Reg No:.....
Name :.....

First Semester FYUGP Chemistry Examination NOVEMBER 2024 (2024 Admission onwards) KU1DSCCHE115 (BASICS OF STRUCTURAL and ANALYTICAL CHEMISTRY)

(DATE OF EXAM: 4-12-2024)

Time : 90 min | Maximum Marks : 50

Part A (Answer any 6 questions. Each carries 2 marks)

1. Why does the hydrogen spectrum consist of different series of lines? 2
2. What are the n, l and m values for an electron in the 2s orbital? 2
3. Why is the electron affinity of beryllium almost zero? 2
4. Why does fluorine have a lower electron affinity than chlorine? 2
5. Draw and explain the molecular geometry of NH_3 using VSEPR theory. 2
6. Define coordination compounds with an example. 2
7. What is normality and write expression to find the normality? 2
8. Write a simple first aid in the case of a fire accident from laboratory. 2

Part B (Answer any 4 questions. Each carries 6 marks)

9. What are the postulates of the Bohr atom model and explain hydrogen spectrum based on it? 6
10. What are transition elements? Discuss their general characteristics. 6
11. a) Describe the shape and bond angles in methane.
    b) Explain the shape of ethane and how it differs from ethylene. 6
12. Explain the factors that affect the stability of coordination compounds. 6
13. What is the difference between accuracy and precision in the context of measurement? 6
14. What are the rules while handling chemicals and write first aid steps for heat burn? 6

Part C (Answer any 1 question(s). Each carries 14 marks)

15. (a) On the basis of VBT, account for the fact that $[Ni(CN)_4]^{2-}$ is diamagnetic and square planar while $[NiCl_4]^{2-}$ is paramagnetic and tetrahedral. 7
    (b) Discuss the application of complexes in analytical chemistry. 7

16. (a) Apply VSEPR theory to predict the shapes of the following molecules: NH_3, PCl_5, SF_6, and ClF_3. 7
    (b) Compare and contrast valence bond theory and molecular orbital theory using H_2, C_2, and B_2 as examples. 7