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Reg. No. : .....

Name : .....

Second Semester B.Sc. Degree Examination, December 2021

First Degree Programme Under CBCSS

Chemistry

Complementary Course

CH 1231.3/CH 1231.4/CH 1231.7 : INORGANIC AND BIOINORGANIC CHEMISTRY

(Common for Botany/Zoology/Microbiology)

(2017–2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. **Each** question carries **1** mark.

1. What is the hapticity of cyclopentadienyl anion in ferrocene?
2. When a nuclide decays by β–emission, what happen for proton number?
3. What is the oxidation state of iron in haemoglobin?
4. Give an example for a bidentate ligand.
5. What is the half-life period of U^{238} isotope?
6. Give an example for a pair of isobars.
7. What is meant by binding energy?

P.T.O.

8. Give an example for a π-bonded organometallics.

9. What is a nitrogen fixing plant?

10. Complete the reaction : $(CH_3)_2CO + RMgBr \rightarrow$

(10 × 1 = 10 Marks)

SECTION – B

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

11. What is a nuclear reactor?

12. What are essential elements?

13. State and explain Geiger-Nuttal rule.

14. Give a method for the preparation of orgnoboron compound.

15. What is artificial transmutation?

16. What are organometallic compounds?

17. Define coordination number. What is the coordination number of Ti in $[Ti(H_2O)_5Br]^{2+}2Br^-$.

18. What are the uses of orgnosilicon compounds?

19. What is photosynthesis?

20. What are high spin complexes? Give an example.

21. What is the function of cytochromes?

22. Explain why TiO_2 is colourless.

(8 × 2 = 16 Marks)

SECTION – C

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

23. Explain neutron activation analysis.

24. Write a note on the applications of organometallics in medicine.

25. Explain nuclear fission reaction with a suitable example.

26. Compare the structures of hemoglobin and myoglobin.

27. Discuss the applications of organometallics in agriculture.

28. Write a note on carbon fixation.

29. Explain the applications of metal complexes in qualitative analysis.

30. What are the main postulates of VB theory of coordination compounds?

31. Explain the stereo isomerism exhibited by co-ordination complexes.

(6 × 4 = 24 Marks)

SECTION – D

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

32. Discuss the colour and magnetic properties of transition metal complexes.

33. Discuss the mechanism of $O_2 - CO_2$ transportation.

34. Write a note on :

    (a) Artificial radioactivity

    (b) Rock dating

    (c) Group displacement law.

35. Explain the preparation and synthetic applications of Grignard reagent.

(2 × 15 = 30 Marks)