R – 3152

Reg. No. : ....

Name : ....

Second Semester B.Sc. Degree Examination, September 2023

First Degree Programme under CBCSS

Chemistry

Complementary Course for Zoology

CH 1231.4 : INORGANIC CHEMISTRY

(2020 Admission Onwards)

Time : 3 Hours   Max. Marks : 80

SECTION – A

Answer **all** questions.   Answer in one word to maximum two sentences. Each question carries **1** mark.

1. Among the three radioactive rays, which possess the least ionizing power?

2. What is the general formula of Grignard reagent?

3. What is the half-life period of U^{238} isotope?

4. When a nuclide decays by β–emission, what happen for its N/P ratio?

5. Give any two examples for organosilicon compounds.

6. What is a heme protein?

7. Which macromolecule serves as the oxygen storage in muscle cells?

8. What is meant by trace elements in biological systems?

P.T.O.

9. Name the indicator used for Zn^{2+} vs EDTA titration.

10. Give any two examples for low spin complexes.

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(10 × 1 = 10 Marks)

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SECTION – B

Short answer type. Answer any **eight** questions. Each question carries **2 marks**.

11. What are metallocenes? Explain.

12. Distinguish between natural and artificial radioactivity.

13. State Geiger-Nuttal rule.

14. Explain the term binding energy.

15. Give a method for the preparation of organomercury compounds.

16. What is respiration. Explain.

17. Name any two metalloporphyrins and mention the metal ions present in them.

18. Mention the difference between haemoglobin and myoglobin.

19. Distinguish between inner orbital and outer orbital complexes.

20. What is chelation?

21. Explain carbon fixation and carbon cycle.

22. Define the critical mass of a fissile material.

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(8 × 2 = 16 Marks)

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SECTION – C

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

23. Write a note on nuclear stability and n/p ratio.

24. Discuss the environmental aspects of organometallic compounds.

25. What is mass defect? Calculate energy released in the following reaction.

$_{92}U^{235} + _0n^1 \rightarrow _{56}Ba^{141} + _{36}Kr^{92} + 3_0n^1$.   [Atomic   mass   (in   amu)   of $U^{235} = 235.044$, $Ba^{141} = 140.908$, $Kr^{92} = 91.905$ and mass of $_0n^1 = 1.009$].

26. Write a note on biochemistry of iron toxicity and nutrition.

27. Discuss about the methods of preparation and synthetic applications of organoboron reagents.

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28. Discuss the structural features and functions of myoglobin.

29. Discuss the magnetic properties of tetrahedral and octahedral complexes with suitable examples.

30. Discuss the colour of transition metal complexes.

31. Calculate the spin only magnetic moment of $[Fe(CN)_6]^{3-}$ and $[Fe(H_2O)_6]^{3+}$.

(6 × 4 = 24 Marks)

SECTION – D

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

32. Discuss about the structural and stereo isomerism exhibited by coordination compounds.

33. Write a note on

   (a) Structure of hemoglobin and its role in the transport of dioxygen and carbon dioxide.

   (b) Cytochromes.

34. Describe briefly

   (a) Radioisotopes as tracers.

   (b) Nuclear fission.

   (c) Rock dating.

35. Explain

   (a) Classification of organometallic compounds.

   (b) Preparation and synthetic applications of Grignard reagents.

(2 × 15 = 30 Marks)

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