

Reg. No. : .....

Name : .....

**Fourth Semester B.Sc. Degree Examination, July 2019**  
**(Career Related First Degree Programme Under CBCSS)**

**Group 2(a) : Biochemistry and Industrial Microbiology**

**Complementary Course IV**

**CH1431.7 BIOINORGANIC AND ELECTRO CHEMISTRY**

**(2013 Admn. Onwards)**

Time : 3 Hours

Max. Marks : 80

**SECTION – A**

Answer all questions. Each question carries 1 mark.

1. Give an example for ambidentate ligand.
2. General outer electronic configuration of transition element is .....
3. The hetero cyclic ring in hemoglobin known as .....
4. State Faraday's law.
5. What is equivalence point?
6. What is Calomel electrode?
7. What is Electrochemical Series?
8. What is base peak?

9. What is anti Markownikoff's rule?

10. What is Saytzeff's rule?

(10 × 1 = 10 Marks)

### SECTION – B

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

11. Explain the difference between a double salt and a complex with suitable example.

12. Explain the EAN rule with suitable example.

13. What is the difference between hemoglobin and myoglobin?

14. Explain cooperativity effect in hemoglobin.

15. What is the effect of dilution on the conductivity with examples?

16. How many hours does it take to reduce 3 mol of  $\text{Fe}^{3+}$  to  $\text{Fe}^{2+}$  with 2.0 ampere current?

17. Calculate the single electrode potential for copper metal in contact with 0.15M  $\text{Cu}^{2+}$  solution.  $E_0$  for copper is 0.34V.

18. Which are the four types of reversible electrodes?

19. What is Mc-Lefferty rearrangement?

20. How are relative intensities calculated in Mass spectroscopy?

21. Compare the mechanism of nitration and sulphonation of benzene.

22. What is the effect of structure of  $\text{S}_{\text{N}}1$  and  $\text{S}_{\text{N}}2$  mechanism?

(8 × 2 = 16 Marks)

## SECTION – C

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

23. Explain with suitable example outer-orbital co-ordination compounds and inner-orbital co-ordination compounds.
24. On the basis of VBT how will you explain that  $[\text{Ni}(\text{NH}_3)_4]^{2+}$  is tetrahedral while  $[\text{Ni}(\text{CN})_4]^{2-}$  is square planar.
25. Write a note on nitrogen fixation.
26. Explain Moving boundary method for the determination of transport number.
27. Derive a relationship between EMF and Equilibrium constant in a cell reaction.
28. Describe standard hydrogen electrode. Explain the effect of electrolyte concentration on electrode potential.
29. Give the structure of a compound  $\text{C}_{10}\text{H}_{12}\text{O}$ , whose mass spectra shows  $m/z$  values of 15, 43, 57, 91, 105, 148.
30. Write a note on aromatic nucleophilic substitution.
31. Differentiate between E1 and E2 mechanism in elimination reactions.

(6 × 4 = 24 Marks)

## SECTION – D

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

32. Explain VBT with suitable examples. How does VBT explain the magnetic properties of complexes?
33. Write a note on: (a) Carbon fixation (b) Biochemistry of Iron.
34. Write a note on instrumentation of Mass spectroscopy and fragmentation pattern of alkanes, cyclo alkanes, saturated alcohols, aliphatic ketones etc.
35. Explain the mechanism of electrophilic addition of hydrogen halides of Carbon-Carbon double bond.

(2 × 15 = 30 Marks)