VI Semester B.Sc. Examination, May/June 2018
(CBCS) (2016 – 17 and Onwards) (Fresh+Repeaters)
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 names of the following complexes :
   i) $Li[Al H_4]$
   ii) $[Co(H_2O)_6]^{3+}$.

2. Calculate the EAN of copper in $[Cu(NH_3)_4]SO_4$ (atomic number of Cu = 29).

3. State eighteen electron rule.

4. Mention two limitations of valence bond theory.

5. Name the raw materials used in the manufacture of glass.

6. Give any two advantages of gaseous fuels.

7. Define spalling. How do you minimise it ?

8. Write a note on annealing of glass.

9. Write any two applications of super conductors.

10. Write a note on carbon nanotubes.

11. What is the role of cobalamine in living systems ?

12. Give any two examples for conducting polymers.

P.T.O.

PART – B

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

13. a) Explain the crystal field splitting pattern in octahedral complexes.
    b) What are metal carbonyls ? Give an example.   **(4+2)**

14. a) Give the postulates of Werner's theory of co-ordination compounds.
    b) What is spectrochemical series ?   **(4+2)**

15. a) Based on Valence Bond Theory explain the geometry and magnetic property of $[Co(NH_3)_6]^{3+}$.
    b) Define crystal field splitting energy.   **(4+2)**

16. a) Explain the following with a suitable example :
    i) Co-ordination isomerism
    ii) Hydrate isomerism.
    b) What are high spin complexes ? Give an example.   **(4+2)**

17. a) Explain the applications of :
    i) Cis platin in cancer therapy
    ii) Wilkinson's catalyst in hydrogenation of oils.
    b) Explain the application of co-ordination compounds in monsanto acetic acid process.   **(4+2)**

18. a) Describe the manufacture of carborandum.
    b) Define hardness of an abrasive. On what scale it is expressed ?   **(4+2)**

19. a) Mention the raw materials and their role in the production of ceramic wares.
    b) What is the role of gypsum in setting of cement ?   **(4+2)**

20. a) Describe the determination of calorific value of a fuel using Bomb calorimeter.
    b) How is dynamite manufactured ?   **(4+2)**

P.T.O.

21. a) What are explosives ? How are they classified ? Give an example for each.

    b) Give the characteristics of a good propellant.   **(4+2)**

22. a) Discuss the structure of Myoglobin and its biological function.

    b) What is the role of sodium and calcium in biological systems ?   **(4+2)**

23. a) Discuss the biological and engineering applications of conducting polymers.

    b) Give the preparation of $Y_1 Ba_2 Cu_3 O_x$.   **(4+2)**

24. a) Explain Solgel method of synthesis of nanomaterials.

    b) What are superconductors ?   **(4+2)**

25. a) What are fullerenes ? Describe the preparation of fullerenes and isolation of C-60.

    b) Explain the bromination of fullerenes.   **(4+2)**

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VI Semester B.Sc. Examination, May/June 2018
(CBCS) (Fresh + Repeaters) (2016-17 and Onwards)
Paper – VIII : CHEMISTRY
Biochemistry

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. **(8×2=16)**

1. Mention the contributions of the following scientists to the development of biochemistry.
    i) Louis Pasteur
    ii) Hans Kreb.

2. Write the Haworth structure of N-acetyl β-D-glucosamine.

3. Write the structure of Lysine.

4. Define saponification number. Give its significance.

5. What are allostearic enzymes ? Give an example.

6. Give the structure of a nucleotide present only in RNA.

7. Give the principle of electrophoresis.

8. Explain energy coupling in biological systems with a suitable example.

9. What is glycolysis ?

10. Explain group specificity with an example.

11. Write the structure of glycylalanine.

12. What are liposomes ? 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) Discuss the properties of water which makes it the solvent of life.

    b) Give the principle of thin layer chromatography. Mention two applications.   **(3+3)**

14. a) Name the storage polysaccharide present in animals and give its partial structure. How does it differ from amylopectin ?

    b) Write the structure of α-D-fructose 1, 6-diphosphate.   **(4+2)**

15. a) i) Write the structure of phosphatidyl choline.

       ii) Mention the biological functions of phospholipids.

    b) Give the biological role of HDL and LDL cholesterol.   **(4+2)**

16. a) Explain renaturation of protein in Aufinsen's experiment with ribonuclease.

    b) Name the forces that stabilizes tertiary structure of a protein.   **(3+3)**

17. a) How does the following factors affect rate of enzyme catalyzed reaction ?

       i) Effect of pH.

       ii) Effect of substrate concentration.

    b) Define active site of an enzyme.   **(4+2)**

18. a) How are proteins classified based on biological functions ?

    b) Give the reaction of an amino acid with alcohol.   **(4+2)**

19. a) Write any one irreversible step of the glycolytic pathway.

    b) How is pyruvate activated prior to its entry into the TCA cycle ?

    c) Calculate the total ATP produced by the complete oxidation of palmitic acid.   **(2+2+2)**

20. a) Give the structural features of ATP, which makes it a high energy molecule.

    b) Explain substrate level phosphorylation with a suitable example.   **(3+3)**

21. a) What are hormones ? How are they classified ? Give one example each.

    b) Explain hormonal action mediated by cyclic AMP.   **(4+2)**

22. a) How are amino acids classified based on polarity of side chain ?

b) Explain primary structure of a protein. **(4+2)**

23. a) Mention four salient features of Watson and Crick model of DNA.

b) Give the protein nucleic acid interaction in chromatin. **(4+2)**

24. a) Give the structure of two purine bases present in nucleic acids.

b) Write the enzymatic reaction for the conversion of malate to oxaloacetate. **(4+2)**

25. a) Explain briefly the mechanism of DNA replication.

b) Define translation. **(4+2)**

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