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| ……**DEPARTMENT OF CHEMISTRY**  **FOURAH BAY COLLEGE – UNIVERSITY OF SIERRA LEONE** CHEM 122INTRODUCTION TO GROUP CHEMISTRY AND NUCLEAR CHEMISTRY**Unit 1 – Introduction to Group Chemistry** **CONTINUOUS ASSESSMENT**  **ASSIGNMENT**  **Deadline: 3.00 pm Friday 9th August**  Work Submitted after the deadline will lose the punctuality bonus  Work submitted after the publication of the mark scheme will not be marked  Photocopied work will not be marked, even if it has been written over manually This cover sheet must be handed in as the front page of your assignment Name: ……………………………………………………  Adm/Reg No. ………………..    Unit 1 Continuous Assessment is worth 15% of the total marks for CHEM 122  Your score will be divided into three parts:  Lecture and Tutorial Attendance 10%  Assignment 40%  Test 50% |

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| **1.** | (a) | Describe and explain how atomic radius changes across a period. |
|  | (b) | Describe and explain how atomic radium changes down a group.  [5] |
| **2.** | (a) | Define the term electronegativity. |
|  | (b) | Explain why the elements in Groups 1 and 2 of the Periodic Table are all metals but the elements in Group 7 of the Periodic Table are all non-metals.  [5] |
| **3.** | (a) | Using ideas about electronegativity, explain why the bonding in AlF3 is ionic but the bonding in AlCl3 is covalent. |
|  | (b) | Using ideas about polarizing power, explain why the bonding in LiCl is ionic but the bonding in BeCl2 is covalent.  [5] |
| **4.** | (a) | Write an equation, including state symbols, for the reaction of sodium with water. Explain three observations you would observe during this reaction. |
|  | (b) | State and explain how the reaction of potassium with water may differ from the reaction of sodium with water.  [5] |
| **5.** | (a) | Explain, with the aid of an equation, why barium reacts with hydrochloric acid more rapidly than magnesium does. |
|  | (b) | Explain, with the aid of an equation, why magnesium reacts with sulphuric acid more rapidly than barium does.  [5] |
| **6.** | (a) | State and explain the trend in the solubility of the hydroxides and the sulphates of Group 2. |
|  | (b) | Give two examples of how the differences in solubility of the hydroxides and sulphates of Group 2 is useful in qualitative analysis.  [5] |
| **7.** | Give two examples, using equations where appropriate, to show the anomalous behaviour of: | |
|  | (a) | Lithium, compared to the other Group 1 metals |
|  | (b) | Beryllium, compared to the other Group 2 metals  [5] |
| **8.** | (a) | Describe the structure and bonding in fluorine, chlorine, bromine and iodine. |
|  | (b) | State and explain the trend in the boiling points of these four elements.  [5] |
| **9.** | State what you would observe, writing equations for any reactions which take place, when bromine water is added to separate solutions of sodium chloride and sodium iodide. Explain any differences in what is observed.  [5] | |