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VI Semester B.Sc. Degree Examination, September/October - 2022

**CHEMISTRY****Inorganic Chemistry****(CBCS Scheme 2021 Onwards (F+R))****Paper :VII****Time : 3 Hours****Maximum Marks : 70****Instructions to Candidates :**

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. Give IUPAC name of the complexes:
  - i)  $[\text{CoCl}_2(\text{en})_2]^+$
  - ii)  $\text{K}_4[\text{Fe}(\text{CN})_6]$
2. Write the geometric isomers of  $[\text{PtCl}_2(\text{NH}_3)_2]$
3. Mention two drawbacks of Valence Bond Theory.
4. Calculate the EAN of  $[\text{Pd}(\text{NH}_3)_6]^{4+}$ . Atomic number of Pd = 46.
5. What is the role of feldspar in the manufacture of ceramics.
6. Differentiate between paints and varnishes.
7. What is portland cement? Give its composition
8. How is TNT prepared?
9. Mention any Two Functions of sodium and calcium in biological processes.
10. What is the role of cyanocobalamin in living systems.
11. Give two examples of conducting polymers.
12. What are type I super conductors.

**[P.T.O.]**



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PART - B

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Answer any Nine of the following questions. Each question carries Six marks.

(9×6=54)

13. a) Write the main postulates of werner's theory of coordination compounds.  
b) State 18-electron rule. (4+2)
14. a) Using CFT, Calculate the magnetic moment of a  $d^4$  system in a strong octahedral ligand field.  
b) What are high spin complexes? Give an example. (4+2)
15. a) Give one method of synthesis of ferrocene and explain its structure.  
b) What are metal carbonyls? Write the structure of  $\text{Cr}(\text{Co})_6$ . (4+2)
16. a) Describe monsanto acetic acid synthesis.  
b) Define hapticity. Give an example of a dihapto ligand. (4+2)
17. a) Based on VBT, show the formation of inner or outer orbital complex taking  $[\text{CoF}_6]^{3-}$  and  $[\text{Co}(\text{NH}_3)_6]^{3+}$  as examples.  
b) Explain the use of  $\text{Na}_2[\text{Ca}(\text{EDTA})]$  in the treatment of heavy metal poisoning. (4+2)
18. a) How is calorific value of a fuel determined using a bomb calorimeter.  
b) Write a note on glazing of ceramic ware. (4+2)
19. a) What are refractories ? Mention the different types of refractories with an example.  
b) What are propellants ? What is meant by its specific impulse. (4+2)
20. a) Describe the manufacture of carborundum with the help of a neat diagram.  
b) What is the role of anti-skinning agent in paints. Give an example. (4+2)
21. a) Give the advantageous of gaseous fuels.  
b) Write a note on safety glass. (4+2)
22. a) What are metalloporphyrins? Give any two examples and mention their biological functions.  
b) List any four trace elements present in the human system. (4+2)



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23. a) What are fullerenes? Describe the preparation of fullerenes & isolation of C-60.  
b) Give any two applications of high temperature super conductors. (4+2)
24. a) Discuss the biological and engineering applications of conducting polymers.  
b) What are carbon nanotubes. (4+2)
25. a) Explain sol-gel synthesis of nano materials.  
b) Give the synthesis of  $Y_1Ba_2Cu_3O_{x\pm\delta}$  (4+2)
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VI Semester B.Sc. Degree Examination, September/October - 2022

**CHEMISTRY****Biochemistry**

(CBCS Scheme (F + R) 2020-2021 onwards)

**Paper : VIII****Time : 3 Hours****Maximum Marks : 70****Instructions to Candidates :**

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.
  - a) E.Chargaff
  - b) Louis pasteur.
2. Write the structure of N-acetyl-β-D- glucosamine .
3. What are essential fatty acids? Give an example.
4. Write the structure of an amino acid having two carboxyl group.
5. What are nucleotides? Give an example.
6. What is meant by 'active site' of an enzyme?
7. Name any two high energy compounds other than ATP.
8. Write the reaction of glycolysis catalyzed by phosphofructokinase.
9. Mention the biological role of insulin.
10. What is Transamination? Give an example.
11. What are Okazaki fragments?
12. Mention any two Applications of paper chromatography.

**[P.T.O.]**





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## PART - B

Answer any NINE of the following questions. Each carries Six marks. (9×6=54)

13. a) Outline properties of water which makes it a solvent of life.  
b) Write the structure of Trehalose. (4+2)
14. a) Differentiate between amylose and amylopectin of starch.  
b) Write the structure of sugar present in DNA. (4+2)
15. a) What is rancidity? Mention the types and how are they prevented.  
b) Write the structure of 3-Sn - phosphatidylcholine. (4+2)
16. a) What are lipoproteins ? How are they classified.  
b) Explain the role of C-AMP as Second messenger. (4+2)
17. a) How are proteins classified based on biological function? Give an example for each.  
b) Mention the factors stabilizing the tertiary structure of proteins. (4+2)
18. a) Mention salient features of Watson and crick model of DNA.  
b) How do amino acids react with nitrous acid? Write equation. (4+2)
19. a) Explain the effect of pH and temperature on enzyme catalysis.  
b) Write michaelis - menten equation Mention the terms involved. (4+2)
20. a) Compare the biological oxidation with combustion.  
b) Explain energy coupling reaction with an example. (4+2)
21. a) What is metabolism? Mention the phases of metabolism.  
b) What is gluconeogenesis?  
c) How is pyruvate converted to acetyl co-enzyme -A? (2+2+2)
22. a) Write chemical equation for the following reactions.  
i) Conversion of fumarate to malate.  
ii) Formation of carbamoyl phosphate.  
b) Explain transamination reaction with an example. (4+2)



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23. a) Calculate the number of ATP produced during the complete oxidation of one mole of glucose.
- b) Write the reaction catalysed by arginase. (4+2)
24. a) Write any four characteristic features of genetic code.
- b) What is the 'central dogma' of molecular biology? (4+2)
25. a) Give the principle and any two applications of electrophoresis.
- b) What is translation? (4+2)
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