B. Sc. DEGREE END SEMESTER EXAMINATION : MARCH 2023
SEMESTER 2 : CHEMISTRY
COURSE : **COURSE : 19U2CRCHE02: THEORETICAL AND INORGANIC CHEMISTRY II**
(For Regular - 2022 Admission and Improvement / Supplementary – 2021/2020/2019 Admissions)

Time : Three Hours   Max. Marks: 60

PART A
Answer All (1 mark each)

1. What is the bond order of NO molecule
2. What is Lowry-Bronsted theory of acids and bases?
3. Give the auto-ionisation of liq.SO_2
4. Name a molecule which is described as **T** shape and mention the hybridization of central atom in it.
5. What do you mean by Effective nuclear charge?
6. Iron is estimated gravimetrically as ....
7. Oxygen molecule is paramagnetic. Why?
8. Does water have a zero or non zero dipole moment? Why?

                                                                                        (1 x 8 = 8)

PART B
Answer any 6 (2 marks each)

9.   Explain how a mixture of naphthalene and urea can be separated.
10. Explain with an example, redox reaction in liq.HF as solvent.
11. How does atomic radi vary in general across a period and down the group?
12. Mention the important differences between ionic and covalent compounds.
13. Explain the non-existence of helium diatomic molecule
14. Distinguish between σ MO's and π MO's.
15. What are the limitations of Lewis theory of acids and bases?
16. How would you interpret that all the C-H bonds of methane are identical?

                                                                                        (2 x 6 = 12)

PART C
Answer any 4 (5 marks each)

17. Discuss the linear combination of atomic orbitals that give rise to MO's with pictorial representations.
18. Write a note on the factors affecting the solubility of ionic compounds.
19. Explain why PCl_5 is trigonal bipyramidal whereas IF_5 is square pyramidal.
20. Give an account for any five unusual properties of water due to hydrogen bonding

21. Discuss in detail the classification of Non-Aqueous solvents.

22. What is Electron affinity? Write any two factors on which Electron affinity of an element depends? How does Electron affinity vary in general across a period and down the group?

(5 x 4 = 20)

PART D
Answer any 2 (10 marks each)

23. What is ion polarization? Discuss in detail Fajan's rule and its applications.

24. Explain any five different chromatographic methods.

25. Explain the nature of bonding occur in metals on the basis of Free electron theory. What are the limitations of the theory

26. Discuss the different factors which affect the strength of acids and bases.

(10 x 2 = 20)