(Pages : 4) K - 3166

Reg. No. : .....

Name : .....

ALL SAINTS COLLEGE TRIVANDRUM

Fifth Semester B.Sc. Degree Examination, February 2021

First Degree Programme under CBCSS

Core Course

Chemistry

CH 1542 : INORGANIC CHEMISTRY III

(2013, 2015-2016 Admission)

Time : 3 Hours Max. Marks : 80

PART – A

Answer **all** questions. Each question carries **one** mark.

1. Which is coloured, solution of $TiCl_3$ or $TiCl_4$? Justify your answer.
2. Which is stabler Cu^+ or Cu^{2+} ? why?
3. What is the hybridization and geometry of the complex $[Pt(NH_3)_4]^{2+}$?
4. What are carboranes? Give one examples.
5. How is silicon rubber prepared?
6. Give any one application of coordination compounds in qualitative analysis.
7. What are the important raw materials used for the preparation of glasses.
8. Give two examples of phosphorous based polymers.

P.T.O.

9. What is Bohr effect?

10. What are LNCC? Give one example.

(10 × 1 = 10 Marks)

PART – B

Answer any **eight** questions. Each question carries **2** marks

11. Why do Zr and Hf display similar properties?

12. Tetrahedral complexes are high spin. Justify?

13. Find out the hybridisation, geometry and predict the magnetic property of the complex $[Co\ F_6]^{3+}$.

14. Explain why $[Fe\ (H_2O)_6]^{3+}$ ion is more paramagnetic than $[Fe\ (CN)_6]^{3-}$.

15. What are labile and inert complexes?

16. Give the geometry and the structure of the compound ClF_3.

17. Draw the structures of XeF_2 and XeF_4.

18. Give one method of preparation of $Ni(CO)_4$.

19. What are pseudo halide ions? Give one example.

20. Calculate EAN of the central atom in the following.

    (a) $K_4[Fe(CN)_6]$

    (b) $[Pt(NH_3)_6]^{4+}$

21. Boron nitride resembles graphite. Comment on this statement.

22. Explain the function of Na-K pump in biological process.

(8 × 2 = 16 Marks)

PART – C

Answer any **six** questions. Each question carries **4** marks.

23. Explain the behavior of the oxidizing agent $KMnO_4$ in acidic, basic and neutral solution.
24. Briefly discuss the characteristics of d block elements.
25. What are high spin and low spin complexes? Explain with examples.
26. Illustrate stereo isomerism in coordination compounds using example.
27. Explain the diamagnetic property of ferrocene on the basis of valence bond theory.
28. Explain the role of hemoglobin and myoglobin in biological system.
29. Describe the bonding in metal-alkene complexes.
30. Write a short note on zeolites.
31. Discuss about silicon based polymers.

(6 × 4 = 24 Marks)

PART – D

Answer any **two** questions. Each question carries **15** marks.

32. Compare lanthanides and actinides based on

    (a) Electronic Configuration

    (b) Oxidation states

    (c) Magnetic Properties

    (d) Spectral properties

33. (a) Explain sigma bonding of octahedral complexes using Molecular Orbital Theory.

(b) Draw Molecular orbital diagram for $[Co(NH_3)_6]^{3+}$ and predict its magnetic property.

34. Define organometallic compounds. Discuss its classification in detail with example for each class.

35. Discuss preparation, properties and bonding in Diborane.

(2 × 15 = 30 Marks)
