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| **DEPARTMENT OF CHEMISTRY**  **FOURAH BAY COLLEGE – UNIVERSITY OF SIERRA LEONE** CHEM 123ORGANIC CHEMISTRY II – MECHANISMS, AROMATIC AND NATURALLY OCCURRING COMPOUNDS**Unit 1 – Organic Mechanisms** **CONTINUOUS ASSESSMENT**  **TEST**  **8.00 am Wednesday 29th August**  Name: ……………………………………………………  Adm/Reg No. ………………..    Unit 1 Continuous Assessment is worth 15% of the total marks for CHEM 123  Your score will be divided into three parts:  Lecture and Tutorial Attendance 10%  Assignment 40%  Test 50% |

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| **1.** | Propene reacts with bromine to form 1,2-dibromopropane. | |
|  | (a) | Write an equation for this reaction and name the mechanism by which this reaction proceeds.  ………………………………………………………………………………………………………………………………………………………………………..  ……………………………………………………………………………………………………………………………………………………………………….. |
|  | (b) | Outline the mechanism for this reaction.  [5] |
| **2.** | 1-chloropropane reacts with excess ammonia to form 1-aminopropane (propylamine). | |
|  | (a) | Write an equation for this reaction and name the mechanism by which this reaction proceeds.  ………………………………………………………………………………………………………………………………………………………………………..  ……………………………………………………………………………………………………………………………………………………………………….. |
|  | (b) | Outline the mechanism for this reaction. |
|  | (c) | Explain why increasing the concentration of ammonia will increase the rate of this reaction.  ………………………………………………………………………………………………………………………………………………………………………..  ………………………………………………………………………………………………………………………………………………………………………..  ………………………………………………………………………………………………………………………………………………………………………..  [5] |

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| **3.** | 2-bromomethylpropane reacts with hydroxide ions to form methylpropan-2-ol. | |
|  | (a) | Write an equation for this reaction and name the mechanism by which this reaction proceeds.  ………………………………………………………………………………………………………………………………………………………………………..  ……………………………………………………………………………………………………………………………………………………………………….. |
|  | (b) | Outline the mechanism for this reaction. |
|  | (c) | Explain why increasing the concentration of hydroxide ions will not increase the rate of this reaction.  ………………………………………………………………………………………………………………………………………………………………………..  ………………………………………………………………………………………………………………………………………………………………………..  ………………………………………………………………………………………………………………………………………………………………………..  [5] |
| **4.** | 1-chloropropane reacts with hydroxide ions to form propene. | |
|  | (a) | Write an equation for this reaction and state the type of reaction occurring.  ………………………………………………………………………………………………………………………………………………………………………..  ……………………………………………………………………………………………………………………………………………………………………….. |
|  | (b) | Outline the mechanism for this reaction. |
|  | (c) | State the role of the hydroxide ions in this reaction.  ………………………………………………………………………………………………………………………………………………………………………..  [5] |

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| **5.** | Butan-2-ol can be dehydrated to form three different organic products. | |
|  | (a) | Write an equation for the formation of one of the organic products.  ……………………………………………………………………………………………………………………………………………………………………….. |
|  | (b) | Outline the mechanism for this reaction. |
|  | (b) | Draw the structures of the other two organic products.  [5] |
| **6.** | (a) | State and explain how the rate of the reaction in Q2 would change if 2-bromopropane was used instead of 2-chloropropane.  ………………………………………………………………………………………………………………………………………………………………………..  ………………………………………………………………………………………………………………………………………………………………………..  ………………………………………………………………………………………………………………………………………………………………………..  ……………………………………………………………………………………………………………………………………………………………………….. |
|  | (b) | Under different conditions, the reaction in Q3 could produce methylpropene. State the conditions which would help produce methylpropan-2-ol rather than methylpropene in this reaction.  ………………………………………………………………………………………………………………………………………………………………………..  ………………………………………………………………………………………………………………………………………………………………………..  ………………………………………………………………………………………………………………………………………………………………………..  ………………………………………………………………………………………………………………………………………………………………………..  [5] |

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| **7.** | Propane reacts with chlorine to form a number of different products. One of the possible products is 2-chloropropane. | |
|  | (a) | Write an equation for the reaction taking place when propane reacts with chlorine to make 2-chloropropane and name the mechanism by which this reaction proceeds.  ………………………………………………………………………………………………………………………………………………………………………..  ……………………………………………………………………………………………………………………………………………………………………….. |
|  | (b) | Outline the mechanism for this reaction and state a necessary condition for this reaction to take place.  Condition: ……………….…………………………………………………………………………………………………………………………………….. |
|  | (c) | Another product of this reaction is 1,1-dichloropropane. Explain how this product is formed during the reaction.  ………………………………………………………………………………………………………………………………………………………………………..  ………………………………………………………………………………………………………………………………………………………………………..  ………………………………………………………………………………………………………………………………………………………………………..  ……………………………………………………………………………………………………………………………………………………………………….. |
|  | (d) | Another product of this reaction is hexane. Explain how this product is formed during the reaction.  ………………………………………………………………………………………………………………………………………………………………………..  ………………………………………………………………………………………………………………………………………………………………………..  ………………………………………………………………………………………………………………………………………………………………………..  ………………………………………………………………………………………………………………………………………………………………………..  [10] |