(Pages : 4) **K – 3307**

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TRIVANDRUM

Fifth Semester B.Sc. Degree Examination, February 2021

First Degree Programme Under CBCSS

Chemistry

Core Course

CH 1542 : INORGANIC CHEMISTRY – III

(2018 Admission – Regular)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Each question carries **1** mark (Answer in a word/sentence)

1. Write the formula of sodium tetrafluoridosilicate (IV).
2. Name the energy carriers in photosynthesis.
3. Give an example of heteroleptic metal carbonyl.
4. Among the 3d transition elements which metal has highest number of unpaired electrons in the ground state?
5. Name the most basic hydroxide among lanthanide hydroxides.
6. ———— process is used for the purification of nickel.
7. Where do we obtain the magnified image of the specimen in TEM?
8. Crude titanium is purified by ———— method.

P.T.O.

9. What is the coordination number and oxidation state of central metal ion in $K_3[Fe(Ox)_3]$.

10. Give an example of hexahapto ligand.

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions. Each question carries **2** marks. (short answer questions)

11. Distinguish between ore and mineral with examples.

12. Write the IUPAC names of

    (a) $[Co(NH_3)_5Cl]Cl_2$

    (b) $K_2[Pt(SCN)_6]$

13. What is EAN rule? Check whether $(Ag(CN)_2]^-$ is obeying EAN rule or not. (At. No. of Ag -47)

14. Transitional metal ions form a number of nonstoichiometric compounds. Give reasons.

15. Why do actinides form complexes more readily than lanthanides?

16. Give two uses of potassium dichromate in the lab.

17. What is meant by coordination isomerism? Explain with example.

18. Differentiate between mononuclear and polynuclear metal carbonyls with examples.

19. What are bulk and trace metal ions? Give examples.

20. Explain how IR spectroscopy is helpful in finding the structure of metal carbonyls.

21. What is the principle of AFM?

22. Mention the differences between haemoglobin and myoglobin.

23. Mention the differences between SEM and TEM.

24. Explain why crystal field splitting in tetrahedral field is less than splitting in octahedral field.

25. Differentiate between calcination and roasting.

26. What is meant by aluminothermy?

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions. Each question carries **4** marks. (Short essay questions)

27. What is meant by hydrometallurgy? Explain with an example.

28. Discuss any four general characteristics of transition metals in detail.

29. Briefly discuss the biochemical processes in which Fe is involved.

30. Describe the bonding in metal carbonyls.

31. Write a note on spectrochemical series.

32. Explain the crystal field splitting in an octahedral field.

33. Briefly discuss applications of organometallic compounds.

34. Discuss instrumentation involved in TG.

35. Briefly compare the similarities between lanthanides and actinides.

36. What is meant by chelate effect? Why it is called as an entropy effect?

37. Explain froth flotation process.

38. Distinguish between labile and inert complexes with examples.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. Each question carries **15** marks. (essay questions)

39. Write an account of the MOT of octahedral complexes taking $[Co(NH_3)_6]^{3+}$ as example.

40. What is lanthanide contraction? Discuss the causes and consequences.

41. Discuss the principle and instrumentation of colorimetry.

42. Discuss the bonding involved in Zeise's salt and its structure.

43. Briefly explain the steps involved in photosynthesis.

44. Discuss the extraction of iron from haematite.

(2 × 15 = 30 Marks)
