



**Daffodil**  
International  
University

Department of Nutrition and Food Engineering  
Faculty of Health and Life Sciences  
BSc. in Nutrition and Food Engineering  
Midterm Examination Fall 2025

Course Code: 0531-1103  
Level and Term: L-1, T-1  
Time: 1 hour 30 minutes

Course Title: Physical, Inorganic and Analytical Chemistry  
Course Teacher Initials: DNU, DAMR, DZI  
Total Marks: 25

Section: 253 All  
Splitting any answer is strictly prohibited

- |   |  |                  | Marks |
|---|--|------------------|-------|
| 1 | (a) Write the symbols of all alkali and alkaline-earth metals.   | [CLO1; PLO1; C2] | 2     |
|   | (b) How i) ionization energy ii) electronegativity and iii) atomic radius changes across <u>period-2</u> in periodic table?  | [CLO1; PLO1; C1] | 3     |
| 2 | (a) Write down the electronic configuration of the following elements: (i) Fe (ii) Cu.   | [CLO1; PLO1; C3] | 1+1   |
|   | (b) What are <u>isotopes</u> , <u>isobars</u> , and <u>isotones</u> ? Give an example for each of them.  | [CLO1; PLO1; C2] | 3     |
| 3 | (a) What are the differences between <u>ionic</u> and <u>covalent bond</u> ?   | [CLO1; PLO1; C1] | 2     |
|   | (b) Define Hydrogen Bonding. Explain the types of Hydrogen Bonding with examples.  | [CLO1; PLO1; C3] | 3     |
| 4 | (a) How many molecules are present in 15g of CO <sub>2</sub> ?   | [CLO2; PLO1; C3] | 2     |
|   | (b) A 500mL solution has 40g substance dissolved in it, and its molarity is 0.75. What is the molecular <u>mass</u> of the solute in the solution?   | [CLO2; PLO1; C3] | 3     |
| 5 | (a) Determine the Oxidation State of the central atom of the following compounds: i) P in Na <sub>3</sub> PO <sub>3</sub> (ii) B in NaBH <sub>4</sub> (iii) Cr in K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> (iv) P in H <sub>3</sub> PO <sub>4</sub> . | [CLO2; PLO1; C3] | 2     |
|   | (b) The percent composition of a compound is C=92.31%, H=7.69%. When molecular mass of the compound is 78, determine its molecular formula.  | [CLO2; PLO1; C3] | 3     |