semester B.Sc. Examination, May/June - 2019

CHEMISTRY

Biochemistry-VIII

(CBCS) (F+R) (2016-17 & Onwards)

Time : 3 Hours

Max. Marks : 70

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

PART - A

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

1. Mention the contribution of the following scientists to the development of biochemistry :
(a) Han's Krebs
(b) Fredric Sanger
2. Write the Zwitter ionic structural form of glycine.
3. Define Michaelis - Menten constant. Mention its significance.
4. Write Haworth structure of B-D-galactosamine.
5. What is energy Coupling ? Give an example.
6. Mention any two termination codons.
7. Define saponification number of lipids give its significance.
8. Write the reaction of urea cycle catalysed by arginase.
9. Explain competitive inhibition, with an example.
10. What are nucleotides ? Give an example.
11. Write the structure of alanyl serine.
12. Name the forces which stabilises tertiary structure of proteins.

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**PART - B**

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

13. (a) Write the principle and applications of thin layer chromatography. **9x6=54**
(b) Write any two biological role of water. **4+2**
14. (a) Write the partial structure of glycogen, give its biological importance. **4+2**
How does it differ from starch ?
(b) Give any two biological role of Chitin.
15. (a) What are fatty acids ? Give their classification with one example in each class. **4+2**
(b) Define liposomes. Give any two applications of it.
16. (a) What are hormones ? Give the biological functions of. **4+2**
(i) Glucagon
(ii) Oxytocin
(iii) Progesterone
(b) Write a note on denaturation of proteins.
17. (a) How are amino acid classified based on polarity of side chain ? Give one example for each class. **4+2**
(b) Write a note on Primary structure of protein.
18. (a) (i) Name two aromatic amino acids. **2+2+2**
(ii) Name two hydroxyl group containing amino acids.
(b) Define Isoelectric pH. Write the ionic forms of alanine at $\text{pH}_{4.1}$.
(c) How do amino acids reacts with alcohol ?
19. Write note on the following. **2+2+2**
(a) Koshland's induced fit theory of enzyme catalysis.
(b) Effect of temperature on enzyme catalysed reaction.
(c) Active site of an enzyme.
20. (a) Calculate the number of ATP molecules produced by the oxidation of acetyl CoA in TCA cycle. **4+2**
(b) Write equation for the conversion of fumarate to malate.



21. (a) Describe the role of carnitine in the metabolism of fatty acid. **2+2+2**
(b) How is pyruvate converted in to ethanol in yeast ?
(c) Write the reaction of glycolytic path way catalysed by Aldolase.
22. (a) Why is ATP the most efficient energy molecule ? Illustrate with **4+2** structure.
(b) What is substrate level phosphorylation ? Give an example.
23. (a) Explain semiconservative mechanism of DNA replication. **4+2**
(b) What is translation ?
24. (a) Mention four salient features of Watson and Crick model of DNA. **4+2**
(b) Describe Chargaff's rule of base equivalence.
25. (a) Write a note on Chromatin. **2+2+2**
(b) What is transamination ? Give an example.
(c) Write any two applications of DNA finger printing.

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