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H – 2090

Reg. No. : .....

Name : .....

First Semester B.Sc. Degree Examination, November 2019

First Degree Programme under CBCSS

Complementary Course I for Botany/Zoology/Microbiology

CH 1131.3/CH 1131.4/CH 1131.7 – THEORETICAL CHEMISTRY

(2017 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION - A

Answer **all** questions. Answer in **1** word to maximum **2** sentences. Each question carries **1** mark :

1 Define Beer-Lambert law.

2 Name one indicator used in dichrometric titration.

3 What is meant by bond order?

4 Give examples for sp^3 and sp^2 hybridisation.

5 What is Lattice energy?

6 What is BOD?

7 What is the cause for ozone layer depletion?

P.T.O.

9 How will you prepare 1M Na_2CO_3 solution?

10 Define molality.

11 Write Schrodinger wave equation.

(10 × 1 = 10 Marks)

SECTION – B

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

11 What are redox indicators?

12 Explain iodometric reaction.

13 Calculate the bond order of NO^+.

14 Discuss Fajan's rule suggesting example.

15 Briefly discuss the shapes of molecules with sp and sp^3 hybridisation.

16 What is meant by normality and molarity?

17 What is greenhouse effect?

18 How ozone formed in atmosphere?

19 How the use of fertilizers causes water pollution?

20 Explain Pauli's exclusion principle.

21 What is the process of electrodialysis?

22 Distinguish between primary and secondary standard.

(8 × 2 = 16 Marks)

SECTION - C

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

23. Discuss the Bohr theory. Describe its merits.

24. Write a short note on types of hydrogen bonding.

25. Discuss the permanganometric titration using suitable example.

26. Explain estimation of phosphate by colorimetric method.

27. Describe Born-Haber cycle taking suitable example.

28. Write a short note on pollution caused by agricultural activities.

29. Explain how ionic bond shows covalent character.

30. Explain bond order and bond distance taking suitable example. How it serves to determine stability of a bond.

31. Explain VSEPR theory.

(6 × 4 = 24 Marks)

SECTION - D

Essay. Answer **any two** question from the following. Each question carries **15** marks :

32. (a) Explain various types regarding electronic configuration.

(b) Illustrate atomic spectrum of hydrogen and on its spectral frequency.

33. (a) Explain hybridisation schemes taking (i) SF_6 (ii) PCl_5 (iii) BF_3 a examples.

(b) Discuss four types of quantum numbers and its significance.

34 (a) Briefly explain three methods of treatment of industrial waste water.

(b) Describe dichrometric method using suitable example.

35 Explain the theory of acid-base titrations.

(2 ⁄ 15 = 30 Marks)