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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2021

First Degree Programme Under CBCSS

Chemistry

CH 1542 : INORGANIC CHEMISTRY III

(2018 and 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** (answer in **one** word/sentence)

1. Give the electronic configuration of Cr^{3+}.

2. What are the uses of $TiCl_4$?

3. What is EAN?

4. What are chelates? Give one example.

5. Give one example for poly-nuclear carbonyl complex.

6. Define Froth floatation process.

7. What is the basic principle used in colorimeter?

8. What is the source of radiation used in electron microscopes?

P.T.O.

9. State Beer-Lamberts law.

10. What is liquation?

(10 × 1 = 10 Marks)

SECTION – B

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

11. Explain Lanthanide contraction.

12. Explain the reason for the colour of transition metal complex.

13. Give one method for the isolation of lanthanide form monazite.

14. What is crystal field stabilisation energy?

15. What are labile complex? Give Example.

16. Give one example for complex showing optical isomerism.

17. What is aluminothermy process?

18. What are cytochromes?

19. Give any two functions of myglobin?

20. What is zone refining?

21. What is inorganic graphite?

22. Give any two name and formula of ores of Al?

23. What is the use of thermogravimetry analysis?

24. Explain the basic principle of XRD?

25. Check whether the complex $[Co(NH_3)_6]Cl_3$ obeys 18 electron rule.

26. What is pi back bonding in complex?

(8 × 2 = 16 Marks)

SECTION – C

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

27. Explain the variation of ionisation enthalpy across 3d series?

28. Write a short note on magnetic properties of transition metal complex.

29. What is spectrochemical series?

30. What is CFSE? Calculate the CFSE for Cr^{2+} in high spin and low spin complexes?

31. Explain the ligand substitution S_N1 and S_N2 reactions.

32. Explain the bonding in Zeise's Salt.

33. Explain the Vibrational frequency variation of CO group in metal carbonyls? Draw the structure of $Fe_2(CO)_9$.

34. Give a short note on biochemistry of Magnesium and Calcium.

35. Purification of crude metals by Mouds process and Van Arkel Process.

36. What is the difference between roasting and calcination?

37. Explain various steps involved in the purification process of Al from its ore.

38. What do you mean by vapour phase refining?

(6 × 4 = 24 Marks)

SECTION – D

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

39. Explain the thermal methods TG & DTA for the characterisation of materials. Give detail discussion of instrumentation of TG and what are its applications.

40. (a) Explain Jahn-Teller effect with examples.

    (b) Explain the application of coordination compounds in quantitative and qualitative analysis.

41. Explain the biochemistry of haemoglobin and myoglobin.

42. Explain the Metallurgical process of Iron.

43. Write down a comparative study on oxidation state, ionic radii, colour, contraction of Lanthanides and Actinides.

44. Explain the instrumentation and applications of SEM and TEM.

(2 × 15 = 30 Marks)

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