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| **DEPARTMENT OF CHEMISTRY**  **FOURAH BAY COLLEGE – UNIVERSITY OF SIERRA LEONE** CHEM 221P-BLOCK CHEMISTRY AND FURTHER REACTIVITY**Unit 1 – The Chemistry of the p-block** **CONTINUOUS ASSESSMENT**  **ASSIGNMENT**  **Deadline: 3.00 pm Friday 16th 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 221  Your score will be divided into three parts:  Lecture and Tutorial Attendance 10%  Assignment 40%  Test 50% |

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| 1. | (a) | Explain why metallic character decreases across Period 3. |
|  | (b) | Explain why metallic character increases down Group 4.  [5] |
| **2.** | (a) | Explain why AlF3 is ionic but AlCl3 is covalent. |
|  | (b) | Explain why AlF3 is ionic but BF3 is covalent.  [5] |
| **3.** | Describe how aluminium is extracted from bauxite, giving equations where appropriate.  [5] | |
| **4.** | (a) | Describe the structure and bonding in boron trifluoride. |
|  | (b) | Explain, with an example, why BF3 is a good Lewis acid.  [5] |
| **5.** | Describe the structure and bonding in diborane.  [5] | |
| **6.** | (a) | Explain how and why the chemistry of thallium is similar to that of the alkali metals. |
|  | (b) | Suggest why Tl2O is basic but Tl2O3 is amphoteric.  [5] |
| **7.** | Describe the structures of CO2 and SiO2 and explain why they are so different.  [5] | |
| **8.** | (a) | Explain why SiCl4 reacts rapidly with water but CCl4 does not. |
|  | (b) | Explain why Si does not form a structure analogous to graphite.  [5] |
| **9.** | (a) | Explain why PbO2 is a good oxidising agent but SnO2 is not. |
|  | (b) | Write equations for the half-reactions taking place in the lead-acid battery. What do these reactions suggest about the relative stability of the oxidation states in lead?  [5] |