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T – 3236

Reg. No. : .....

Name : .....

Second Semester B.Sc. Degree Examination, August 2024

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. What type of nuclear process is responsible for the energy production in sun and stars?

2. What is meant by an organometallic compound?

3. Give any one example for organometallic compound used in medicine.

4. How many haeme units does the myoglobin molecule contain?

5. Who discovered natural radioactivity?

6. What is the common name of the complex $(\eta^5–C_5H_5)_2Fe$?

7. What is the denticity of EDTA ligand?

P.T.O.

8. Name the most abundant transition metal in human body.

9. Give any two examples for chelating ligands.

10. What is the IUPAC name of potassium ferricyanide?

(10 × 1 = 10 Marks)

SECTION – B

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

11. What is artificial radioactivity?

12. Among the metal carbonates and metal carbonyls, which is an organometallic compound and why?

13. Explain the term binding energy.

14. What is meant by half-life period of a radio isotope?

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

16. Define the critical mass of a fissile material.

17. Explain why zinc complexes are generally colourless?

18. What are cytochromes? How they are classified?

19. What are the factors which determine nuclear stability?

20. What are chelates? Explain.

21. What do you mean by nuclear chain reaction? Explain.

22. Explain nitrogen fixation.

(8 × 2 = 16 Marks)

SECTION – C

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

23. A freshly cut piece of wood gives 16100 counts of β-ray emission per minute per kg and an old wooden bowl gives 13200 counts per minute per kg. Calculate the age of the old wooden bowl. [The half-life period of ^{14}C is 5568 years.]

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

25. Write a note on the application of radioisotopes as tracers?

26. Explain the classification of organometallic compounds.

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

28. Explain the bonding in tetrahedral complexes using valence bond theory.

29. Explain the mechanism of O_2 transportation by haemoglobin.

30. Discuss the magnetic properties of tetrahedral and octahedral complexes.

31. Discuss the colour of transition metal complexes.

(6 × 4 = 24 Marks)

SECTION – D

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

32. Describe briefly

    (a) Nuclear fusion.

    (b) Nuclear stability and N/P ratio.

    (c) Neutron activation analysis.

33. Discus about the preparation and applications of organometallic compounds of Li, Hg and Fe.

34. Discuss

(a) Applications of coordination compounds in qualitative and quantitative analysis.

(b) Drawbacks of valence bond theory of complexes.

35. Write a note on

(a) Essential and trace elements in biological systems.

(b) Metalloporphyrins

(2 × 15 = 30 Marks)
