



US – 338

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.O



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.
b) Calculate the EAN of Ni in the complex tetracarbonylnickel (O). (4+2)
(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.
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 $[\text{Pt}(\text{NH}_3)_4] [\text{CuCl}_4]$. (4+2)
15. a) Discuss the splitting of d-orbitals in tetrahedral complexes.
b) What are ligands ? Give one example for a bidentate neutral ligand. (4+2)
16. a) What are metal carbonyls ? Write the structure of $\text{Mn}_2 (\text{CO})_{10}$.
b) Explain Monsanto acetic acid process. (4+2)
17. a) Based on VBT, explain the geometry and magnetic property of $[\text{Co}(\text{NH}_3)_6]^{3+}$.
b) Calculate the effective atomic number of $\text{Cr}(\text{CO})_6$ based on 18 – electron rule. (4+2)
18. a) Describe the manufacture of portland cement by wet process.
b) Mention any two characteristics of a fuel. (4+2)
19. a) Give the composition and one application each for (i) borosilicate glass
(ii) optical glass.
b) Mention the constituents of varnishes. (4+2)
20. a) Mention the raw materials and their roles in the manufacture of ceramic wares.
b) Define octane number. (4+2)



21. a) What are explosives ? How are they classified ? Give one example for each type.
- b) Why preservatives are added to emulsion paints ? Give one example. (4+2)
22. a) Describe the manufacture of silicon carbide.
- b) Write any two applications of high temperature super conductors. (4+2)
23. a) What is myoglobin ? Discuss its biological functions.
- 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.
- b) Write a note on carbon nanotubes. (4+2)
25. a) Explain mechanical alloying method of synthesis of nanomaterials.
- b) Write a note on electrophilic aromatic substitution reaction with respect to fullerenes. (4+2)
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VI Semester B.Sc. Examination, May 2017
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CHEMISTRY

Paper – VIII : Biochemistry

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.

(8×2=16)

1. Mention the contributions of the following scientists to the development of Biochemistry :
 - i) Emil Fischer
 - ii) Francis Crick.
2. Write Haworth structure of glucose-6-phosphate.
3. What are essential amino acids ? Give two examples.
4. What is saponification value of an oil or fat ? What does it signify ?
5. What are nucleotides ? Give an example.
6. Give an example of an amino acid derivative hormone. Mention its biological role.
7. Explain energy coupling reaction with an example.
8. What is absolute specificity ? Give an example.
9. Give the principle of thin layer chromatography.
10. What is transamination ? Give an example.
11. How are fatty acids activated ? Write the equation.
12. Write the central dogma of molecular biology.

P.T.O.



PART – B

Answer **any nine** of the following questions. **Each** question carries **six** marks. (9×6=54)

13. a) Give the biochemical and elementary composition of living organisms.
b) Write the principle and applications of polyacrylamide gel electrophoresis (PAGE). (3+3)
14. a) Write the partial structure of glycogen. Give its biological importance. How does it differ from starch ?
b) What are sugar phosphates ? Name the sugar phosphate present in RNA. (4+2)
15. a) What are triglycerides ? Mention their biological importance.
b) Write the structure of lecithin. (4+2)
16. a) What are hormones ? Give the biological functions of :
i) Glucagon
ii) Vasopressin
iii) Testosterone.
b) Mention the clinical significance of Low Density Lipoproteins (LDL) and High Density Lipoproteins (HDL). (4+2)
17. a) How are proteins classified based on biological function ? Give an example for each.
b) Write the structure of proline. (4+2)
18. a) Write a note on :
i) α -helix
ii) β -pleated structure of proteins.
b) What is protein denaturation ? How is it caused ? (4+2)
19. a) Describe Watson and Crick model of DNA.
b) Write a note on chromatin. (4+2)
20. a) Write a note on :
i) Koshland's induced fit theory of enzyme catalysis
ii) Effect of pH on enzyme catalysis.
b) Write Michaelis – Menten equation and mention the terms involved. (4+2)

21. a) Explain substrate level and oxidative phosphorylation. Give an example for substrate level phosphorylation. (4+2)
b) Write a note on active site of an enzyme.
22. a) Give the schematic representation of electron transport chain. Indicate the sites of ATP synthesis. (4+2)
b) What is gluconeogenesis ?
23. a) i) Write equation for the conversion of glyceraldehyde-3-phosphate to 1,3 – di – phosphoglycerate.
ii) Give the significance of urea cycle. (4+2)
b) How is pyruvate converted into ethanol in yeast ?
24. 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.
25. a) Explain the role of the following in DNA replication
i) DNA gyrase
ii) DNA helicase.
iii) DNA ligases
iv) DNA polymerase I. (4+2)
b) What is a codon ? Write the initiation codon.
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