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Reg. No. : .....

Name : .....

First Semester B.Sc.. Degree Examination, June 2022

First Degree Programme under CBCSS

Chemistry

Complementary Course I for Botany/Zoology/Microbiology

CH 1131.3/CH1131.4 : THEORETICAL CHEMISTRY

(2013-2016 Admission)

Time : 3 Hours Max. Marks : 80

PART – A

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

1. Define Hund' s rule of multiplicity.
2. Write one example for an organometallic compound used as reagent.
3. Write one example for SP hybridisation.
4. What are organoboron compounds?
5. What is meant by normality?
6. Find the correct weight required to prepare 1 M 1 Litre NaOH solution.
7. Name the indicator used in dichrometric titration.

8. What is the titrant in complexometric titration?

9. Write any two series in hydrogen spectrum.

10. Define Fajan's rule.

(10 × 1 = 10 Marks)

PART – B

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

11. Explain Born-Haber cycle.

12. Explain quinanoid theory of acid-base indicator.

13. Explain the term Molarity.

14. Explain Paulis exclusion principle.

15. Write the Schrodinger wave equation and explain the terms.

16. What are organomercury compounds?

17. Explain dsp2 hybridisation with example.

18. Define bond order.

19. Give the electronic configuration of Copper (Z= 29).

20. What is meant by Lanthanide contraction?

21. Comment on the shape of ammonia molecule and its bond angle.

22. What are antitumour drugs?

(8 × 2 = 16 Marks)

PART – C

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

23. Discuss the limitations of Bohr Theory.
24. What are quantum numbers? Discuss their significances.
25. Calculate the ground state electronic energy of a hydrogen atom.
26. Write short note on complexometric titrations.
27. Explain the formation of molecular orbitals by LCAO method with an example.
28. Write short note on redox indicators.
29. Give a brief review of molecular orbital approach.
30. Explain different types of hydrogen bonding in molecules.
31. Comment on stability of half-filled and completely filled orbitals.

(6 × 4 = 24 Marks)

PART – D

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

32. (a) Discuss the various rules regarding electronic configuration.
    (b) Describe the atomic spectrum of hydrogen with neat diagram.
33. (a) Explain the theory on acid-base redox indicators.
    (b) Explain VSEPR theory.
34. What is meant by hybridization? Deduce the hybridization and geometries of IF_7 and NH_3.
35. Explain out-line for the preparation and uses of organosilicon and organoarsenic compounds.

(2 × 15 = 30 Marks)
