

University of Information Technology & Sciences (UITSS)
Faculty of Science and Engineering
Department of CSE/IT
Mid-Term Examination, Spring-2024
Course Title: Engineering Chemistry
Course Code: CHEM- 175

Marks: 20

Time: 1 Hour

Answer all the questions. Assume necessary data/values if missing

1. (a) State and explain Hund's rule with proper example. 2

(b) Do you think that Bohr's atomic model could overcome the limitations of Rutherford's atomic model? Discuss briefly with the postulates of Bohr's atomic model to justify your answer. 4

(c) Provide electronic configuration of $_{12}\text{Mg}$, $_{21}\text{Sc}$, $_{24}\text{Cr}$, $_{26}\text{Fe}$, $_{29}\text{Cu}$, and $_{30}\text{Zn}$. List the d-block and transition metals from these elements? 4

2. (a) Explain the periodic trend of ionization potential and atomic radius of atoms. 2

(b) Explain why all four quantum numbers are important to determine a particular electron in a specific orbital. Indicate and explain which of the following sets of quantum numbers are unacceptable for an electron; (a) $[1, 0, 1, \frac{1}{2}]$; (b) $[3, 0, 0, \frac{1}{2}]$; (c) $[2, 2, 1, \frac{1}{2}]$; (d) $[3, 2, 1, 1]$. 5

(c) Draw the orbital diagram of d_{xy} and d_{z^2} . Why d-block elements form colored compound. 3